Practice: 101 - CNMP Design and Implementation Activity

Scenario: #2 - CNMP Revision

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be revised to address changes in manure management, volume or analysis, plants and crops, or plant and crop management or to adjust the nutrient balance on an Animal Feeding Operation (AFO). No modifications are required to engineered practices in the farmstead/production area. This scenario is where the services of a professional engineer are typically not required. The producer may export a portion of manure or organic products from the farm. The producer has an animal production area and land applies nutrients.

Before Situation:

The owner/operator of an AFO has an existing written Comprehensive Nutrient Management Plan (CNMP) that addresses the current required resource concerns and client objectives present on the facility production area and land application areas. The CNMP is

After Situation:

Utilize a certified Technical Service Provider (TSP) to update the nutrient management plan and design planned agronomic conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additional applicable criteria found in each conservation practice. Design all agronomic conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Use CEMA 226 and CEMA 227 if site feasibility and evaluation of existing storages are needed.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,861.74

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,861.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #18 - All Livestock Operations, No Land Application

Scenario Description:

Animal Feeding Operation (AFO) without land application. Use only if CEMA 226 is needed. The producer exports (material transferred to another owner with written documentation of the transfer) manure or organic products from the farm. The operation has an animal production area. Select applicable CPA 102 component for a complete CNMP

Before Situation:

Currently the production area does not meet NRCS quality criteria for water quality and soil erosion. Manure not frequently tested. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems

After Situation:

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling and storage of animal waste in an environmentally safe manner. Design and implementation will meet the general and additional applicable criteria found in each conservation practice. Use only if CEMA 226 is needed. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,115.38

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,115.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #34 - All Livestock Operations, Less Than or Equal to 300 Animal Units

Scenario Description:

All Animal Feeding Operation (AFO) currently less than 300 animal units (AU). The producer may export (material transferred to another owner with written documentation of the transfer) a portion of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). Select applicable CPA 102 component for a complete CNMP.

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

After Situation:

Utilize a certified Technical Service Provider (TSP) to complete a nutrient management plan and implementation specifications for conservation practices treating resource concerns and the application of animal waste in an environmentally safe manner on the production and land treatment areas. Design and implementation will meet the general and additional applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Complete Implementation Requirements or Job Sheets for all agronomic conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients and treat identified resource concerns. Use CEMA 226 and CEMA 227 if site feasibility and evaluation of existing storages are needed.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,635.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,635.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #66 - All Livestock Operations, 301 to 700 Animal Units

Scenario Description:

All Animal Feeding Operation (AFO) currently greater than 300 animal units (AU) and less than 700 AU with land application. The producer may export (material transferred to another owner with written documentation of the transfer) a portion of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). Select applicable CPA 102 component for a complete CNMP.

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

After Situation:

Utilize a certified Technical Service Provider (TSP) to complete nutrient management plan and implementation specifications for conservation practices treating resource concerns and the application of animal waste in an environmentally safe manner on the production and land treatment areas. Design and implementation will meet the general and additional applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Complete Implementation Requirements or Job Sheets for all agronomic conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients and treat identified resource concerns. Use CEMA 226 and CEMA 227 if site feasibility and evaluation of existing storages are needed.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,929.72

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,929.72

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #98 - All Livestock Operations, Greater Than 700 Animal Units

Scenario Description:

All Animal Feeding Operation (AFO) currently greater than 700 animal units (AU) with land application. The producer may export (material transferred to another owner with written documentation of the transfer) a portion of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). Select applicable CPA 102 component for a complete CNMP.

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

After Situation:

Utilize a certified Technical Service Provider (TSP) to complete a nutrient management plan and implementation specifications for conservation practices treating resource concerns and the application of animal waste in an environmentally safe manner on the production of land treatment areas. Design and implementation will meet the general and additional applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Complete Implementation Requirements or Job Sheets for all agronomic conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients and treat identified resource concerns. Use CEMA 226 and CEMA 227 if site feasibility and evaluation of existing storages are needed.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $9,295.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9,295.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #348 - Dairy Operations, 301 to 700 Animal Units

Scenario Description:

Dairy Animal Feeding Operation (AFO) greater than 300 but less than 700 animal units (AU) animal units (AU). The producer utilizes manure or organic products from the farm and may export a portion. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). Use CEMA 226/227 if site evaluation and evaluation of existing components are needed. Select applicable DIA 101 component for a complete CNMP.

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land a

After Situation:

Utilize a CNMP Certified Technical Service Provider (TSP) to plan conservation practices that address the handling and storage of animal waste in an environmentally safe manner. CPA 102 - CNMP identifies the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Production, collection, transfer, treatment, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,864.25

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,864.25

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #364 - Dairy Operations, Less Than or Equal to 300 Animal Units

Scenario Description:

Dairy Animal Feeding Operation (AFO) currently is less than 300 animal units (AU). The producer utilizes manure or organic products from the farm and may export a portion. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). Use CEMA 226/227 if site evaluation and evaluation of existing components are needed. Select applicable DIA 101 component for a complete CNMP.

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land a

After Situation:

Utilize a CNMP Certified Technical Service Provider (TSP) to plan conservation practices that address the handling and storage of animal waste in an environmentally safe manner. CPA 102 - CNMP identifies the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Production, collection, transfer, treatment, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,579.15

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,579.15

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #380 - Dairy Operations, No Land Application

Scenario Description:

Dairy Feeding Operation (AFO). The producer exports (material transferred to another owner with written documentation of the transfer) all manure or organic products from the farm. The operation has an animal production area only. There is no land treatment section, this plan would cover production only. Use CEMA 226/227 if site evaluation and evaluation of existing components are needed. Export only Plan, DIA 101 should not be used unless a CEMA 226 is needed.

Before Situation:

Currently the production area does not meet NRCS quality criteria for water quality. Manure or Organic products are not frequently tested. The production area does not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a

After Situation:

Utilize a CNMP certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and transfer of animal waste in an environmentally safe manner. CPA 102 -CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area. Production, collection, transfer, treatment, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,837.06

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,837.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #396 - Non-Dairy Livestock Operations, No Land Application

Scenario Description:

Animal Feeding Operation (AFO). The producer exports (material transferred to another owner with written documentation of the transfer) all manure or organic products from the farm. The operation has an animal production area only. There is no land treatment section, this plan would cover production only. Use CEMA 227 for evaluation of existing components, if needed. Export only Plan, DIA 101 should not be used unless CEMA 226 is needed.

Before Situation:

Currently the production area does not meet NRCS quality criteria for water quality. Manure or Organic products are not frequently tested. The production area does not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a

After Situation:

Utilize a CNMP certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and transfer of animal waste in an environmentally safe manner. CPA 102 -CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area. Production, collection, transfer, treatment, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,606.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,606.30

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #412 - Non-Dairy Operations, Greater Than 700 Animal Units

Scenario Description:

Animal Feeding Operation (AFO) currently is greater than 700 animal units (AU). The producer utilizes manure or organic products from the farm and may export a portion. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). Use CEMA 226/227 if site evaluation and evaluation of existing components are needed. Select applicable DIA 101 component for a complete CNMP.

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land a

After Situation:

Utilize a CNMP Certified Technical Service Provider (TSP) to plan conservation practices that address the handling and storage of animal waste in an environmentally safe manner. CPA 102 - CNMP identifies the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Production, collection, transfer, treatment, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,726.18

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,726.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #428 - Non-Dairy Livestock Operations, 301 to 700 Animal Units

Scenario Description:

Animal Feeding Operation (AFO) currently is greater than 300 but less than 700 animal units (AU). The producer utilizes manure or organic products from the farm and may export a portion. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). Use CEMA 226/227 if site evaluation and evaluation of existing components are needed. Select applicable DIA 101 component for a complete CNMP.

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land a

After Situation:

Utilize a CNMP Certified Technical Service Provider (TSP) to plan conservation practices that address the handling and storage of animal waste in an environmentally safe manner. CPA 102 - CNMP identifies the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Production, collection, transfer, treatment, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,011.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,011.24

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #444 - Non-Dairy Livestock Operations, Less Than or Equal to 300 Animal Units

Scenario Description:

Animal Feeding Operation (AFO) currently is less than 300 animal units (AU). The producer utilizes manure or organic products from the farm and may export a portion. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). Use CEMA 226/227 if site evaluation and evaluation of existing components are needed. Select applicable DIA 101 component for a complete CNMP.

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land a

After Situation:

Utilize a CNMP Certified Technical Service Provider (TSP) to plan conservation practices that address the handling and storage of animal waste in an environmentally safe manner. CPA 102 - CNMP identifies the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Production, collection, transfer, treatment, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,551.97

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,551.97

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #460 - Dairy Operations, Greater Than 700 Animal Units

Scenario Description:

Dairy Animal Feeding Operation (AFO) greater than 700 animal units (AU). The producer utilizes manure or organic products from the farm and may export a portion. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). Use CEMA 226/227 if site evaluation and evaluation of existing components are needed. Select applicable DIA 101 component for a complete CNMP.

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land a

After Situation:

Utilize a CNMP Certified Technical Service Provider (TSP) to plan conservation practices that address the handling and storage of animal waste in an environmentally safe manner. CPA 102 - CNMP identifies the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Production, collection, transfer, treatment, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,579.20

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8,579.20

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 106 - Forest Management Plan

Scenario: #14 - Nonindustrial Private Forest, Less Than or Equal to 20 Acres

Scenario Description:

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 1 to 20 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as de

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,610.05

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,610.05

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 106 - Forest Management Plan

Scenario: #15 - Nonindustrial Private Forest, 21 to 100 Acres

Scenario Description:

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 21 to 100 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as de

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,372.71

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,372.71

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 106 - Forest Management Plan

Scenario: #16 - Nonindustrial Private Forest, 101 to 250 Acres

Scenario Description:

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 101 to 250 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as de

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,898.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,898.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 106 - Forest Management Plan

Scenario: #17 - Nonindustrial Private Forest, 251 to 500 Acres

Scenario Description:

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 251 to 500 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as de

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CPA). The CPA requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan requirements are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,762.28

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,762.28

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 106 - Forest Management Plan

Scenario: #18 - Nonindustrial Private Forest, 501 to 1,000 Acres

Scenario Description:

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 501 to 1000 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as de

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,033.38

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,033.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 106 - Forest Management Plan

Scenario: #19 - Nonindustrial Private Forest, Greater Than 1,000 Acres

Scenario Description:

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 1001 acres or greater in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as de

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $9,151.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9,151.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 110 - Grazing Management Plan

Scenario: #68 - Grazed Lands, 101 to 500 Acres

Scenario Description:

Site specific conservation plan for grazed lands for an agricultural operation with 101 to 500 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferred Alternative).

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,141.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,141.79

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 110 - Grazing Management Plan

Scenario: #84 - Grazed Lands, Less Than or Equal to 100 Acres

Scenario Description:

Site specific conservation plan for agricultural operation with less than 100 acres grazed land. The plan will address the following natural resource concerns: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,513.43

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,513.43

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 110 - Grazing Management Plan

Scenario: #100 - Grazed Lands, 501 to 1,500 Acres

Scenario Description:

Site specific conservation plan for grazed lands for an agricultural operation with 501 to 1,500 acres of grazed land. The plan will address the following natural resource concerns: soil erosion, water quality, fish and wildlife, plant condition and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,770.14

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,770.14

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 110 - Grazing Management Plan

Scenario: #116 - Grazed Lands, 1,501 to 5,000 Acres

Scenario Description:

Site specific conservation plan for grazed lands for an agricultural operation with 1,501 to 5,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,398.50

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,398.50

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 110 - Grazing Management Plan

Scenario: #132 - Grazed Lands, 5,001 to 10,000 Acres

Scenario Description:

Site specific conservation plan for grazed lands for an agricultural operation with 5,001 to 10,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,026.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,026.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 110 - Grazing Management Plan

Scenario: #148 - Grazed Lands, Greater Than 10,000 Acres

Scenario Description:

Site specific conservation plan for grazed lands for an agricultural operation with greater than 10,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,655.22

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,655.22

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 116 - Soil Health Management Plan

Scenario: #82 - Organic Crops and Livestock Soil Health Management, Less Than Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for organic crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,922.99

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,922.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 116 - Soil Health Management Plan

Scenario: #98 - Organic Crops Soil Health Management, Greater Than or Equal to Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for organic crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,751.05

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,751.05

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 116 - Soil Health Management Plan

Scenario: #114 - Small Farm, Less Than or Equal to 10 Acres

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for a small farm (<10 acres).

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,719.41

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,719.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 116 - Soil Health Management Plan

Scenario: #130 - Organic Crops and Livestock Soil Health Management, Greater Than or Equal to Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for organic crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,094.93

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,094.93

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 116 - Soil Health Management Plan

Scenario: #146 - Crops and Livestock Soil Health Management, Greater Than or Equal to Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,579.11

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,579.11

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 116 - Soil Health Management Plan

Scenario: #162 - Crops and Livestock Soil Health Management, Less Than Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,063.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,063.29

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 116 - Soil Health Management Plan

Scenario: #178 - Organic Crops Soil Health Management, Less Than Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for organic crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,235.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,235.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 116 - Soil Health Management Plan

Scenario: #194 - Crops Soil Health Management, Greater Than or Equal to Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,407.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,407.17

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 116 - Soil Health Management Plan

Scenario: #210 - Crops Soil Health Management, Less Than Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,891.35

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,891.35

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 120 - Agricultural Energy Design

Scenario: #2 - High Complexity, Greater Than or Equal to Six Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr., lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, “6+ Designs” shall be contracted for the Ag Energy DIA. Use this scenario if at least one design is deemed high complexity. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using th

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $11,068.11

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11,068.11

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 120 - Agricultural Energy Design

Scenario: #18 - Medium Complexity, Greater Than or Equal to Six Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr., lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, “6+ Designs” shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using th

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $9,553.51

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9,553.51

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 120 - Agricultural Energy Design

Scenario: #34 - Low Complexity, Greater Than or Equal to Six Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a “Low Complexity” system, as follows. 1) New devices maintain output (hp, Btu/hr., lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. “Low Complexity” practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, “6+ Designs” shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using th

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,038.92

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8,038.92

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 120 - Agricultural Energy Design

Scenario: #50 - High Complexity, Four to Five Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr., lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, “4-5 Designs” shall be contracted for the Ag Energy DIA. Use this scenario if at least one design is deemed high complexity. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using th

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $9,407.48

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9,407.48

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 120 - Agricultural Energy Design

Scenario: #66 - Medium Complexity, Four to Five Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr., lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, “4-5 Designs” shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using th

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,892.89

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,892.89

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 120 - Agricultural Energy Design

Scenario: #82 - Low Complexity, Four to Five Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a “Low Complexity” system, as follows. 1) New devices maintain output (hp, Btu/hr., lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. “Low Complexity” practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, “4-5 Designs” shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using th

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,378.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,378.29

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 120 - Agricultural Energy Design

Scenario: #98 - High Complexity, Two to Three Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr., lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, “2-3 Designs” shall be contracted for the Ag Energy DIA. Use this scenario if at least one design is deemed high complexity. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using th

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,746.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,746.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 120 - Agricultural Energy Design

Scenario: #114 - Medium Complexity, Two to Three Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr., lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, “2-3 Designs” shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using th

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,232.26

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,232.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 120 - Agricultural Energy Design

Scenario: #130 - Low Complexity, Two to Three Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a “Low Complexity” system, as follows. 1) New devices maintain output (hp, Btu/hr., lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. “Low Complexity” practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, “2-3 Designs” shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using th

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,717.66

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,717.66

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 120 - Agricultural Energy Design

Scenario: #146 - High Complexity, One Design

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr., lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. “One Design” indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using th

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,086.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,086.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 120 - Agricultural Energy Design

Scenario: #162 - Medium Complexity, One Design

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a "Medium Complexity" system, as follows. 1) Client objectives require a change of output (hp, Btu/hr., lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) "Medium Complexity" practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). "One Design" indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client's final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using th

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client's decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,571.63

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,571.63

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 120 - Agricultural Energy Design

Scenario: #178 - Low Complexity, One Design

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a “Low Complexity” system, as follows. 1) New devices maintain output (hp, Btu/hr., lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. “Low Complexity” practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. “One Design” indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using th

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,057.04

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,057.04

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #4 - Supporting Organic Transition for Crops and Livestock

Scenario Description:

Agricultural operation where producer will transition from conventional to organic to meet USDA National Organic Program (NOP) requirements. Natural Resource Concern: Soil Erosion, Water Quality, Plant Condition, and other identified natural resource concerns.

Before Situation:

Agricultural operation currently managed using traditional and conventional methods for farming and/or ranching mixed operation of crops and livestock. The producer currently manages the operation based upon personal knowledge, or other local criteria. Th

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Conservation Plan Supporting Organic Transition Conservation Activity Plan (CAP) The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement a system of conservation practices which assist the producer to transition from conventional farming or ranching to an organic production system with crops and livestock. The CAP plan will include conservation practices which address related resource concerns. The CAP meets the basic quality criteria for the 138 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,447.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,447.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #34 - Transition to Organic for Crop, Low Complexity

Scenario Description:

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic production systems. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

Before Situation:

Current crops and rotation, farming practices (tillage, nutrient application methods, timing, source, and rate), soils, and equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of chang

After Situation:

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,588.07

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,588.07

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #50 - Transition to Organic for Crop, High Complexity

Scenario Description:

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic production systems. Crop production system is more complex based on site features, large acreage, specialty crops, irrigation, orchard and vineyards. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

Before Situation:

Current crops and rotation, farming practices (tillage, nutrient application methods, timing, source, and rate), soils, and equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of chang

After Situation:

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,447.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,447.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #66 - Transition to Organic for Livestock, Low Complexity

Scenario Description:

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic livestock systems. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

Before Situation:

Current livestock production, housing, feed, equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of changes to the current system are not known and new resource concerns may emerge.

After Situation:

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,017.92

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,017.92

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #82 - Transition to Organic for Livestock, High Complexity

Scenario Description:

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic livestock systems. System is high complexity based on conditions such as large Animal Units, multiple production locations, age segregation and similar management. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

Before Situation:

Current livestock production, housing, feed, equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of changes to the current system are not known and new resource concerns may emerge.

After Situation:

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $9,015.74

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9,015.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #98 - Transition to Organic for Crop and Livestock, Low Complexity

Scenario Description:

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic crop and livestock production systems. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

Before Situation:

Current crops and rotation, livestock management and feeding, farming practices (tillage, nutrient application methods, timing, source, and rate), soils, and equipment and technology utilized are not considered as Organic. The producer objectives are to b

After Situation:

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,447.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,447.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #114 - Transition to Organic for Crop and Livestock, High Complexity

Scenario Description:

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic crop and livestock production systems. Increased crop acreage, irrigation, specialty crops, orchards and vineyards, large AUs, age segregation management add complexity to the system. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

Before Situation:

Current crops and rotation, livestock management and feeding, farming practices (tillage, nutrient application methods, timing, source, and rate), soils, and equipment and technology utilized are not considered as Organic. The producer objectives are to b

After Situation:

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $9,445.59

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9,445.59

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 140 - Transition to Organic Design

Scenario: #2 - Low Complexity Conservation Practices, One to Four

Scenario Description:

Agricultural operation where producer will transition from conventional production to organic production. They will meet the USDA National Organic Program (NOP) requirements. All Natural resources will be addressed: Soil, Water, Air, Plants and Animals. Will address resource concerns with 1 - 4, low complexity conservation practices.

Before Situation:

Agricultural operation currently managed using conventional agricultural production methods. Producer will transition all or part of the farm operation to meet national USDA NOP requirements for organic certification. The producer will collaborate with a

After Situation:

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. All practices installed according to field office technical guide requirements. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,962.45

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,962.45

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 140 - Transition to Organic Design

Scenario: #18 - Low Complexity Conservation Practices, Greater Than or Equal to Five

Scenario Description:

Agricultural operation where producer will transition from conventional production to organic production. They will meet the USDA National Organic Program (NOP) requirements. All Natural resources will be addressed: Soil, Water, Air, Plants and Animals. Will address resources concerns with 5 or more conservation practices with low complexity.

Before Situation:

Agricultural operation currently managed using conventional agricultural production methods. Producer will transition all or part of the farm operation to meet national USDA NOP requirements for organic certification. The producer will collaborate with a

After Situation:

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. All practices installed according to field office technical guide requirements. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $9,856.38

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9,856.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 140 - Transition to Organic Design

Scenario: #34 - High Complexity Conservation Practices, One to Four

Scenario Description:

Agricultural operation where producer will transition from conventional production to organic production. They will meet the USDA National Organic Program (NOP) requirements. All Natural resources will be addressed: Soil, Water, Air, Plants, and Animals. Will address resource concerns with 1 - 4, high complexity conservation practices.

Before Situation:

Agricultural operation currently managed using conventional agricultural production methods. Producer will transition all or part of the farm operation to meet national USDA NOP requirements for organic certification. The producer will collaborate with a

After Situation:

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. All practices installed according to field office technical guide requirements. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $12,752.61

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12,752.61

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 140 - Transition to Organic Design

Scenario: #50 - High Complexity Conservation Practices, Greater Than or Equal to Five

Scenario Description:

Agricultural operation where producer will transition from conventional production to organic production. They will meet the USDA National Organic Program (NOP) requirements. All Natural resources will be addressed: Soil, Water, Air, Plants and Animals. Will address resource concerns with 5 or more, high complexity conservation practices.

Before Situation:

Agricultural operation currently managed using conventional agricultural production methods. Producer will transition all or part of the farm operation to meet national USDA NOP requirements for organic certification. The producer will collaborate with a

After Situation:

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. All practices installed according to field office technical guide requirements. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $16,436.72

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $16,436.72

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 144 - Fish and Wildlife Habitat Design

Scenario: #2 - Habitat Design, One Land Use

Scenario Description:

Various on-farm land uses. Natural Resource Concerns: Terrestrial Habitat and/or Aquatic Habitat on an agricultural operation. The Fish and Wildlife Habitat Design and Implementation Activity (DIA) addresses fish and wildlife habitat management relative to only one land use on the agricultural operation.

Before Situation:

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is

After Situation:

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Habitat DIA. The DIA criteria require the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The DIA may include recommendations for associated conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 144 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Design & Implementation Pl

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,277.99

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,277.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 144 - Fish and Wildlife Habitat Design

Scenario: #18 - Habitat Design, Two Land Uses

Scenario Description:

Various on-farm land uses. Natural Resource Concerns: Terrestrial Habitat and/or Aquatic Habitat on an agricultural operation. The Fish and Wildlife Habitat Design and Implementation Activity (DIA) addresses fish and wildlife habitat management relative to two land uses on the agricultural operation of which each land use is at least 20 acres in size.

Before Situation:

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is

After Situation:

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Habitat DIA. The DIA criteria require the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The DIA may include recommendations for associated conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 144 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Fish and Wildlife Habitat DI

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,006.43

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,006.43

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 144 - Fish and Wildlife Habitat Design

Scenario: #34 - Habitat Design, Three or More Land Uses

Scenario Description:

Various on-farm land uses. Natural Resource Concerns: Terrestrial Habitat and/or Aquatic Habitat on an agricultural operation. The Fish and Wildlife Habitat Design and Implementation Activity (DIA) addresses fish and wildlife habitat management relative to three or more land uses on the agricultural operation of which at least three of the land uses are at least 20 acres in size.

Before Situation:

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is

After Situation:

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Habitat DIA. The DIA criteria require the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The DIA may include recommendations for associated conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 144 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Fish and Wildlife Habitat DI

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,734.88

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,734.88

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 148 - Pollinator Habitat Design

Scenario: #2 - Pollinator Habitat, No Local TSP

Scenario Description:

Various on-farm land uses, No qualified TSP within 300 miles. Natural Resource Concern: Fish and Wildlife, Plant Condition, Soil Erosion, Water Quality on an agricultural operation.

Before Situation:

Agricultural producer currently has no plan or knowledge of development or management of pollinator habitat. The producer does not currently manage or enhance habitat to promote opportunities for pollinator habitat. Within existing land uses, the producer

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Pollinator Habitat Enhancement Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to improve, restore, or enhance flower-rich habitat that supports native and/or managed pollinator species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 146 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,554.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,554.37

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 148 - Pollinator Habitat Design

Scenario: #18 - Pollinator Habitat

Scenario Description:

Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, Plant Condition, Soil Erosion, Water Quality on an agricultural operation.

Before Situation:

Agricultural producer currently has no plan or knowledge of development or management of pollinator habitat. The producer does not currently manage or enhance habitat to promote opportunities for pollinator habitat. Within existing land uses, the producer

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Pollinator Habitat Enhancement Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to improve, restore, or enhance flower-rich habitat that supports native and/or managed pollinator species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 146 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,824.32

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,824.32

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 157 - Nutrient Management Design and Implementation Activity

Scenario: #2 - Nutrient Management, 101 to 300 Acres Fertilizer and Manure

Scenario Description:

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns. Manure may be imported.

Before Situation:

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nut

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,759.71

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,759.71

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 157 - Nutrient Management Design and Implementation Activity

Scenario: #18 - Nutrient Management, 101 to 300 Acres and No Manure

Scenario Description:

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nut

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,434.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,434.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 157 - Nutrient Management Design and Implementation Activity

Scenario: #34 - Nutrient Management, Greater Than 300 Acres and No Manure

Scenario Description:

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nut

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,542.65

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,542.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 157 - Nutrient Management Design and Implementation Activity

Scenario: #50 - Nutrient Management, Less Than or Equal to 100 Acres Fertilizer and Manure

Scenario Description:

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns. Manure may be imported.

Before Situation:

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nut

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,542.65

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,542.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 157 - Nutrient Management Design and Implementation Activity

Scenario: #66 - Nutrient Management, Less Than or Equal to 100 Acres and No Manure

Scenario Description:

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nut

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,325.59

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,325.59

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 157 - Nutrient Management Design and Implementation Activity

Scenario: #82 - Nutrient Management, Greater Than 300 Acres Fertilizer and Manure

Scenario Description:

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns. Manure may be imported.

Before Situation:

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nut

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $9,422.51

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9,422.51

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 158 - Feed Management Design

Scenario: #2 - Feed Management Plan

Scenario Description:

The owner/operator of an Animal Feeding Operation (AFO) has not received a written Feed Management Plan that addresses all resource concerns present on the facility. Various levels of management and conservation implementation has occurred in the operation. Little documentation of the methods of feed management used and practices installed exists, and the producer is not likely to developed a complete forage inventory or nutrient analysis. The producer may or may not have a conservation plan or a nutrient management plan. Nutrient management related resource concerns on the operation remain to be addressed through the development of a complete activity plan including management and conservation practices for proper quantity and quality of available nutrients, feedstuffs, and/or additives fed to livestock or poultry that may be present on the operation. Present operation and feed methodology poses risk of feeding excessive amounts of nutrients in animal manure which result in negative impacts to water quality and odor resource concerns. Negative water and air quality impacts as well as farmstead safety and security issues may remain on the AFO, and inadequate record-keeping nutrient, inspection and monitoring of the existing operation may need further improvement.

Before Situation:

Producer does not have a plan or has limited knowledge of management of feed, nutrients, feedstuffs, or nutritional additives provided to domestic livestock and poultry. The producer currently manages feed without a plan which would address livestock prod

After Situation:

Participant has obtained services from a certified TSP for development of the Feed Management plan (CAP). The criteria requires the plan to meet quality criteria for applicable natural resource concerns and provides for opportunities to identify and implement conservation practices related to management of feed, forages, or delivery of supplements to maximize efficient feeding operations and livestock growth. The plan may serve as the basis for implementation of the primary conservation practice 592 - Feed Management. If applicable, the plan may also be developed to complement Comprehensive Nutrient Management Plans (CNMP) or to help meet requirements of NRCS practice standard 590 - Nutrient Management. The plan may include recommendations for addressing associated natural resource concerns with other conservation practices.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,434.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,434.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 159 - Grazing Management Design

Scenario: #98 - Grazed Lands, Less Than or Equal to 100 Acres

Scenario Description:

Design and implementation activities for agricultural operation with less than 100 acres grazed land. The following natural resource concerns will be addressed: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identifie

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resource concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,675.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,675.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 159 - Grazing Management Design

Scenario: #114 - Grazed Lands, 101 to 500 Acres

Scenario Description:

Design and implementation activities for an agricultural operation with 101 to 500 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identifie

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resource concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,094.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,094.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 159 - Grazing Management Design

Scenario: #130 - Grazed Lands, 501 to 1,500 Acres

Scenario Description:

Design and implementation activities for agricultural operation with 501 to 1,500 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identifie

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resource concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,513.43

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,513.43

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 159 - Grazing Management Design

Scenario: #146 - Grazed Lands, 1,501 to 5,000 Acres

Scenario Description:

Design and implementation activity for an agricultural operation with 1,501 to 5,000 acres grazed land. The following natural resource concerns will be addressed: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identifie

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resource concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,932.33

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,932.33

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 159 - Grazing Management Design

Scenario: #162 - Grazed Lands, 5,001 to 10,000 Acres

Scenario Description:

Design and implementation activities for an agricultural operation with 5,001 to 10,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identifie

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resource concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,351.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,351.24

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 159 - Grazing Management Design

Scenario: #178 - Grazed Lands, Greater Than 10,000 Acres

Scenario Description:

Design and implementation activities for an agricultural operation with greater than 10,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identifie

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resource concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,770.14

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,770.14

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 160 - Prescribed Burning Design

Scenario: #2 - Burn Implementation, Less Than or Equal to 20 Acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically less than or equal to 20 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,271.09

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,271.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 160 - Prescribed Burning Design

Scenario: #18 - Burn Implementation, Greater Than 1,000 Acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 1,000 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan (DIA). The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,084.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,084.37

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 160 - Prescribed Burning Design

Scenario: #34 - Burn Implementation, 501 to 1,000 Acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 501 acres and less than 1,000 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,389.58

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,389.58

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 160 - Prescribed Burning Design

Scenario: #50 - Burn Implementation, 251 to 500 Acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 251 acres and less than 500 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan or DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,542.18

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,542.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 160 - Prescribed Burning Design

Scenario: #66 - Burn Implementation, 101 to 250 Acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically greater that 101 acres in size and less than 250 acres and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,118.49

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,118.49

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 160 - Prescribed Burning Design

Scenario: #82 - Burn Implementation, 21 to 100 Acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 21 acres and less than 100 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan or DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,694.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,694.79

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 161 - Pest Management Conservation System Design

Scenario: #2 - High Complexity Conservation Practices, Greater Than or Equal to Five

Scenario Description:

Agricultural operation where producer will implement high complexity conservation practices and PAMS activities as part of an overall Pest Management Conservation System. Natural resources relating to CPS 595 Pest Management Conservation System will be addressed. Will address resource concerns with 5 or more, high complexity conservation practices and/or PAMS activities.

Before Situation:

Agricultural operation currently managed using few pest management strategies. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices and PAMS activities t

After Situation:

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to address resource concerns. All practices installed according to field office technical guide requirements. PAMS activities according to IPM plan and Land Grant University guidelines. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,510.65

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8,510.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 161 - Pest Management Conservation System Design

Scenario: #18 - High Complexity Conservation Practices, One to Four

Scenario Description:

Agricultural operation where producer will implement high complexity conservation practices and PAMS activities as part of an overall Pest Management Conservation System. Natural resources relating to CPS 595 Pest Management Conservation System will be addressed. Will address resource concerns with 1 - 4, high complexity conservation practices and/or PAMS activities.

Before Situation:

Agricultural operation currently managed using few pest management strategies. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices and PAMS activities t

After Situation:

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to address resource concerns. All practices installed according to field office technical guide requirements. PAMS activities according to IPM plan and Land Grant University guidelines. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,901.80

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,901.80

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 161 - Pest Management Conservation System Design

Scenario: #34 - Low Complexity Conservation Practices, Greater Than or Equal to Five

Scenario Description:

Agricultural operation where producer will implement low complexity conservation practices and PAMS activities as part of an overall Pest Management Conservation System. Natural resources relating to CPS 595 Pest Management Conservation System will be addressed. Will address resource concerns with 5 or more, low complexity conservation practices.

Before Situation:

Agricultural operation currently managed using few pest management strategies. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices and PAMS activities t

After Situation:

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to address resource concerns. All practices installed according to field office technical guide requirements. PAMS activities according to IPM plan and Land Grant University guidelines. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,860.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,860.81

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 161 - Pest Management Conservation System Design

Scenario: #50 - Low Complexity Conservation Practices, One to Four

Scenario Description:

Agricultural operation where producer will implement low complexity conservation practices and PAMS activities as part of an overall Pest Management Conservation System. Natural resources relating to CPS 595 Pest Management Conservation System will be addressed. Will address resource concerns with 1 - 4, low complexity conservation practices.

Before Situation:

Agricultural operation currently managed using few pest management strategies. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices and PAMS activities t

After Situation:

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to address resource concerns. All practices installed according to field office technical guide requirements. PAMS activities according to IPM plan and Land Grant University guidelines. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,251.96

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,251.96

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 162 - Soil Health Management System Design

Scenario: #2 - Organic Crops and Livestock Soil Health Management, Less Than Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for up to 5 Soil Health Management Units (SHMU) for organic crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU and can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has collabor

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,094.59

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,094.59

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 162 - Soil Health Management System Design

Scenario: #18 - Crops Soil Health Management, Greater Than or Equal to Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for more than 5 Soil Health Management Units (SHMU) for crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a writte

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,099.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,099.24

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 162 - Soil Health Management System Design

Scenario: #34 - Crops and Livestock Soil Health Management, Greater Than or Equal to Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a writte

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,542.65

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,542.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 162 - Soil Health Management System Design

Scenario: #50 - Small Farm, Less Than or Equal to 10 Acres

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for a small farm operation of less than 10 acres.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has collabor

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,325.59

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,325.59

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 162 - Soil Health Management System Design

Scenario: #66 - Crops Soil Health Management, Less Than Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU and can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has collabor

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,212.41

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,212.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 162 - Soil Health Management System Design

Scenario: #82 - Organic Crops Soil Health Management, Less Than Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for organic crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU and can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has collabor

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,877.53

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,877.53

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 162 - Soil Health Management System Design

Scenario: #98 - Crops and Livestock Soil Health Management, Less Than Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a writte

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,434.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,434.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 162 - Soil Health Management System Design

Scenario: #114 - Organic Crops Soil Health Management, Greater Than or Equal to Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for organic crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a writte

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,651.18

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,651.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 162 - Soil Health Management System Design

Scenario: #130 - Organic Crops and Livestock Soil Health Management, Greater Than or Equal to Five Units

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for organic crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a writte

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,868.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8,868.24

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 163 - Irrigation Water Management Design

Scenario: #2 - Designs without Pump Test, One to Two

Scenario Description:

An agricultural producer wishes to address irrigation water use inefficiency and all other appropriate resource concerns through an EQIP contract with at least one (1) irrigation practice scenario. The pump for the irrigation system is of known performance and less then 3 years old. Each "Design" indicates that new devices or components is closely related to other devices or components of the irrigation water management system even if numerous practices are contracted. The Irrigation Water Management DIA includes reviewing, and when needed, revising alternatives to address the identified concern(s). The Irrigation Water Management DIA documents: a) the client's final decisions related to the associated irrigation practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Insufficient Water - Inefficient Irrigation Water Use; Water Quality Degradation - Excessive sediment in surface waters, Nutrients transported to surface and groundwater, pesticides transported to surface and groundwater, pathogens and chemicals from manure, and biosolids or compost applications transported to surface and groundwater, excess salts in surface and groundwater; Degraded Plant Condition - Undesirable plant productivity and health; Inefficient Energy Use - Equipment and facilities.

Before Situation:

Producer wants to improve irrigation water management on their agricultural operation to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. Producer intends to work with a certified TSP to

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Irrigation Water Management DIA. The DIA 163 criteria include tasks needed to document the client's decisions and design of conservation practices which address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use. The Irrigation Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,018.72

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,018.72

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 163 - Irrigation Water Management Design

Scenario: #18 - Designs without Pump Test, Greater Than or Equal to Three

Scenario Description:

An agricultural producer wishes to address irrigation water use inefficiency and all other appropriate resource concerns through an EQIP contract with multiple irrigation practice scenario. The pump for the irrigation system is of known performance and less then 3 years old. Each "Design" indicates that new devices or components is closely related to other devices or components of the irrigation water management system even if numerous practices are contracted. The Irrigation Water Management DIA includes reviewing, and, when needed, revising alternatives to address the identified concern(s). The Irrigation Water Management DIA documents: a) the client's final decisions related to the associated irrigation practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Insufficient Water - Inefficient Irrigation Water Use; Water Quality Degradation - Excessive sediment in surface waters, Nutrients transported to surface and groundwater, pesticides transported to surface and groundwater, pathogens and chemicals from manure, and biosolids or compost applications transported to surface and groundwater, excess salts in surface and groundwater; Degraded Plant Condition - Undesirable plant productivity and health; Inefficient Energy Use - Equipment and facilities.

Before Situation:

Producer wants to improve irrigation water management on their agricultural operation to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. Producer intends to work with a certified TSP to

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client's decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $11,437.44

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11,437.44

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 163 - Irrigation Water Management Design

Scenario: #34 - Designs with Pump Test, One to Two

Scenario Description:

An agricultural producer wishes to address irrigation water use inefficiency and all other appropriate resource concerns through an EQIP contract with multiple irrigation practice scenario through an EQIP contract with at least one (1) irrigation practice scenario. The pump for the irrigation system is of unknown performance and older than 3 years. Each "Design" indicates that new devices or components is closely related to other devices or components of the irrigation water management system even if numerous practices are contracted. The Irrigation Water Management DIA includes reviewing, and, when needed, revising alternatives to address the identified concern(s). The Irrigation Water Management DIA documents: a) the client's final decisions related to the associated irrigation practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Insufficient Water - Inefficient Irrigation Water Use; Water Quality Degradation - Excessive sediment in surface waters, Nutrients transported to surface and groundwater, pesticides transported to surface and groundwater, pathogens and chemicals from manure, and biosolids or compost applications transported to surface and groundwater, excess salts in surface and groundwater; Degraded Plant Condition - Undesirable plant productivity and health; Inefficient Energy Use - Equipment and facilities.

Before Situation:

Producer wants to improve irrigation water management on their agricultural operation to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. The pump for the irrigation system is of unknown

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Irrigation Water Management DIA. The DIA 163 criteria include tasks needed to document the client's decisions and design of conservation practices which address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use. The Irrigation Water Management DIA meets the quality criteria for the DIA 163 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,354.49

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8,354.49

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 163 - Irrigation Water Management Design

Scenario: #50 - Designs with Pump Test, Greater Than or Equal to Three

Scenario Description:

An agricultural producer wishes to address irrigation water use inefficiency and all other appropriate resource concerns through an EQIP contract with multiple irrigation practice scenario through an EQIP contract with at least one (1) irrigation practice scenario. The pump for the irrigation system is of unknown performance and older than 3 years. Each "Design" indicates that new devices or components is closely related to other devices or components of the irrigation water management system even if numerous practices are contracted. The Irrigation Water Management DIA includes reviewing, and, when needed, revising alternatives to address the identified concern(s). The Irrigation Water Management DIA documents: a) the client's final decisions related to the associated irrigation practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Insufficient Water - Inefficient Irrigation Water Use; Water Quality Degradation - Excessive sediment in surface waters, Nutrients transported to surface and groundwater, pesticides transported to surface and groundwater, pathogens and chemicals from manure, and biosolids or compost applications transported to surface and groundwater, excess salts in surface and groundwater; Degraded Plant Condition - Undesirable plant productivity and health; Inefficient Energy Use - Equipment and facilities.

Before Situation:

Producer wants to improve irrigation water management on their agricultural operation to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. The pump for the irrigation system is of unknown

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Irrigation Water Management DIA. The DIA 163 criteria include tasks needed to document the client's decisions and design of conservation practices which address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use. The Irrigation Water Management DIA meets the quality criteria for the DIA 163 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $13,253.74

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13,253.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 164 - Improved Management of Drainage Water Design

Scenario: #2 - Designs with Tile Map, One to Two

Scenario Description:

An agricultural producer wishes to address water quality degradation, poor plant productivity and health, and/or oxidation of organic matter in soils on a relatively flat crop field with a patterned drainage system through an EQIP contract with at least one (1) drainage practice scenario. A map of the tile system is available. Each "Design" indicates that each new device or component is closely related to other devices or components of the drainage water management system even if numerous practices are contracted. The Drainage Water Management DIA includes reviewing, and when needed, revising alternatives to address the identified concern(s). The Drainage Water Management DIA documents: a) the client's final decisions related to the associated drainage practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Water Quality - Excess nutrients in surface and groundwaters, Plant Condition - Plant Productivity and Health, and Soil Health - Subsidence.

Before Situation:

Producer wants to improve drainage water management on their agricultural operation to address water quality, plant condition, or soil health concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scen

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client's decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,851.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,851.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 164 - Improved Management of Drainage Water Design

Scenario: #18 - Designs with Tile Map, Greater Than or Equal to Three

Scenario Description:

An agricultural producer wishes to address water quality degradation, poor plant productivity and health, and/or oxidation of organic matter in soils on a relatively flat crop field with a patterned drainage system through an EQIP contract with multiple drainage practice scenario. A map of the tile system is available. Each "Design" indicates that each new device or component is closely related to other devices or components of the drainage water management system even if numerous practices are contracted. The Drainage Water Management DIA includes reviewing, and when needed, revising alternatives to address the identified concern(s). The Drainage Water Management DIA documents: a) the client's final decisions related to the associated drainage practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Water Quality - Excess nutrients in surface and groundwaters, Plant Condition - Plant Productivity and Health, and Soil Health - Subsidence.

Before Situation:

Producer wants to improve drainage water management on their agricultural operation to address water quality, plant condition, or soil health concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scen

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client's decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $10,769.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $10,769.29

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 164 - Improved Management of Drainage Water Design

Scenario: #34 - Designs with No Tile Map, One to Two

Scenario Description:

An agricultural producer wishes to address water quality degradation, poor plant productivity and health, and/or oxidation of organic matter in soils on a relatively flat crop field with a patterned drainage system through an EQIP contract with at least one (1) drainage practice scenario. A map of the tile system is not available. Each "Design" indicates that each new device or component is closely related to other devices or components of the drainage water management system even if numerous practices are contracted. The Drainage Water Management DIA includes reviewing, and when needed, revising alternatives to address the identified concern(s). The Drainage Water Management DIA documents: a) the client's final decisions related to the associated drainage practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Water Quality - Excess nutrients in surface and groundwaters, Plant Condition - Plant Productivity and Health, and Soil Health - Subsidence.

Before Situation:

Producer wants to improve drainage water management on their agricultural operation to address water quality, plant condition, or soil health concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scen

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client's decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $9,332.06

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9,332.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 164 - Improved Management of Drainage Water Design

Scenario: #50 - Designs with No Tile Map, Greater Than or Equal to Three

Scenario Description:

An agricultural producer wishes to address water quality degradation, poor plant productivity and health, and/or oxidation of organic matter in soils on a relatively flat crop field with a patterned drainage system through an EQIP contract with multiple drainage practice scenario. A map of the tile system is not available. Each "Design" indicates that new devices or components are closely related to other devices or components of the drainage water management system even if numerous designs are contracted. If more than one practice is contracted, then "2-5 Designs" shall be contracted for the Drainage Water Management DIA. The Drainage Water Management DIA includes reviewing, and, when needed, revising alternatives to address the identified concern(s). The Drainage Water Management DIA documents: a) the client's final decisions related to the associated drainage practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Water Quality - Excess nutrients in surface and groundwaters, Plant Condition - Plant Productivity and Health, and Soil Health - Subsidence.

Before Situation:

Producer wants to improve drainage water management on their agricultural operation to address water quality, plant condition, or soil health concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scen

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client's decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $11,730.35

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11,730.35

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 165 - Forest Management Practice Design

Scenario: #2 - Nonindustrial Private Forest, Less Than or Equal to 20 Acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 1 to 20 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assi

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $423.70

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $423.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 165 - Forest Management Practice Design

Scenario: #18 - Nonindustrial Private Forest, 501 to 1,000 Acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 501 to 1000 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assi

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,610.05

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,610.05

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 165 - Forest Management Practice Design

Scenario: #34 - Nonindustrial Private Forest, 101 to 250 Acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 101 to 250 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assi

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,016.87

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,016.87

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 165 - Forest Management Practice Design

Scenario: #50 - Nonindustrial Private Forest, Greater Than 1,000 Acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 1001 acres or greater in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assi

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,949.01

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,949.01

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 165 - Forest Management Practice Design

Scenario: #66 - Nonindustrial Private Forest, 251 to 500 Acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 251 to 500 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assi

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,355.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,355.83

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 165 - Forest Management Practice Design

Scenario: #82 - Nonindustrial Private Forest, 21 to 100 Acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 21 to 100 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assi

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $677.92

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $677.92

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 199 - Conservation Plan

Scenario: #18 - Small Farm

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The small farm planning scenario involves combinations of various specialty crops, small fruits, tree and vine crops, and small livestock enterprises on less than or equal to 10 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, or (if applicable to the enterprise) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,339.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,339.30

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 199 - Conservation Plan

Scenario: #34 - One Land Use, 10 to 199 Acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use and one agricultural enterprise covering up to less than 200 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, or (if applicable to the enterprise) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,232.98

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,232.98

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 199 - Conservation Plan

Scenario: #50 - One Land Use, 200 to 1,000 Acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use and one agricultural enterprise covering 200-1,000 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, or (if applicable to the enterprise) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,235.19

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,235.19

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 199 - Conservation Plan

Scenario: #66 - One Land Use, Greater Than 1,000 Acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use and one agricultural enterprise covering more than 1,000 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, or (if applicable to the enterprise) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,298.48

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8,298.48

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 199 - Conservation Plan

Scenario: #82 - Two Land Uses, 10 to 199 Acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use with two agricultural enterprises, or two land uses with one agricultural enterprise (ex. farmstead and cropland used for a dairy enterprise) covering less than 200 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,235.19

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,235.19

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 199 - Conservation Plan

Scenario: #98 - Two Land Uses, 200 to 1,000 Acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use with two agricultural enterprises, or two land uses with one agricultural enterprise (ex. farmstead and cropland used for a dairy enterprise) covering 200-1000 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,298.48

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8,298.48

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 199 - Conservation Plan

Scenario: #114 - Two Land Uses, Greater Than 1,000 Acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use with two agricultural enterprises, or two land uses with one agricultural enterprise (ex. farmstead and cropland used for a dairy enterprise) covering more than 1,000 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $10,109.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $10,109.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 199 - Conservation Plan

Scenario: #130 - Three or More Land Uses, 10 to 199 Acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use supporting three or more agricultural enterprises, two land uses supporting two or more agricultural enterprises, or three or more land uses and any number of enterprises on up to less than 200 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,298.48

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8,298.48

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 199 - Conservation Plan

Scenario: #146 - Three or More Land Uses, 200 to 1,000 Acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves three or more agricultural enterprises, two land uses supporting two or more agricultural enterprises, or three or more land uses and any number of enterprises on 200-1000 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $10,109.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $10,109.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 199 - Conservation Plan

Scenario: #162 - Three or More Land Uses, Greater Than 1,000 Acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use supporting three or more agricultural enterprises, two land uses supporting two or more agricultural enterprises, or three or more land uses and any number of enterprises on more than 1,000 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $11,668.32

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11,668.32

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #120 - Surface Year One Quality Assurance Project Plan

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $31,943.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $31,943.29

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #121 - Surface Year One, No Quality Assurance Project Plan

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for surface systems. The data will be transferred through semi-annual submittal and annual report which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system that has been accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $23,776.20

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $23,776.20

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #122 - Surface Year One Plus, No Quality Assurance Project Plan

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year per station, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). The data will be transferred through semi-annual submittal and annual report which include some preliminary annual analysis. This scenario will normally be used in year 1 to next to the last year of monitoring of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system that has been accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $23,173.61

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $23,173.61

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #123 - Surface Last Year

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected to complete monitoring period.

Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $27,789.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $27,789.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #124 - Tile Year One, Quality Assurance Project Plan

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $65,306.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $65,306.83

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #125 - Tile Year One Plus, No Quality Assurance Project Plan

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual reports, which include some preliminary annual analysis. This scenario will normally be used in year 1 to next to the last year of monitoring of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $56,537.15

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $56,537.15

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #127 - Tile Last Year

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $61,152.77

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $61,152.77

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #128 - Surface Year One Quality Assurance Project Plan, Two Treatment Sites

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $44,307.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $44,307.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #131 - Surface Last Year, Two Treatment Sites

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $40,384.58

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $40,384.58

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #133 - Tile Year One and Less Quality Assurance Project Plan, Two Treatment Sites

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (3 sites x 40 samples x 6 parameters = 720 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual reports, which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will not be prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $81,341.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $81,341.00

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #135 - Tile Last Year, Two Treatment Sites

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station with each sample analyzed for 6 separate parameters (3 sites x 40 samples x 6 parameters = 720 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $88,264.43

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $88,264.43

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #186 - Surface Year One and Less Quality Assurance Project Plan, Two Treatment Sites

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for each surface system, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). The data will be transferred through semi-annual submittal and annual report, which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will not be prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semi-annual submittal, and annual report for one control and two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $33,461.15

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $33,461.15

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #212 - Discrete Sampling, Single Parameter, Year One

Scenario Description:

This scenario is to be used for targeted, periodic WQ grab sampling design and implementation for evaluating and assessing conservation practice performance. This scenario provides for collection and analysis of one of the following water quality constituents: Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration, or Total Suspended Solids. A monitoring plan is created by a qualified individual to achieve monitoring goals. Event-based or regularly re-occurring grab samples are acquired from the concentrated flow streams at 2 locations, typically in a before-and-after or a side-by-side sampling design and then analyzed at a laboratory.

Before Situation:

The agricultural operation prior to implementing this activity will not have a monitoring plan prepared for evaluating and assessing the performance of a conservation practice.

After Situation:

The agricultural operation after implementing this activity will have produced and implemented a water quality monitoring plan for a single water quality constituent to evaluate and assess the performance of a conservation practice with respect to that constituent.

Feature Measure: Measuring sites

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $6,980.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,980.47

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #228 - Discrete Sampling, Single Parameter, Additional Year

Scenario Description:

This scenario extends, by an additional year, discreet WQ grab sampling design and implementation for evaluating and assessing conservation practice performance. This scenario provides for analysis of one of the following water quality constituents: Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration, or Total Suspended Solids. A monitoring plan is created by a qualified individual to achieve monitoring goals. Event-based or regularly re-occurring synoptic grab samples are acquired from the concentrated flow streams at 2 locations, typically in a before-and-after or a side-by-side sampling design and then analyzed at a laboratory.

Before Situation:

The agricultural operation prior to implementing this activity will not have a monitoring plan prepared for evaluating and assessing the performance of a conservation practice.

After Situation:

The agricultural operation after implementing this activity will have produced and implemented a water quality monitoring plan for a single water quality constituent to evaluate and assess the performance of a conservation practice with respect to that constituent.

Feature Measure: Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $5,595.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,595.79

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #84 - Surface

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with surface runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $29,313.88

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $29,313.88

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #85 - Surface, Cold Climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with surface runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions, and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $30,053.48

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $30,053.48

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #86 - Tile

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with tile or other subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system for a subsurface collection and separate surface automated sample collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, an area velocity sensor for pipe flow and estimation of submerged flow, and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $40,976.99

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $40,976.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #87 - Tile, Cold Climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with tile or other subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system for a subsurface collection and separate surface automated sample collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, an area velocity sensor for pipe flow and estimation of submerged flow, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $40,976.99

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $40,976.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #88 - Above and Below System, Warm Climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable where a conservation practice has a pre- and post treatment area in the same field drainage with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, and a berm or other directional flow structure to guide the runoff to a sampling flume. The actual installation will different on the subsurface flow by allowing a smaller precalibrated flume with the addition of a velocity sensor meter as in the tile alternative.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $41,198.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $41,198.17

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #89 - Above and Below System, Cold Climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable where a conservation practice has a pre- and post treatment area in the same field drainage with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions, and a berm or other directional flow structure to guide the runoff to a sampling flume. The actual installation will different on the subsurface flow by allowing a smaller pre-calibrated flume with the addition of a velocity sensor meter as in the tile alternative.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $45,268.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $45,268.37

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #90 - Retrofit, One

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge and back-up/solar power supply be added to existing system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,326.45

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,326.45

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #91 - Retrofit, Two

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, back-up/solar power supply, communications device, and depth (stage) sensor to be added to existing system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $10,089.71

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $10,089.71

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #92 - Retrofit, Three

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, back-up/solar power supply, communications device, pre-calibrated flow control structure, and depth (stage) sensor to be added to existing system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $13,882.40

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13,882.40

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #93 - Retrofit, Surface or Subsurface, One

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing above and below monitoring designed system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to an above and below system that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge and two back-up/solar power supply be added to existing paired system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,149.51

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,149.51

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #95 - Retrofit, Above Three

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing above and below monitoring designed system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to an above and below system that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, two back-up/solar power supplies, two communications devices, two pre-calibrated flumes, and two depth (stage) sensors to be added to existing paired system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $24,577.25

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $24,577.25

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 204 - Adaptive Management for Soil Health

Scenario: #2 - Basic

Scenario Description:

Field study with replicated plots for implementation of any of the conservation practices outlined in CEMA 204 Adaptive Management for Soil Health. Allows comparison of management and treatments on crop, grassland, forest, or rangeland small plots. Replicated treatment plots allow the producer to learn how to manage conservation practice on their operation and evaluate the management strategy effectiveness on soil health indicators particularly soil organic carbon, aggregate stability, pH, respiration. Scenario includes following the guidelines of the Conservation Practice in CEMA 204 Adaptive Management for Soil Health and CEMA 216 Soil Health Testing in small, replicated plots. Follow NRCS Technical Note 10- Adaptive Management. Study plot typical sizes range from 2-10 acres. Typical acre for scenario is 5.

Before Situation:

A producer is adopting the practice for the first time and desires to learn how to best to apply the practice within their unique landscape and management style or the producer is interested in improving the effectiveness of an existing practice or evalua

After Situation:

The study plots were installed with at least 4 replicated plots (control + treatment) designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in the selected practice. Data has been collected. Results are summarized in a report showing effectiveness of the treatments and any determined statistical analysis of collected data. Results are used to make management decisions to address soil health principles, erosion and water quality issues. Soil Health indicators and yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. This would be repeated yearly for 3 years.

Feature Measure: Number of Study Plots

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,735.45

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,735.45

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 204 - Adaptive Management for Soil Health

Scenario: #18 - Basic with Soil Health Test

Scenario Description:

Field study with replicated plots for implementation of any of the conservation practices outlined in CEMA 204 Adaptive Management for Soil Health. Allows comparison of management and treatments on crop, grassland, forest, or rangeland small plots. Replicated treatment plots allow the producer to learn how to manage conservation practice on their operation and evaluate the management strategy effectiveness on soil health indicators particularly soil organic carbon, aggregate stability, active carbon, pH, texture and respiration. Scenario includes following the guidelines of the Conservation Practice in CEMA 204 Adaptive Management for Soil Health in small replicated plots. Follow NRCS Technical Note 10- Adaptive Management. Study plot typical sizes range from 2-10 acres. Typical acre for scenario is 5.

Before Situation:

A producer is adopting the practice for the first time and desires to learn how to best to apply the practice within their unique landscape and management style or the producer is interested in improving the effectiveness of an existing practice or evalua

After Situation:

Study plots were installed with treatments applied per the study design. Plot field data is collected. Soil health soil samples were collected in the fall and analyzed for include at least SOC by dry combustion, Active Carbon, pH, texture (soil texture in year 1 only to calculate AWC), aggregate stability, and 24-hr respiration. Soil Health indicators and yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. A final report summarizes the effect of the treatment on soil health using interpretation of lab analysis and any statical analysis of collected field data. Results will inform future management decisions for the conservation practice to improve or maintain soil health.

Feature Measure: Number of field study plots

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,829.28

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,829.28

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 206 - Feed and Forage Analysis

Scenario: #2 - Nutrient Composition Analysis

Scenario Description:

Testing of feed or forage for nutrient composition. Each lot (forage lot or lot of feed) should be sampled and tested separately. Testing of bale or stack forage for nutrient composition. Factors to consider when determining lot size include forage species, stage of maturity, cutting schedule, soil type, soil fertility, presence of weeds, harvest conditions, storage effects. Each lot should be sampled and tested separately. Testing of standing forage for nutrient composition. Forage can be tested to determine if it is worth cutting for hay or to determine if grazing animals require supplemental feed. Select at lease eight representative locations and clip the forage at grazing or harvest height from a one square foot area at each location. In grazing situations try and select the species being selectively grazed. Cut the samples into 2- to 3-inch pieces, combine in a bucket and mix well. Spread the sample on paper and allow it to air-dry for two days or place in a pan and dry overnight in an oven at 150°F before mailing it to the laboratory. Analysis of silage (fresh or silo) for nutrient composition. Remove two to three gallons of silage from different sections of a load and save about a quart using the quartering method. Freeze the samples until all loads are sampled. Combine samples, mix thoroughly, and reduce to about one quart by quartering. The final sample should be placed in the cloth forage sample bag, and the full forage bag inserted into a plastic bag to prevent moisture loss during mailing. Remove excess air from the plastic bag before sealing. Do not insert the plastic bag inside the cloth forage bag since damage may result when it is processed by the laboratory. Freeze the sample prior to mailing and mail samples early in the week to avoid weekend delays and reduce chances of molding. Upright silos- 12 handfuls of silage as it is discharged from the silo. Horizontal silos-hand grab same as upright but access the entire surface of the open face. Analysis of dietary ration, feed, or diet for nutrient composition.

Before Situation:

Producer wishes to reduce nutrient excretion or emission from livestock or poultry to air, soil, or water. To accomplish a reduction in nutrient excretion and emissions, knowledge of nutrient input from silage is required to optimally balance the diet for

After Situation:

Animal diet is optimally balanced for nutrient composition and nutrients excreted or emitted by the animal are reduced.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,154.32

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,154.32

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 207 - Site Assessment and Soil Testing for Contaminants Activity

Scenario: #2 - Site Evaluation

Scenario Description:
This practice applies to urban sites where the desired land use is cropland. Sites may have been residential, industrial or commercial land use in the past and the risk for soil contaminants is unknown.

Before Situation:
Soil suitability for agricultural production is unknown with potential risk of contamination from prior land use activities.

After Situation:
Site history has been researched and findings indicate a potential for the presence of contaminants. Final report provides the landowner with the level of risk and recommendation for further testing. Reports may be used in the conservation planning process to explore non-remedial conservation practices to reduce risk of contaminants entering the food products.

Feature Measure: Each Site

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,276.22

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,276.22

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 207 - Site Assessment and Soil Testing for Contaminants Activity

Scenario: #18 - Site Evaluation and Testing for Soil Contaminants

Scenario Description:
This practice applies to urban sites where the desired land use is cropland. Sites may have been residential, industrial or commercial land use in the past and the risk for soil contaminants is unknown.

Before Situation:
Soil suitability for agricultural production is unknown with potential risk of contamination from prior land use activities.

After Situation:
Site history has been researched and findings indicate a potential for the presence of contaminants. The soil has been collected and tested for heavy metals, VOCs and PAHs. Final reports provide the landowner with the level of risk. Reports may be used in the conservation planning process to explore non-remedial conservation practices to reduce risk of contaminants entering the food products.

Feature Measure: Each Site

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $12,828.66

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12,828.66

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 207 - Site Assessment and Soil Testing for Contaminants Activity

Scenario: #34 - Soil Testing, Subsurface Investigation

Scenario Description:

This practice applies to urban sites where the desired land use is cropland. Sites may have been residential, industrial or commercial land use in the past and the risk for soil contaminants is unknown. The landowner has a prior Environmental Site Assessment completed by an Environmental Professional. The ESA report recommends further subsurface investigation. OR Landowner has NRCS report from portable Xray Fluorescence screening that detected soil contaminants.

Before Situation:

Soil suitability for agricultural production is unknown with potential risk of contamination from prior land use activities.

After Situation:

Site history has been researched and findings indicate a potential for the presence of contaminants. The soil has been collected and tested for heavy metals, VOCs and PAHs. Final reports provide the landowner with the level of risk. Reports may be used in the conservation planning process to explore non-remedial conservation practices to reduce risk of contaminants entering the food products.

Feature Measure: Each Site

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,552.44

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8,552.44

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 207 - Site Assessment and Soil Testing for Contaminants Activity

Scenario: #50 - Low Risk Sites

Scenario Description:

This practice applies to urban sites where the desired land use is cropland. Sites may have been residential, industrial or commercial land use in the past and the risk for soil contaminants is unknown. The landowner has a prior Environmental Site Assessment completed by an Environmental Professional. The ESA report does not require further investigation. OR Landowner has NRCS report from portable Xray Fluorescence screening that detected soil contaminants. Screening detection levels are below the State Environmental Protection Agency or equivalent agency published safety thresholds for bare soil residential use.

Before Situation:

Soil suitability for agricultural production is unknown with potential risk of contamination from prior land use activities.

After Situation:

Site history has been researched and findings indicate a potential for the presence of contaminants. The soil has been collected and tested for heavy metals only. Soil test reports provide the landowner with the level of risk. Reports may be used in the conservation planning process to explore non-remedial conservation practices to reduce risk of contaminants entering the food products.

Feature Measure: Area of Soil Tested

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 4.0

Scenario Total Cost: $918.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $229.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 209 - PFAS Testing in Water or Soil

Scenario: #2 - Low Complexity, Single Sample

Scenario Description:

A single sample of water or soil is required to provide prescreening information to the landowner to determine if PFAS may be present in water or soils at their operation. In this scenario, the environmental media being sampled by the qualified individual is of low complexity: there is little temporal or spatial variation to account for in sampling, therefore no pre-sampling planning needed. This could include a single well used for stockwater or irrigation systems. The typical number of tests is 1, assuming that a landowner has a single well or a single field that can be represented by a single composite sample.

Before Situation:

Water or soil on an agricultural operation are of unknown PFAS status. PFAS laboratory analysis has not been conducted on the water or soil of interest.

After Situation:

A laboratory PFAS analysis was completed, and the results were interpreted and explained to the landowner. The landowner now has pre-screening information that suggests if PFAS may be present in water (or soil) on their operation. If testing detects PFAS in water or soil at levels that exceed State or Federal screening levels, the landowner can decide to pursue non-NRCS sources for follow-up detailed PFAS assessment.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,232.01

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,232.01

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 209 - PFAS Testing in Water or Soil

Scenario: #18 - Low Complexity, Multiple Samples

Scenario Description:

Multiple samples of water or soil are needed to provide prescreening information to the landowner to determine if PFAS may be present in water or soils at their operation. In this scenario, the environmental media being sampled by the qualified individual is of low complexity. There is little temporal or spatial variation to account for in sampling, therefore no pre-sampling planning needed. This scenario could apply to small ponds or wells used for stockwater or irrigation systems, a small field, or a small number of fields of uniform soil composition. This scenario assumes that additional time is needed for each collection of multiple samples. The typical number of tests is 5, assuming that a landowner has four fields and a well and each field can be represented by a single composite sample.

Before Situation:

Water or soil on an agricultural operation are of unknown PFAS status. PFAS laboratory analysis has not been conducted on the water or soil of interest.

After Situation:

A laboratory PFAS analysis was completed, and the results were interpreted and explained to the landowner. The landowner now has pre-screening information that suggests if PFAS may be present in water (or soil) on their operation. If testing detects PFAS in water or soil at levels that exceed State or Federal screening levels, the landowner can decide to pursue non-NRCS sources for follow-up detailed PFAS assessment.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 5.0

Scenario Total Cost: $4,313.80

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $862.76

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 209 - PFAS Testing in Water or Soil

Scenario: #34 - High Complexity, Multiple Samples

Scenario Description:

Multiple samples of water or soil are needed to provide prescreening information to the landowner to determine if PFAS may be present in water or soils at their operation. In this scenario, the environmental media being sampled is of high complexity. There is a need to account for this temporal or spatial variation in sampling. Therefore, additional time is needed to prepare and discuss a comprehensive sampling strategy to detect PFAS and the final comprehensive report with the landowner. This scenario could apply to the agricultural use of multiple sources of water (ponds, wells, and reclaimed water) for stockwater or irrigation systems or to assess multiple fields with variable soil composition. This scenario assumes that additional time is needed for each collection of multiple samples. The typical number of tests is 5, assuming that a farmer has many fields, and the producer doesn't want to test all or has large fields with highly variable soil composition.

Before Situation:

Water or soil on an agricultural operation are of unknown PFAS status. PFAS laboratory analysis has not been conducted on the water or soil of interest.

After Situation:

A laboratory PFAS analysis was completed, and the results were interpreted and explained to the landowner. The landowner now has pre-screening information that suggests if PFAS may be present in water (or soil) on their operation. If testing detects PFAS in water or soil at levels that exceed State or Federal screening levels, the landowner can decide to pursue non-NRCS sources for follow-up detailed PFAS assessment.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 5.0

Scenario Total Cost: $5,236.92

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,047.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 216 - Soil Health Testing

Scenario: #165 - Basic

Scenario Description:

A laboratory soil health assessment for a suite of indicators is conducted using recommended methods to evaluate and/or monitor conservation practices. Laboratory tests for five (~6 2 pH methods) indicators: soil organic carbon concentration, active carbon, soil texture, pH CaCl, pH H2O and aggregate stability. Sample collection is completed by a qualified individual and includes time for soil sampling and submission. Lab method for organic carbon concentration is dry combustion. For calcareous soil: Total C - Inorganic C. Lab method for carbon mineralization potential is 24-hr CO2 burst resulting from rewetting air dried, sieved soil. Lab method for aggregate stability is slaking.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

After Situation:

A laboratory soil health test of was completed for the suite of three soil health indicators and results explained to the producer and used to establish benchmark conditions for soil health management practices or evaluate the effectiveness of a conservation practice.

Feature Measure: Test

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost:	$650.45	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$650.45	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 216 - Soil Health Testing

Scenario: #181 - Single Indicator

Scenario Description:

A laboratory soil health assessment for a single indicator is conducted using recommended methods to evaluate and/or monitor conservation practices. Laboratory tests available: soil organic carbon concentration, carbon mineralization potential, pH, PoxC, soil texture, ACE Protein, PLFA, Enzymes, Respiration 1,2,3, or 4-day, and aggregate stability. Sample collection is completed by a qualified individual and includes time for soil sampling and submission. Lab method for organic carbon concentration is dry combustion. For calcareous soil: Total C - Inorganic C. Lab method for carbon mineralization potential is 24-hr CO2 burst resulting from rewetting air dried, sieved soil.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

After Situation:

A laboratory soil health test of was completed for a single indicator and results explained to the producer and used to establish benchmark conditions for soil health management practices or evaluate the effectiveness of a conservation practice.

Feature Measure: polygon

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $422.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $422.83

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 216 - Soil Health Testing

Scenario: #270 - Minimal Suite

Scenario Description:

A laboratory soil health assessment for a suite of indicators is conducted using recommended methods to evaluate and/or monitor conservation practices. Laboratory tests for three indicators: soil organic carbon concentration, carbon mineralization potential, and aggregate stability. Sample collection is completed by a qualified individual and includes time for soil sampling and submission. Lab method for organic carbon concentration is dry combustion. For calcareous soil: Total C - Inorganic C.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

After Situation:

A laboratory soil health test of was completed for the suite of six soil health indicators and results explained to the producer and used to establish benchmark conditions for soil health management practices or evaluate the effectiveness of a conservation practice.

Feature Measure: Test

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $787.97

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $787.97

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 216 - Soil Health Testing

Scenario: #286 - Basic and Single Indicator

Scenario Description:

A laboratory soil health assessment for a suite of indicators is conducted using recommended methods to evaluate and/or monitor conservation practices. Laboratory tests for five (~6 2 pH methods) indicators: soil organic carbon concentration, active carbon, soil texture, pH CaCl, pH H2O and aggregate stability. Sample collection is completed by a qualified individual and includes time for soil sampling and submission. Lab method for organic carbon concentration is dry combustion. For calcareous soil: Total C - Inorganic C. Lab method for carbon mineralization potential is 24-hr CO2 burst resulting from rewetting air dried, sieved soil. Lab method for aggregate stability is slaking. Producer also selects 1 additional indicator from the Single Indicator List.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

After Situation:

A laboratory soil health test was completed for the suite of three soil health indicators and results explained to the producer and used to establish benchmark conditions for soil health management practices or evaluate the effectiveness of a conservation practice.

Feature Measure: Test

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $833.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $833.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 216 - Soil Health Testing

Scenario: #302 - Minimal Suite and Single Indicator

Scenario Description:

A laboratory soil health assessment for a suite of indicators is conducted using recommended methods to evaluate and/or monitor conservation practices. Laboratory tests for three indicators: soil organic carbon concentration, carbon mineralization potential, and aggregate stability. Sample collection is completed by a qualified individual and includes time for soil sampling and submission. Lab method for organic carbon concentration is dry combustion. For calcareous soil: Total C - Inorganic C.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

After Situation:

A laboratory soil health test of was completed for the suite of six soil health indicators and results explained to the producer and used to establish benchmark conditions for soil health management practices or evaluate the effectiveness of a conservation practice.

Feature Measure: Test

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $970.54

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $970.54

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #2 - Soil Testing

Scenario Description:

A qualified individual will develop a nutrient testing strategy, collect soil samples and prepare for laboratory analysis; and interpret soil nutrient needs. Typical management unit is 100 acres. Includes Comprehensive Soil Testing to provide both Macro and micro soil nutrient levels.

Before Situation:

Producer does not have soil test laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH for each field or management unit in crop production. Nutrients are applied without knowledge of soil test levels.

After Situation:

Soil samples have been collected and analyzed. The strategy for sampling is described and a map if sampling points is provided. Qualified individual concludes nutrients are needed or not based on soil test results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $955.95

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $955.95

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #34 - Zone or Grid Soil Testing

Scenario Description:

A qualified individual will develop a nutrient testing strategy, collect soil samples based on a 2.5 acre grid or zone, and prepare for laboratory analysis; and interpret soil nutrient needs. Typical management unit is 100 acres.

Before Situation:

Producer does not have soil test laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH for each field or management unit in crop production. Nutrients are applied without knowledge of soil test levels.

After Situation:

Soil samples have been collected and analyzed. The strategy for sampling is described and a map if sampling points is provided. Qualified individual concludes nutrients are needed or not based on soil test results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,252.42

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,252.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #50 - Manure or Compost

Scenario Description:

A qualified individual will develop a nutrient testing strategy, collect manure or compost samples and prepare for laboratory analysis; and interpret crop nutrient needs. Sampling protocol for liquid manure includes agitation per LGU guidelines. Dry manure and compost sampling protocol are performed per LGU guidelines.

Before Situation:

Producer does not have manure or compost laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH of the organic source. Nutrients are applied without knowledge of manure or compost nutrient levels.

After Situation:

Manure or Compost samples have been collected and analyzed. The strategy for sampling is described. Qualified individual concludes the amount of nutrients needed for the crop based on manure or compost test results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,088.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,088.67

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #66 - Water Sampling

Scenario Description:

A qualified individual will develop a nutrient testing strategy, collect source water samples and prepare for laboratory analysis; and interpret crop nutrient needs. Typical irrigation water sampling for nutrients, may include drainage water sampling for monitoring nutrient loss or if drainage water is being reused.

Before Situation:

Producer does not have Source Water Nutrient laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH of the water source. Nutrients are applied without knowledge of source water nutrient levels.

After Situation:

Water samples have been collected and analyzed. The strategy for sampling is described. Qualified individual concludes the amount of nutrients needed for the crop based on Source Water test results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $699.46

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $699.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #82 - Acidic or Alkaline Soil Testing

Scenario Description:

Soil analysis is used as a diagnostic tool to identify fields with soil acidification problems in no-till cropping systems. One soil sample is collected every 40 acres from only the top 3 inches of soil and analyzed for both pH and buffer pH. A recommended three cores should be taken from a 4 sq ft sampling area every 40 acres and composited to provide at least 100 grams of soil for the laboratory test. Test results are georeferenced on a map and can be used to build a lime application budget for the field.

Before Situation:

Field shows crop yield decline and areas of lower pH are suspected but not tested. No-till application of nitrogen fertilizers is causing acidification. Soil is sampled to 6-inch depth, multiple sub-samples are collected from random locations in the field

After Situation:

One composited soil sample is collected in a 4 sq ft area from the top 3 inches of soil every 40 acres,. The sample is analyzed for pH and buffer pH. Sample results are georeferenced on a map and used to identify and diagnose soil acidification problems. Follow up by developing or updating a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590. Producers can then use this diagnostic information to apply lime to raise the soil pH. Topsoil pH and plant productivity and health are both maintained at desirable levels.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost:	$247.84	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$247.84	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #98 - Soil Test with Organic Nutrients, Less Than or Equal to One Acre

Scenario Description:

A qualified individual will develop a nutrient testing strategy, collect soil and nutrient source samples, prepare for laboratory analysis and interpret soil and crop nutrient needs. Typical field size is less than or equal to 0.5 acres (22000 sq ft). Includes Comprehensive Soil Testing to provide both Macro and micro soil nutrient levels.

Before Situation:

Producer does not have soil and nutrient source laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH for the soil and nutrient source. Nutrients are applied without knowledge of soil and nutrient source test levels.

After Situation:

Soil and nutrient source samples have been collected and analyzed. The strategy for sampling is described. Qualified individual concludes nutrients are needed or not based on soil test results. The amount of nutrients needed is based on Nutrient Source results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $473.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $473.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #114 - Soil Testing, Small Production Beds

Scenario Description:

A qualified individual will develop a nutrient testing strategy, collect 5 soil subsamples and combine to one representative sample, prepare for laboratory analysis, and interpret soil nutrient needs. This scenario considers costs for 5 or less raised beds. Cost includes comprehensive soil test based on expected specialty crop production.

Before Situation:

Producer does not have soil test laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH for each field or management unit in crop production. Nutrients are applied without knowledge of soil test levels.

After Situation:

Soil samples have been collected and analyzed. The strategy for sampling is described and a map if sampling points is provided. Qualified individual concludes nutrients are needed or not based on soil test results. A Nutrient Management Plan CPS 590 or DIA 157 may be developed after the report is complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $612.18

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $612.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 218 - Carbon Sequestration and Greenhouse Gas Mitigation Assessment

Scenario: #2 - Low Complexity

Scenario Description:

An evaluation of the quantifiable carbon sequestration and greenhouse gas mitigation effects using the COMET-Farm tool. The information on the type of operation, land use, and management history is collected initially as part of the planning process for a conservation plan focused on carbon sequestration and greenhouse gas mitigation. The carbon sequestration and greenhouse gas mitigation CEMA includes a complete COMET-Farm project designed to evaluate the current conservation plan and the baseline and historic management impacts on carbon sequestration and greenhouse gas mitigation. The COMET-Farm evaluation can occur concurrently or following a conservation plan. Low complexity would include simple systems of a single enterprise, low number of management units, detailed available history.

Before Situation:

The producer's objectives are to improve soil carbon sequestration and greenhouse gas mitigation and to quantify the effects of a conservation plan. The quantifiable effects on soil carbon sequestration and greenhouse gas mitigation of the current and his

After Situation:

Producer receives a detailed report from COMET-Farm that quantifies the soil carbon sequestration and greenhouse gas mitigation effects of historic, baseline, and (scenario management) proposed conservation plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $923.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $923.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 218 - Carbon Sequestration and Greenhouse Gas Mitigation Assessment

Scenario: #18 - Medium Complexity

Scenario Description:

An evaluation of the quantifiable carbon sequestration and greenhouse gas mitigation effects using the COMET-Farm tool. The information on the type of operation, land use, and management history is collected initially as part of the planning process for a conservation plan focused on carbon sequestration and greenhouse gas mitigation. The carbon sequestration and greenhouse gas mitigation CEMA includes a complete COMET-Farm project designed to evaluate the current conservation plan and the baseline and historic management impacts on carbon sequestration and greenhouse gas mitigation. The COMET-Farm evaluation can occur concurrently or following a conservation plan. Medium complexity would include systems with more than one enterprises, a moderate number of management units, complex or difficult to define history.

Before Situation:

The producer objectives are to improve soil carbon sequestration and greenhouse gas mitigation and quantify the effects of a conservation plan. The quantifiable effects on soil carbon sequestration and greenhouse gas mitigation of the current and historic

After Situation:

Producer receives a detailed COMET-Farm report that quantifies the soil carbon sequestration and greenhouse gas mitigation effects of historic, baseline, and (scenario management) proposed conservation plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,384.69

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,384.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 218 - Carbon Sequestration and Greenhouse Gas Mitigation Assessment

Scenario: #34 - High Complexity

Scenario Description:

An evaluation of the quantifiable carbon sequestration and greenhouse gas mitigation effects using the COMET-Farm tool. The information on the type of operation, land use, and management history is collected initially as part of the planning process for a conservation plan focused on carbon sequestration and greenhouse gas mitigation. The carbon sequestration and greenhouse gas mitigation CEMA includes a complete COMET-Farm project designed to evaluate the current conservation plan and the baseline and historic management impacts on carbon sequestration and greenhouse gas mitigation. The COMET-Farm evaluation can occur concurrently or following a conservation plan. High complexity would include systems with multiple enterprises, high number of management units, and complex or incomplete management history.

Before Situation:

The producer objectives are to improve soil carbon sequestration and greenhouse gas mitigation and quantify the effects of a conservation plan. The quantifiable effects on soil carbon sequestration and greenhouse gas mitigation of the current and historic

After Situation:

Producer receives a detailed report from COMET-Farm that quantifies the soil carbon sequestration and greenhouse gas mitigation effects of historic, baseline, and (scenario management) proposed conservation plan .

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,846.25

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,846.25

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 219 - Prescribed Grazing Conservation Evaluation and Monitoring Activity

Scenario: #2 - Grazed Lands, Less Than or Equal to 100 Acres

Scenario Description:

Small agricultural operation with less than 100 acres grazed land. Natural Resource Concern: soil erosion, water quality, fish and wildlife, plant condition, or appropriate resource concerns.

Before Situation:

Producer is not utilizing a certified Technical Service Provider (TSP) to evaluate and monitor all practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR), and/or DIA 159. Information is not being gathered to evaluate the effect

After Situation:

Producer will utilize a certified Technical Service Provider (TSP) to evaluate and monitor all grazing management practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR) and/or DIA 159. Evaluation and monitoring activities will provide all needed information to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan will be implemented with appropriate protocols and data records that evaluate whether the grazing strategy identified in the grazing plan is resulting in a movement toward meeting goals and objectives. Specific evaluation activities will be chosen based on stated objectives and pertinent resource concerns assessments identified in the Conservation Plan, CPA, Implementation Requirement (IR) and/or DIA. Evaluation and monitoring will meet the applicable "plans and specifications" and "operation and maintenance" sections found in CPS 528. Other supporting and facilitating conservation practices will also be monitored and evaluated. The CEMA narrative will describe the overall methodology, decision support tools and recommended management actions to meet purposes and criteria within practice standards. Job sheets and implementation requirement documents found in State's FOTG Section IV Conservation practices may be used.

Feature Measure: number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,047.26

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,047.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 219 - Prescribed Grazing Conservation Evaluation and Monitoring Activity

Scenario: #18 - Grazed Lands, 101 to 500 Acres

Scenario Description:

Agricultural operation between 101 and 500 acres grazed land. Natural Resource Concern: soil erosion, water quality, fish and wildlife, plant condition, or appropriate resource concerns.

Before Situation:

Producer is not utilizing a certified Technical Service Provider (TSP) to evaluate and monitor all practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR), and/or DIA 159. Information is not being gathered to evaluate the effect

After Situation:

Producer will utilize a certified Technical Service Provider (TSP) to evaluate and monitor all grazing management practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR) and/or DIA 159. Evaluation and monitoring activities will provide all needed information to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan will be implemented with appropriate protocols and data records that evaluate whether the grazing strategy identified in the grazing plan is resulting in a movement toward meeting goals and objectives. Specific evaluation activities will be chosen based on stated objectives and pertinent resource concerns assessments identified in the Conservation Plan, CPA, Implementation Requirement (IR) and/or DIA. Evaluation and monitoring will meet the applicable "plans and specifications" and "operation and maintenance" sections found in CPS 528. Other supporting and facilitating conservation practices will also be monitored and evaluated. The CEMA narrative will describe the overall methodology, decision support tools and recommended management actions to meet purposes and criteria within practice standards. Job sheets and implementation requirement documents found in State's FOTG Section IV Conservation practices may be used.

Feature Measure: number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,570.89

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,570.89

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 219 - Prescribed Grazing Conservation Evaluation and Monitoring Activity

Scenario: #34 - Grazed Lands, 501 to 1,500 Acres

Scenario Description:

Small agricultural operation with 501 to 1,500 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, or appropriate resource concerns.

Before Situation:

Producer is not utilizing a certified Technical Service Provider (TSP) to evaluate and monitor all practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR), and/or DIA 159. Information is not being gathered to evaluate the effect

After Situation:

Producer will utilize a certified Technical Service Provider (TSP) to evaluate and monitor all grazing management practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR) and/or DIA 159. Evaluation and monitoring activities will provide all needed information to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan will be implemented with appropriate protocols and data records that evaluate whether the grazing strategy identified in the grazing plan is resulting in a movement toward meeting goals and objectives. Specific evaluation activities will be chosen based on stated objectives and pertinent resource concerns assessments identified in the Conservation Plan, CPA, Implementation Requirement (IR) and/or DIA. Evaluation and monitoring will meet the applicable "plans and specifications" and "operation and maintenance" sections found in CPS 528. Other supporting and facilitating conservation practices will also be monitored and evaluated. The CEMA narrative will describe the overall methodology, decision support tools and recommended management actions to meet purposes and criteria within practice standards. Job sheets and implementation requirement documents found in State's FOTG Section IV Conservation practices may be used.

Feature Measure: number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,618.16

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,618.16

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 219 - Prescribed Grazing Conservation Evaluation and Monitoring Activity

Scenario: #50 - Grazed Lands, 1,501 to 5,000 Acres

Scenario Description:

Agricultural operation with 1,501 to 5,000 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, or appropriate resource concerns.

Before Situation:

Producer is not utilizing a certified Technical Service Provider (TSP) to evaluate and monitor all practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR), and/or DIA 159. Information is not being gathered to evaluate the effect

After Situation:

Producer will utilize a certified Technical Service Provider (TSP) to evaluate and monitor all grazing management practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR) and/or DIA 159. Evaluation and monitoring activities will provide all needed information to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan will be implemented with appropriate protocols and data records that evaluate whether the grazing strategy identified in the grazing plan is resulting in a movement toward meeting goals and objectives. Specific evaluation activities will be chosen based on stated objectives and pertinent resource concerns assessments identified in the Conservation Plan, CPA, Implementation Requirement (IR) and/or DIA. Evaluation and monitoring will meet the applicable "plans and specifications" and "operation and maintenance" sections found in CPS 528. Other supporting and facilitating conservation practices will also be monitored and evaluated. The CEMA narrative will describe the overall methodology, decision support tools and recommended management actions to meet purposes and criteria within practice standards. Job sheets and implementation requirement documents found in State's FOTG Section IV Conservation practices may be used.

Feature Measure: number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,665.42

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,665.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 219 - Prescribed Grazing Conservation Evaluation and Monitoring Activity

Scenario: #66 - Grazed Lands, 5,001 to 10,000 Acres

Scenario Description:

Agricultural operation with 5,001 to 10,000 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, or appropriate resource concerns.

Before Situation:

Producer is not utilizing a certified Technical Service Provider (TSP) to evaluate and monitor all practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR), and/or DIA 159. Information is not being gathered to evaluate the effect

After Situation:

Producer will utilize a certified Technical Service Provider (TSP) to evaluate and monitor all grazing management practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR) and/or DIA 159. Evaluation and monitoring activities will provide all needed information to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan will be implemented with appropriate protocols and data records that evaluate whether the grazing strategy identified in the grazing plan is resulting in a movement toward meeting goals and objectives. Specific evaluation activities will be chosen based on stated objectives and pertinent resource concerns assessments identified in the Conservation Plan, CPA, Implementation Requirement (IR) and/or DIA. Evaluation and monitoring will meet the applicable "plans and specifications" and "operation and maintenance" sections found in CPS 528. Other supporting and facilitating conservation practices will also be monitored and evaluated. The CEMA narrative will describe the overall methodology, decision support tools and recommended management actions to meet purposes and criteria within practice standards. Job sheets and implementation requirement documents found in State's FOTG Section IV Conservation practices may be used.

Feature Measure: number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,712.68

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,712.68

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 219 - Prescribed Grazing Conservation Evaluation and Monitoring Activity

Scenario: #82 - Grazed Lands, Greater Than 10,000 Acres

Scenario Description:

Agricultural operation with greater than 10,000 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, or appropriate resource concerns.

Before Situation:

Producer is not utilizing a certified Technical Service Provider (TSP) to evaluate and monitor all practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR), and/or DIA 159. Information is not being gathered to evaluate the effect

After Situation:

Producer will utilize a certified Technical Service Provider (TSP) to evaluate and monitor all grazing management practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR) and/or DIA 159. Evaluation and monitoring activities will provide all needed information to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan will be implemented with appropriate protocols and data records that evaluate whether the grazing strategy identified in the grazing plan is resulting in a movement toward meeting goals and objectives. Specific evaluation activities will be chosen based on stated objectives and pertinent resource concerns assessments identified in the Conservation Plan, CPA, Implementation Requirement (IR) and/or DIA. Evaluation and monitoring will meet the applicable "plans and specifications" and "operation and maintenance" sections found in CPS 528. Other supporting and facilitating conservation practices will also be monitored and evaluated. The CEMA narrative will describe the overall methodology, decision support tools and recommended management actions to meet purposes and criteria within practice standards. Job sheets and implementation requirement documents found in State's FOTG Section IV Conservation practices may be used.

Feature Measure: number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,283.57

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,283.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 221 - Soil Organic Carbon Stock Monitoring

Scenario: #2 - Soil Carbon Stock Sampling

Scenario Description:

Soil is collected for organic carbon testing following the measurement, monitoring, reporting and verification (MMRV) protocol. PODS land use and management information is collected and documents. Soil sample collection strategy is planned in an area of interest (AOI) of <10 acres. Soil samples are collected by a Qualified Individual (QI) at 6 different locations within the AOI (3 locations in 3 different strata). Soil bulk density is measured before being analyzed for organic carbon by dry combustion. Payment includes time for collecting management information, developing sampling strategy, soil sampling and sample preparation, submission to the laboratory, and interpretation/delivery of results.

Before Situation:

No recent measurements of soil organic carbon stocks have been made in the AOI. Conservation practices are planned or installed for the purpose of improving soil health and sequestering carbon.

After Situation:

Land use and management information is collected. Soil bulk density was measured before being analyzed for organic carbon by dry combustion. The results were interpreted and explained to the producer. Initial measurements are used to establish benchmark conditions for soil organic carbon stocks. Subsequent measurements are used to evaluate the effectiveness of a conservation practice on carbon sequestration and report the change over time.

Feature Measure: Area of Interest Polygon

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,861.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,861.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 221 - Soil Organic Carbon Stock Monitoring

Scenario: #82 - Citizen Science

Scenario Description:

Soil is collected for organic carbon testing following the measurement, monitoring, reporting and verification (MMRV) protocol. PODS land use and management information is collected and documents. Soil sample collection strategy is planned in an area of interest (AOI) of <10 acres. Soil samples are collected by a Qualified Individual (QI) at 9 different locations within the AOI (3 locations in 3 different strata). Soil bulk density is measured before being analyzed for organic carbon by dry combustion. Payment includes time for collecting management information, developing sampling strategy, soil sampling and sample preparation, submission to the laboratory, and interpretation/delivery of results.

Before Situation:

No recent measurements of soil organic carbon stocks have been made in the AOI. Conservation practices are planned or installed for the purpose of improving soil health and sequestering carbon.

After Situation:

Land use and management information is collected. Soil bulk density was measured before being analyzed for organic carbon by dry combustion. The results were interpreted and explained to the producer. Initial measurements are used to establish benchmark conditions for soil organic carbon stocks. Subsequent measurements are used to evaluate the effectiveness of a conservation practice on carbon sequestration and report the change over time.

Feature Measure: Area of Interest Polygon

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,146.40

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,146.40

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 222 - Indigenous Stewardship Methods Evaluation

Scenario: #2 - Indigenous Knowledge, 301 to 1,000 Acres

Scenario Description:

The scenario involves obtaining assistance from a Qualified Individual, designated by the governing body of a Tribe or Indigenous culture, to evaluate the designated planning area, then gather knowledge about indigenous knowledge, and deliver results to the client and NRCS. The resulting information can be used to inform the conservation planning and implementation processes, meet the client's objectives by addressing one or more NRCS-recognized resource concerns using techniques that align with Tribal or Indigenous knowledge.

Before Situation:

Through the NRCS conservation planning process, a conservation planner has identified client objectives for addressing natural resource concerns (Soil, Water, Animals, Plants, Air + Energy) and socio-economic considerations such as increasing capacity for

After Situation:

The client hired a QI to provide the CEMA assistance. The QI has met with client and visited the planning area, in order to develop an understanding of its capabilities, limitations, and needs within a culturally appropriate context. Indigenous knowledge about the planning area has been gathered from sources approved by a Tribe or Indigenous culture. The QI verifies with the Tribe's or Indigenous culture's governing body, that the information gathered is accurate- then provides a report, map and other supporting documentation of their ISM evaluation of the planning area to the client; and a copy is shared with NRCS. In the future, the information this CEMA provides can assists the participant and the planner refine conservation objectives; and realize opportunities to incorporate Indigenous knowledge into a conservation plan and/or conservation practice implementations.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $17,297.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $17,297.37

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 222 - Indigenous Stewardship Methods Evaluation

Scenario: #18 - Indigenous Knowledge, 1,001 to 3,000 Acres

Scenario Description:

The scenario involves obtaining assistance from a Qualified Individual, designated by the governing body of a Tribe or Indigenous culture, to evaluate the designated planning area, then gather knowledge about indigenous knowledge, and deliver results to the client and NRCS. The resulting information can be used to inform the conservation planning and implementation processes, meet the client's objectives by addressing one or more NRCS-recognized resource concerns using techniques that align with Tribal or Indigenous knowledge.

Before Situation:

Through the NRCS conservation planning process, a conservation planner has identified client objectives for addressing natural resource concerns (Soil, Water, Animals, Plants, Air + Energy) and socio-economic considerations such as increasing capacity for

After Situation:

The client hired a QI to provide the CEMA assistance. The QI has met with client and visited the planning area, in order to develop an understanding of its capabilities, limitations, and needs within a culturally appropriate context. Indigenous knowledge about the planning area has been gathered from sources approved by a Tribe or Indigenous culture. The QI verifies with the Tribe's or Indigenous culture's governing body, that the information gathered is accurate- then provides a report, map and other supporting documentation of their ISM evaluation of the planning area to the client; and a copy is shared with NRCS. In the future, the information this CEMA provides can assists the participant and the planner refine conservation objectives; and realize opportunities to incorporate Indigenous knowledge into a conservation plan and/or conservation practice implementations.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $22,953.76

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $22,953.76

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 222 - Indigenous Stewardship Methods Evaluation

Scenario: #34 - Indigenous Knowledge, Less Than or Equal to 10 Acres

Scenario Description:

The scenario involves obtaining assistance from a Qualified Individual, designated by the governing body of a Tribe or Indigenous culture, to evaluate the designated planning area, then gather knowledge about indigenous knowledge, and deliver results to the client and NRCS. The resulting information can be used to inform the conservation planning and implementation processes, meet the client's objectives by addressing one or more NRCS-recognized resource concerns using techniques that align with Tribal or Indigenous knowledge.

Before Situation:

Through the NRCS conservation planning process, a conservation planner has identified client objectives for addressing natural resource concerns (Soil, Water, Animals, Plants, Air + Energy) and socio-economic considerations such as increasing capacity for

After Situation:

The client hired a QI to provide the CEMA assistance. The QI has met with client and visited the planning area, in order to develop an understanding of its capabilities, limitations, and needs within a culturally appropriate context. Indigenous knowledge about the planning area has been gathered from sources approved by a Tribe or Indigenous culture. The QI verifies with the Tribe's or Indigenous culture's governing body, that the information gathered is accurate- then provides a report, map and other supporting documentation of their ISM evaluation of the planning area to the client; and a copy is shared with NRCS. In the future, the information this CEMA provides can assists the participant and the planner refine conservation objectives; and realize opportunities to incorporate Indigenous knowledge into a conservation plan and/or conservation practice implementations.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,102.19

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,102.19

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 222 - Indigenous Stewardship Methods Evaluation

Scenario: #50 - Indigenous Knowledge, 11 to 300 Acres

Scenario Description:

The scenario involves obtaining assistance from a Qualified Individual, designated by the governing body of a Tribe or Indigenous culture, to evaluate the designated planning area, then gather knowledge about indigenous knowledge, and deliver results to the client and NRCS. The resulting information can be used to inform the conservation planning and implementation processes, meet the client's objectives by addressing one or more NRCS-recognized resource concerns using techniques that align with Tribal or Indigenous knowledge.

Before Situation:

Through the NRCS conservation planning process, a conservation planner has identified client objectives for addressing natural resource concerns (Soil, Water, Animals, Plants, Air + Energy) and socio-economic considerations such as increasing capacity for

After Situation:

The client hired a QI to provide the CEMA assistance. The QI has met with client and visited the planning area, in order to develop an understanding of its capabilities, limitations, and needs within a culturally appropriate context. Indigenous knowledge about the planning area has been gathered from sources approved by a Tribe or Indigenous culture. The QI verifies with the Tribe's or Indigenous culture's governing body, that the information gathered is accurate- then provides a report, map and other supporting documentation of their ISM evaluation of the planning area to the client; and a copy is shared with NRCS. In the future, the information this CEMA provides can assists the participant and the planner refine conservation objectives; and realize opportunities to incorporate Indigenous knowledge into a conservation plan and/or conservation practice implementations.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $9,412.80

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9,412.80

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 223 - Forest Management Assessment

Scenario: #2 - Nonindustrial Private Forest, Less Than or Equal to 20 Acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 1 to 20 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow

After Situation:

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $847.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $847.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 223 - Forest Management Assessment

Scenario: #18 - Nonindustrial Private Forest, 21 to 100 Acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 21 to 100 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow

After Situation:

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,610.05

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,610.05

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 223 - Forest Management Assessment

Scenario: #34 - Nonindustrial Private Forest, 101 to 250 Acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 101 to 250 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow

After Situation:

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,050.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,050.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 223 - Forest Management Assessment

Scenario: #50 - Nonindustrial Private Forest, 251 to 500 Acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 251 to 500 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow

After Situation:

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,575.93

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,575.93

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 223 - Forest Management Assessment

Scenario: #66 - Nonindustrial Private Forest, 501 to 1,000 Acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 501 to 1000 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow

After Situation:

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,762.28

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,762.28

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 223 - Forest Management Assessment

Scenario: #82 - Nonindustrial Private Forest, Greater Than 1,000 Acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 1001 acres or greater in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow

After Situation:

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,711.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,711.29

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 224 - Aquifer Flow Test

Scenario: #3 - Aquifer Testing

Scenario Description:

The typical scenario supports the utilization of an existing or planned vertical turbine or submersible pump in an existing or planned water well for pressurizing an irrigation or stockwater system where water well flow rate is unknown. An aquifer flow test (e.g., step drawdown or constant rate) will be done to determine the flow rate from the well and select a pumping plant to match the pumping requirements of the irrigation or livestock system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water for livestock - Inefficient use of irrigation water; inefficient energy use. Associated Practices: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Micro-irrigation; 449 - Irrigation Water Management, 642 - Water Well, 516 - Livestock Pipeline

Before Situation:

Livestock or irrigation system is delivering insufficient water due to unknown volume and flow rate of the aquifer.

After Situation:

With the completion of the aquifer flow test, a known flow rate of the well will determine the correct flow rate and TDH on which a pump can be selected to support an irrigation of stockwater system.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,404.94

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,404.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 226 - Waste Facility Site Suitability and Feasibility Assessment

Scenario: #2 - Non-Dairy Livestock Operations, Onsite Evaluation for Planned Storage

Scenario Description:

Non-Dairy livestock operation. A Qualified Individual will conduct an onsite investigation. Soil data collection, investigation and interpretation of the properties and characteristics, results of tests and samples will be used to determine the appropriateness of the site for the storage facility. Scenario based on one proposed location for the planned storage.

Before Situation:

A waste storage, handling or treatment facility is planned for the operation. The proposed location has not be investigated for determination of suitability and feasibility.

After Situation:

An onsite investigation for soil properties and characteristics was conducted. The proposed location met the criteria to allow the type and size of the planned storage facility. The report documents all data and results.

Feature Measure: One site evaluated

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,399.31

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,399.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 226 - Waste Facility Site Suitability and Feasibility Assessment

Scenario: #18 - Dairy Livestock Operations, Onsite Evaluation for Planned Storage

Scenario Description:

Livestock operation is Dairy. A Qualified Individual will conduct an onsite investigation. Soil data collection, investigation and interpretation of the properties and characteristics, results of tests and samples will be used to determine the appropriateness of the site for the storage facility. Scenario based on one proposed location for the planned storage.

Before Situation:

A waste storage, handling or treatment facility is planned for the operation. The proposed location has not be investigated for determination of suitability and feasibility.

After Situation:

An onsite investigation for soil properties and characteristics was conducted. The proposed location met the criteria to allow the type and size of the planned storage facility. The report documents all data and results.

Feature Measure: One site evaluated

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,746.99

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,746.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 227 - Evaluation of Existing Waste Storage Facility Components

Scenario: #2 - Livestock Operation, One to Two Components

Scenario Description:

A Qualified Individual conducts an on-site investigation of up to 2 manure and wastewater handling and storage structures and equipment at the facilities where the livestock are housed. The investigation report will determine whether or not an existing component is in good operating condition. Typical evaluation of 1-2 storage structures, collection, may include pump.

Before Situation:

A waste storage facility and associated equipment is in use on the production area. The existing structure has not been evaluated for good operating condition. New or expanded waste storage and handling facilities could fail is the existing structure is n

After Situation:

The Qualified Individual concludes that the existing storage components are in good working order OR has identified the component needs corrective. The CEMA report contains all data and recommendations.

Feature Measure: Per Production Site structur

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,908.89

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,908.89

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 227 - Evaluation of Existing Waste Storage Facility Components

Scenario: #18 - Livestock Operation, Three to Five Components

Scenario Description:

A Qualified Individual conducts an on-site investigation of all manure and wastewater handling and storage structures and equipment at the facilities where the livestock are housed. The investigation report will determine whether or not an existing component is in good operating condition. Typical livestock production site has 2-5 storage and collection structures and may include pump.

Before Situation:

A waste storage facility and associated equipment is in use on the production area. The existing structure has not been evaluated for good operating condition. New or expanded waste storage and handling facilities could fail is the existing structure is n

After Situation:

The Qualified Individual concludes that the existing storage components are in good working order OR has identified the component needs corrective. The CEMA report contains all data and recommendations.

Feature Measure: Per Operation 2-5 Structure

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,618.85

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,618.85

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 227 - Evaluation of Existing Waste Storage Facility Components

Scenario: #34 - Livestock Operation, Greater Than Five Components

Scenario Description:

A Qualified Individual conducts an on-site investigation of all manure and wastewater handling and storage structures and equipment at the facilities where the livestock are housed. The investigation report will determine whether or not an existing component is in good operating condition. Typical livestock production site has 5 or more storage and collection structures and pump(s).

Before Situation:

A waste storage facility and associated equipment is in use on the production area. The existing structure has not been evaluated for good operating condition. New or expanded waste storage and handling facilities could fail is the existing structure is n

After Situation:

The Qualified Individual concludes that the existing storage components are in good working order OR has identified the component needs corrective. The CEMA report contains all data and recommendations.

Feature Measure: Per Operation Structures

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,970.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,970.24

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 228 - Agricultural Energy Assessment

Scenario: #2 - Large, Three Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 3 enterprises where at least I consists of > 2500 acres of crops, > 1000 animal units, more than 6 irrigation pumps, or > 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Large operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire opera

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,476.77

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8,476.77

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 228 - Agricultural Energy Assessment

Scenario: #18 - Large, Greater Than or Equal to Four Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 4 or more enterprises where at least I consists of > 2500 acres of crops, > 1000 animal units, more than 6 irrigation pumps, or > 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Large operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire opera

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $10,156.14

Total Cost per Unit: $10,156.14

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 228 - Agricultural Energy Assessment

Scenario: #34 - Large, Two Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 2 enterprises where at least I consists of > 2500 acres of crops, > 1000 animal units, more than 6 irrigation pumps, or > 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Large operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire opera

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,797.40

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,797.40

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 228 - Agricultural Energy Assessment

Scenario: #50 - Medium, Greater Than or Equal to Four Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 4 or more enterprises where at least I consists of 301 to 2500 acres of crops, < 301 to 1000 animal units, 3 - 6 irrigation pumps, or 20,001 to 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Medium operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire opera

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,930.59

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8,930.59

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 228 - Agricultural Energy Assessment

Scenario: #66 - Small, Greater Than or Equal to Four Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 4 or more enterprises where 1 is not larger than < 300 acres of crops, < 300 animal units, 1 - 2 irrigation pumps, < 20,000 sq. ft. of heated greenhouse, or maple syrup processing. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Small operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire opera

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,918.84

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,918.84

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 228 - Agricultural Energy Assessment

Scenario: #82 - Medium, Three Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 3 enterprises where at least I consists of 301 to 2500 acres of crops, < 301 to 1000 animal units, 3 - 6 irrigation pumps, or 20,001 to 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Medium operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire opera

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,251.21

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,251.21

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 228 - Agricultural Energy Assessment

Scenario: #98 - Small, Three Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 3 enterprises where 1 is not larger than < 300 acres of crops, < 300 animal units, 1 - 2 irrigation pumps, < 20,000 sq. ft. of heated greenhouse, or maple syrup processing. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Small operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire opera

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,239.46

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,239.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 228 - Agricultural Energy Assessment

Scenario: #114 - Medium, Two Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 2 enterprises where at least I consists of 301 to 2500 acres of crops, < 301 to 1000 animal units, 3 - 6 irrigation pumps, or 20,001 to 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Medium operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire opera

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,571.84

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,571.84

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 228 - Agricultural Energy Assessment

Scenario: #130 - Small, Two Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 2 enterprises where 1 is not larger than < 300 acres of crops, < 300 animal units, 1 - 2 irrigation pumps, < 20,000 sq. ft. of heated greenhouse, or maple syrup processing. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Small operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire opera

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,560.09

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,560.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 228 - Agricultural Energy Assessment

Scenario: #146 - Large, One Enterprise

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has either > 2500 acres of crops, > 1000 animal units, more than 6 irrigation pumps, or > 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. A large operation is described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire opera

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,118.03

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,118.03

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 228 - Agricultural Energy Assessment

Scenario: #162 - Medium, One Enterprise

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has either 301 to 2500 acres of crops, < 301 to 1000 animal units, 3 - 6 irrigation pumps, or 20,001 to 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. A medium operation is described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire opera

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,892.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,892.47

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 228 - Agricultural Energy Assessment

Scenario: #178 - Small, One Enterprise

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has either < 300 acres of crops, < 300 animal units, 1 - 2 irrigation pumps, < 20,000 sq. ft. of heated greenhouse, or maple syrup processing. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. A small operation is described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire opera

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,880.72

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,880.72

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 309 - Agrichemical Handling Facility

Scenario: #1 - Enclosed Building

Scenario Description:

This practice scenario is an agrichemical handling facility for storage and mixing and loading operations. This practice addresses water quality degradation and due to mis-handling, storing and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Roof Runoff Management (558), Nutrient Management (590), Pest Management (595)

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground

After Situation:

An agrichemical storage and handling facility is constructed inside an enclosed building. The average size of the agrichemical handling facility for storage and mixing and loading is 18' x 24' with an application equipment length of 16 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading with proper storage of associated dry and/or liquid agrichemicals. The concrete is sealed and sloped to a collection sump, facility containment is surrounded by square and ramped curbs. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Total Containment Area

Scenario Unit: Square Foot

Scenario Typical Size: 432.0

Scenario Total Cost: $22,743.28

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $52.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 309 - Agrichemical Handling Facility

Scenario: #2 - Pad Under a Roof

Scenario Description:

This practice scenario is an agrichemical handling facility for mixing and loading operations. This practice addresses water quality degradation and due to mis-handling, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground

After Situation:

This scenario is an agrichemical handling facility pad is constructed with a roof. The average size of the agrichemical handling pad for mixing and loading is 18' x 24' with an application equipment length of 16 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading. The concrete is sealed and sloped to a collection sump, containment of the pad is surrounded by sloped and ramped reinforced concrete. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Total Containment Area

Scenario Unit: Square Foot

Scenario Typical Size: 432.0

Scenario Total Cost: $18,858.74

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $43.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 309 - Agrichemical Handling Facility

Scenario: #3 - Pad for Mixing and Loading

Scenario Description:

This practice scenario is an agrichemical handling facility for mixing and loading operations. This practice addresses water quality degradation and due to mis-handling, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Nutrient Management (590), Pest Management (595)

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground

After Situation:

This scenario is an agrichemical handling facility pad for mixing and loading operations. The average size of the agrichemical handling pad for mixing and loading is 18' x 24' with an application equipment length of 16 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading. The concrete is sealed and sloped to a collection sump, containment of the pad is surrounded by sloped and ramped reinforced concrete. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Total Containment Area

Scenario Unit: Square Foot

Scenario Typical Size: 432.0

Scenario Total Cost: $11,510.42

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $26.64

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 311 - Alley Cropping

Scenario: #1 - Single Row

Scenario Description:

The crop or grass land is planted with rows of trees to increase crop diversity. Final row width, and spacing of trees within the row, is based on farm equipment size, growth form of trees, light needs of annual crop or grass, and intent of the landowner. The resource concerns are plant condition - inadequate structure and composition.

Before Situation:

The landscape has been cropped or in perennial grass for many years. It is void of any perennial tree vegetation. On cropland site preparation needs may need deep ripping to eliminate any plow pan and on grass land competing vegetation control is accompli

After Situation:

Trees have been established to diversify the crop production of the field. Typically the area planted is 10 acres on approximately 12 x 40 foot spacing.

Feature Measure: planted seedling

Scenario Unit: Each

Scenario Typical Size: 900.0

Scenario Total Cost: $37,374.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $41.53

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 311 - Alley Cropping

Scenario: #2 - Three Row Sets

Scenario Description:

Cropland is planted with trees in 3-row sets with 40 foot alleyways in between. The outside rows of trees are conifers and the center row a mast-producing high-value hardwood timber species. Between row spacing is 16 feet and between tree spacing is 10 feet. The resource concerns are Plant Condition - inadequate structure and composition; Soil Erosion (wind); Excess/ Insufficient Water (inefficient moisture management); Inadequate Habitat for Fish and Wildlife (food, cover/shelter, continuity).

Before Situation:

The landscape has been cropped for many years. It is void of any perennial tree vegetation. Wind erosion is evident, insufficient water for crops occurs due to excessive winds, wildlife habitat score is very low due to the lack of any perennial vegetation

After Situation:

Trees have been established to diversify the crop production, reduce erosion by wind and water and improve growing conditions for crops in alleyways. Typically the area planted is 10 acres.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $9,032.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $903.27

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 311 - Alley Cropping

Scenario: #270 - Single Row, Less Than or Equal to Five Acres

Scenario Description:

The crop or grass land is planted with rows of trees to increase crop diversity. Final row width, and spacing of trees within the row, is based site size, growth form of trees, light needs of annual crop or grass, and intent of the landowner. The resource concerns are plant condition - inadequate structure and composition.

Before Situation:

The landscape has been cropped or in perennial grass for many years. It is void of any perennial tree vegetation. On grassland competing vegetation control is accomplished prior to tree planting.

After Situation:

Trees have been established to diversify crop production of the field. Typically the area planted is less than 5 acres on approximately 12 x 40 foot spacing.

Feature Measure: Planted Seedling

Scenario Unit: Each

Scenario Typical Size: 450.0

Scenario Total Cost: $14,069.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $31.27

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #1 - Earthen Storage, Less Than or Equal to 50,000 Cubic Feet

Scenario Description:

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of less than 50,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) to adequately protect liner at agitation and access points. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Solid/Liquid Waste Separation Facility (632), Waste Treatment (629) .

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled

After Situation:

An earthen storage structure constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : design storage volume 25,000 ft3; 87'X87' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 9.5' (design depth = 8'); (not include in volume - 1' freeboard and 0.5' sludge accumulation).

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 25,000.0

Scenario Total Cost: $9,438.09

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #2 - Earthen Storage, Greater Than 50,000 Cubic Feet

Scenario Description:

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of more than 50,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) to adequately protect liner at agitation and access points. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), Solid/Liquid Waste Separation Facility (632), and Waste Treatment (629).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facility. Manure and other agricultural waste by-products are not being utilized or controlled i

After Situation:

An earthen storage structure constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size: design storage volume 168,000 ft3; 157'X162' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 13' 8" (design depth = 12'); (not included in volume - 1' freeboard and 8" sludge accumulation).

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 168,000.0

Scenario Total Cost: $45,141.60

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.27

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #5 - Dry Stack with Earthen Floor and Wood Walls

Scenario Description:

This scenario consists of a dry stack facility with compacted earthen floor with wooden walls and posts. This scenario is intended for drier material such as poultry litter. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This scenario is applicable where geological, soil, and climate conditions are appropriate for earth floors and are allowed by state and local regulations. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source or other location or are being transported off the farm without proper utilization or dispos

After Situation:

Manure and other agricultural by-products are controlled by the collection at the source and stored temporarily at an environmentally suitable location until such time that they are removed from the farm or utilized in a proper manner in accordance with a nutrient management plan. The typical size is 4,000 SqFt (40' x 100'). The earthen floor will be prepared by stripping the top 1' of soil and roller compacting it back in place to make the floor. Walls are 5'0" high, pressure treated wood (2" x 6" boards) with 6" x 6" x 8' posts set 4' c-c. Walls allow for greater storage volume. Walls are placed on three sides of the building with one short side open. Construction includes excavation and compaction of top 1' of earth material, setting posts, and installing wooden walls.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $11,360.53

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.84

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #6 - Dry Stack with Earthen Floor and Concrete Walls

Scenario Description:

This scenario consists of a dry stack facility with compacted earthen floor with concrete walls. This scenario is intended for drier material such as poultry litter. Concrete walls are needed for situations where backfill will be placed against the wall or on sites where the requirements of organic certification preclude the use of wooden walls. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This scenario is applicable where geological, soil, and climate conditions are appropriate for earth floors and are allowed by state and local regulations. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source or other location or are being transported off the farm without proper utilization or dispos

After Situation:

Manure and other agricultural by-products are controlled by the collection at the source and stored temporarily at an environmentally suitable location until such time that they are removed from the farm or utilized in a proper manner in accordance with a nutrient management plan. The typical size is 4,000 SqFt (40' x 100'). The earthen floor will be prepared by stripping the top 1' of soil and roller compacting it back in place to make the floor. Walls are 5' high concrete. Walls allow for greater storage volume. (Concrete walls are 8" wide and 6'6" high on a 1'x 3.5' footer buried 18" below grade.) Walls are placed on three sides of the building with one short side open. Construction includes excavation and compaction of top 1' of earth material and installing concrete walls.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $45,059.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #7 - Dry Stack with Concrete Floor and No Walls

Scenario Description:

This scenario consists of a dry stack facility with reinforced concrete floor without side walls. This scenario is intended for situations where consistency of manure or geographical conditions prohibit earthen floors. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source or other location or are being transported off the farm without proper utilization or dispos

After Situation:

Manure and other agricultural by-products are controlled by collection at the source and are stored temporarily at an environmentally suitable location until such time that they are removed from the farm or are utilized in a proper manner in accordance with a nutrient management plan. The typical size is 4,000 SqFt (40' x 100'). The facility floor is 5" reinforced concrete without side walls. Manure and other agricultural by-products are controlled by collection at the source and stored temporarily at an environmentally suitable location until such time that they are disposed of or utilized in a proper manner in accordance with a nutrient management plan. Construction includes topsoil removal (0.5'), placement of compacted gravel (4"), and installation of reinforced concrete (5").

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $35,884.59

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.97

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #8 - Dry Stack with Concrete Floor and Wood Walls

Scenario Description:

This scenario consists of a dry stack facility with reinforced concrete floor with pressure treated wood walls. This scenario is intended for situations where consistency of manure or geographical conditions prohibit earthen floors. The purpose of this practice is to temporarily, properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source or other location or are being transported off the farm without proper utilization or dispos

After Situation:

Manure and other agricultural by-products are controlled by the collection at the source and stored temporarily at an environmentally suitable location until such time that they are removed from the farm or utilized in a proper manner in accordance with a nutrient management plan. The typical size is 4,000 SqFt (40' x 100'). Walls are 5'0" high, pressure treated wood (2" x 6" boards) with 6" x 6" x 8' posts set 4' c-c. Walls allow for greater storage volume. Walls are placed on three sides of the building with one short side open. The facility floor is 5" reinforced concrete. Construction includes excavation and removal of top 0.5' of topsoil, setting posts, and installing concrete floor and wooden walls.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $42,587.70

Total Cost per Unit: $10.65

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #9 - Dry Stack with Concrete Floor and Walls

Scenario Description:

This scenario consists of a dry stack facility with reinforced concrete floor and concrete walls. This scenario is intended for situations where consistency of manure or geographical conditions prohibit earthen floors. Concrete walls are needed for situations where backfill will be placed against the wall or on sites where the requirements of organic certification preclude the use of wooden walls. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source or other location or are being transported off the farm without proper utilization or dispos

After Situation:

Manure and other agricultural by-products are controlled by the collection at the source and stored temporarily at an environmentally suitable location until such time that they are removed from the farm or utilized in a proper manner in accordance with a nutrient management plan. The typical size is 4,000 SqFt (40' x 100'). Walls are 5' high concrete. Walls allow for greater storage volume. (Concrete walls are 8" wide and 6'6" high on a 1'x 3.5' footer buried 18" below grade.) Walls are placed on three sides of the building with one short side open. Construction includes removal of 0.5' of topsoil, installation of 4" of gravel, and installing concrete floor (5") and walls.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $80,353.66

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $20.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #10 - Tank, Less Than 5,000 Cubic Feet

Scenario Description:

This scenario consists of installing a small concrete tank with a design storage volume of less than 5,000 CF that is totally or partially buried and has a solid lid with several openings for direct loading from a heavy use area, gutter cleaner or gravity pipe. Manure is held for 3 to 14 day on smaller operations or transferred to larger storage facility or direct land applied. Design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), Pumping Plant (533),and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This

After Situation:

Manure and other agricultural by-products are controlled by collection at the source and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, in accordance with a nutrient management plan. This practice will address soil and water quality by reducing pollution potential to soil, surface water, and ground water. The tank is typically 8' deep x 12' wide x 40' long with a design storage volume of 3,600 cubic feet plus 6" freeboard and a concrete top. Sizing based on manure, other wastes, rainfall, lot runoff, etc. Volume does not include 6" of freeboard. Tanks associated with open lots will be sized to handle design storm in tank or in combination with lot as per state regulations. Sitework includes excavation of tank footprint, placement of compacted gravel (5"), pouring concrete floor, walls, and top, and backfilling around the tank. Tank is buried flush with ground.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 3,600.0

Scenario Total Cost: $33,578.55

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9.33

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #11 - Tank, 5,000 to 14,999 Cubic Feet

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 5,000 to 14,999 CF that is totally or partially buried and has an open top. The tank can also be under an animal facility with the top cover of either slats or solid concrete lid/floor. Design volume does not include freeboard. Potential Associated Practices: , Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source or other location or are being transported but not properly utilized or disposed of. This si

After Situation:

Manure and other agricultural by-products are collected at the source and are stored temporarily at an environmentally suitable location until such time that they are disposed of or utilized in a proper manner in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil and to surface and ground water. The tank is typically 8' deep, with a bottom area of 1256 SF, and a design storage volume of 9,420 cubic feet plus 6" freeboard (40' diameter). Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Volume does not include 6" of freeboard. Site preparation includes excavation of tank footprint, placement of gravel (5"), and total excavation of 6.5'. Construction includes pouring the concrete wall and floor and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 9,420.0

Scenario Total Cost: $34,872.45

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #12 - Tank, 15,000 to 24,999 Cubic Feet

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 15,000 to 24,999 CF. The tank is totally or partially buried and has an open top. It can be under an animal facility with the top cover being slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), Pumping Plant (533) and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil and to surface and ground water. Tank is typically 8 ft deep, with a bottom area of 2,667 sq.ft., and a design storage volume of 20,000 cubic feet plus 6” freeboard (58.5' diameter). Size based on design volume of manure, other wastes, rainfall, lot runoff, etc. as appropriate and does not include the 6” of freeboard. Site preparation includes excavation of tank footprint, placement of gravel (5"), and total excavation of 6.5'. Construction includes pouring the concrete wall and floor and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 20,000.0

Scenario Total Cost: $58,101.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.91

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #13 - Tank, 25,000 to 49,999 Cubic Feet

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 25,000 to 49,999 CF. Tank is totally or partially buried and has an open top. Tank can be under a animal facility with the top cover being slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This

After Situation:

Manure and other agricultural by-products are controlled by the collection at the source and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil and to surface and ground water. Tank installed is 10' deep with a bottom area of 2,947 SF, and a design storage volume of 28,000 cubic feet plus 6" freeboard (diameter 61.3'). Size based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Calculated volume for scenario does not include the 6” of freeboard. Site preparation includes excavation of tank footprint, placement of gravel (5"), and total excavation of 8'. Construction includes pouring the concrete wall and floor and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 28,000.0

Scenario Total Cost: $77,328.96

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.76

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #14 - Tank, 50,000 to 74,999 Cubic Feet

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 50,000 to 74,999 CF. Tank is totally or partially buried and has an open top, however it can be under a animal facility with the top cover with slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil and to surface and ground water. Tank typically 12' deep, with a bottom area of 5,391 SF, and a design storage volume of 62,000 cubic feet plus 6" freeboard. (Diameter 82.9') Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Volume does not include 6" of freeboard. Site preparation includes excavation of tank footprint, placement of gravel (5"), and total excavation of 10'. Construction includes pouring the concrete wall and floor and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 62,000.0

Scenario Total Cost: $134,087.01

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.16

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #15 - Tank, 75,000 to 110,000 Cubic Feet

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 75,000 to 109,999 CF. Tank is totally or partially buried and has an open top. Tank can also be under an animal facility with the top cover using slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Pipeline (516), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank typically 12' deep, with a bottom area of 8,044 SF, and a storage capacity of 92,500 cubic feet plus 6" freeboard. (Diameter 101.2') Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Volume does not include 6" of freeboard. Site preparation includes excavation of tank footprint, placement of gravel (5"), and total excavation of 10'. Construction includes pouring the concrete wall and floor and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 92,500.0

Scenario Total Cost: $179,178.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #16 - Tank, Greater Than 110,000 Cubic Feet

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume of 110, 000 or more CF. Tank is totally or partially buried and has an open top. Tank can also be under a animal facility with the top cover using slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Pipeline (516), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil and to surface and ground water. Tank typically 14' deep with a bottom area of 11,304 SF and a design storage volume of 152,600 CF plus 6" freeboard. (Diameter = 120') Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Volume does not include 6" of freeboard. Site preparation includes excavation of tank footprint, placement of gravel (5"), and total excavation of 12'. Construction includes pouring the concrete wall and floor and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 152,600.0

Scenario Total Cost: $275,201.69

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.80

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 313 - Waste Storage Facility

Scenario: #39 - Composted Bedded Pack, Concrete Floor and Walls

Scenario Description:

A composted bedded pack facility is constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario is intended for situations where consistency of manure or geological conditions prohibit the use of earthen floors. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Fence (382), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558) and Underground Outlet (620).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled

After Situation:

Using a bedded pack provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Typical design: floor area 4,000 ft2, (40' X 100'); 4' concrete wall height, 3' footing depth with a 6" concrete floor; 20' openings on each end of structure. Site preparation includes excavation of bedded pack area and concrete wall trench, gravel placement for concrete floor (4"), pouring concrete floor and wall, and backfilling around the wall.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $66,775.06

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $16.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #1 - Mechanical Control, Hand Application

Scenario Description:

Using hand tools, such as axes, shovels, hoes, nippers, brush pullers, and including chainsaws to cut off woody plants at or below the root collar (autumn olive, bush honeysuckle, multifora rose and privet typical targets). Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have stands of woody and non herbaceous species that are in the early phases of invasions. Typical unit is 25 acres.

Before Situation:

Area is in the very early phases of woody non herbaceous species encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased s

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition continues to progressing in an upward trend, hydrology and plant health and vigor are sustained.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 25.0

Scenario Total Cost: $6,324.01

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $252.96

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #2 - Mechanical, 10 to 20 Percent Infestation

Scenario Description:

Removal of large woody vegetation of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by pushing, grubbing, masticating, chaining and then raking or piling in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at 10-20% (light) infestation. Typical unit is 30 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $5,106.07

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $170.20

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #3 - Mechanical, 21 to 50 Percent Infestation

Scenario Description:

Removal of large woody vegetation of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by pushing, grubbing, masticating, chaining and then raking or piling in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at 20% – 50% (medium) infestation. Typical unit is 30 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $8,221.88

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $274.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #4 - Mechanical, Greater Than 50 Percent Infestation

Scenario Description:

Removal of large woody vegetation of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by pushing, grubbing, masticating, chaining and then raking or piling in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at >50% (heavy) infestation. Typical unit is 30 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $10,319.35

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $343.98

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #5 - Mechanical and Chemical Control

Scenario Description:

Removal of woody vegetation of light-medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by the use of mechanical cutter, chopper or other light equipment followed by an application of low cost chemicals in low volumes of material in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium infestation rate. Typical unit is 30 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed and burned to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $9,334.44

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $311.15

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #7 - Chemical Control, Individual Plant Treatment

Scenario Description:
This Practice is for the implementation of brush management on range, pasture or native pasture using Individual Plant Treatment (IPT). The typical method of control is application of herbicides (basal or foliar location) on selected individual plants.

Before Situation:
Brush species exceed desired levels resulting in degraded plant condition, loss of forage production, or degraded wildlife habitat. Densities of brush exceed levels indicated in the ecological site descriptions.

After Situation:
Brush has been treated to a level which results in improved plant condition, forage production, or wildlife habitat. The typical method of control is application of herbicides (basal or foliar location) on selected individual plants.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $2,924.13

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $97.47

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #8 - Chemical Control, Ground Application

Scenario Description:

Apply brush management on 30 acres of rangeland, grazed forest, or pasture thru the use of broadcast application of material using low cost chemical(s) to reduce or remove undesirable deciduous species (brush) in uplands and other areas not in or directly adjacent to streams, ponds, or wetlands.

Before Situation:

Plant, animal, or wildlife resource concerns associated with uplands and other areas not in or adjacent to stream, ponds, or wetland on grazed range, grazed forest, or pasture which are adversely affected by brush.

After Situation:

A 30 acre unit of pasture, grazed range, or grazed forest where reduction or removal of undesirable deciduous species have been accomplished by broadcast or spot treatment chemical application to address plant, animal, and wildlife resource concerns.

Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $2,430.72

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $81.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #9 - Chemical Control, Aerial Application

Scenario Description:

Apply brush management on 80 acres of rangeland, grazed forest, or pasture thru the use of broadcast aerial application of material with low cost chemical(s) to reduce or remove undesirable deciduous species (brush) in uplands and other areas not in or directly adjacent to streams, ponds, or wetlands.

Before Situation:

Plant, animal, or wildlife resource concerns associated with uplands and other areas not in or adjacent to stream, ponds, or wetland on grazed range, grazed forest, or pasture which are adversely affected by brush.

After Situation:

A 80 acre unit of pasture, grazed range, or grazed forest where reduction or removal of undesirable deciduous species have been accomplished by broadcast or spot treatment chemical application to address plant, animal, and wildlife resource concerns.

Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 80.0

Scenario Total Cost: $3,987.08

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $49.84

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #11 - Mechanical Control, Bush Hog

Scenario Description:

Removal of small woody vegetation of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by the use of mechanical cutter, chopper or other light equipment in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at a light infestation. Typical unit is 10 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres Planned

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $524.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $52.48

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #12 - Mechanical and Chemical Control, Stump

Scenario Description:

Removal of medium-heavy infestations of woody invasives on generally B & C slopes, typically limestone soils. The practice entails the removal of brush by the use of chainsaw or mechanical cutter, followed by a direct application of low cost chemical herbicide to prevent resprouting. Purpose is to promote natural regeneration, reduce fuel loading, and improve ecological site condition. Brush density and canopy has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium to heavy infestation rate. Typical unit is 20 acres.

Before Situation:

Area consists of medium to heavy infestation of woody invasive species that are adversely affecting natural regeneration, promoting noxious and invasive species and degrading wildlife habitat. Resource concern is Degraded Plant Condition - Excessive Plant

After Situation:

Woody species are removed to achieve the desired natural regeneration of the plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat is achieved.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $9,669.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $483.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #13 - Mechanical Control, Grapevines

Scenario Description:

General laborer is hired to hand cut 100-175 grapevines/acre in a closed canopy pole-sized hardwood stand with an axe or machete at a point one to four feet above the ground to deaden the vine and stop current damage and prevent future damage to the crowns of high quality trees. The closed canopy provides shade that will sufficiently limit regrowth of severed vines. All vines will not be treated as those in non-crop trees will be left as a wildlife food source. Resource concern is Degraded Plan Condition - Undesirable Plant Productivity and Health. Typical stand size is 20 acres.

Before Situation:

Hardwood stands with co-dominant trees that are greater than 15 feet tall and having a red oak site index of 60 or more and a closed canopy with 100-175 grapevines/acre extending from the ground into the crowns of high quality crop trees limiting the crow

After Situation:

The applied treatment results in the improved health, productivity and vigor of 40-100 trees per acre which have had the grapevines deadened. Ninety percent control of the treated vines is expected. Continued operation and maintenance activities should eventually result in complete control of the targeted vines.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $1,915.43

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $95.77

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #14 - Cut Stump with Two-Year Follow-up Treatment

Scenario Description:

The practice entails the control of woody vegetation by treating it up to three times with chemical ground application during the multi-year treatment period in order to improve ecological site condition. The brush can be treated with the same method or by a combination of methods. Woody vegetation needs to be treated at least twice in order to fully control it. Generally, herbicide volumes are reduced as the last treatment will kill resprouting stems or those which survived the first treatment or newly sprouted seedlings. Brush density has exceeded desired levels based on ecological site potential. Removal of heavy infestations of woody invasives on generally B & C slopes, typically limestone soils. The practice entails the removal of brush by the use of chainsaw or mechanical cutter, followed by a direct application of low cost chemical herbicide to prevent resprouting. Resprouting occurs on approximately 5 acres the year after initial treatment and follow-up spray is required. Resprouting occurs on 2 acres the second year after initial treatment and follow-up spray is required. After that time any remaining resprouting can be controlled through operation and maintenance activities. Purpose is to promote natural regeneration, reduce fuel loading, and improve ecological site condition. Brush density and canopy has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium to heavy infestation rate. Typical unit is 20 acres.

Before Situation:

Area consists of heavy infestation of woody invasive species that are adversely affecting natural regeneration, promoting noxious and invasive species and degrading wildlife habitat. Resource concern is Degraded Plant Condition - Excessive Plant Pressure.

After Situation:

Woody species are removed to achieve the desired natural regeneration of the plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat is achieved.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $12,077.90

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $603.89

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #15 - Chemical Control, Multi-Year Application

Scenario Description:

The practice entails the control of woody vegetation by treating it up to three times with chemical ground application during the multi-year treatment period in order to improve ecological site condition. The brush can be treated with the same method or by a combination of methods. Sweetgum and Sycamore in early successional habitat management areas need to be treated with three chemical ground applications in order to fully control it. Generally, herbicide volumes are reduced as the last treatment will kill resprouting stems or those which survived the first treatment or newly sprouted seedlings. Brush density has exceeded desired levels based on ecological site potential. Removal of heavy infestations of woody invasives on generally B & C slopes, typically limestone soils. The practice entails the removal of brush by the use of chainsaw or mechanical cutter, followed by a direct application of low cost chemical herbicide to prevent resprouting. Resprouting occurs on approximately 5 acres the year after initial treatment and follow-up spray is required. Resprouting occurs on 2 acres the second year after initial treatment and follow-up spray is required. After that time any remaining resprouting can be controlled through operation and maintenance activities. Purpose is to promote natural regeneration, reduce fuel loading, and improve ecological site condition. Brush density and canopy has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium to heavy infestation rate. Typical unit is 10 acres.

Before Situation:

Area consists of heavy infestation of woody invasive species that are adversely affecting natural regeneration, promoting noxious and invasive species and degrading wildlife habitat. Resource concern is Degraded Plant Condition - Excessive Plant Pressure.

After Situation:

Woody species are removed to achieve the desired natural regeneration of the plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat is achieved.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $6,209.61

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $620.96

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #16 - Frill and Spray

Scenario Description:

This practice is for the implementation of brush management on forest land using the hack and squirt method. The typical method of control is cutting or "frilling" around the entire diameter of an invasive tree such as tree-of-heaven with an axe and then spraying a herbicide such as imazapyr thoroughly wetting the frilled area. Infested area is typically located away from the farm headquarters. Acreage is based on 100% infestation - typical infestation is 5 acres.

Before Situation:

Invasive tree species exceed desired levels resulting in degraded plant condition, loss of timber production, or degraded wildlife habitat. Densities of invasive species exceed levels indicated in the ecological site descriptions.

After Situation:

Invasive species have been treated to a level which results in improved plant condition, timber production, or wildlife habitat. The typical method of control is cutting or "frilling" around the entire diameter of an invasive tree such as tree-of-heaven with an axe and then spraying a herbicide such as imazapyr thoroughly wetting the frilled area.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $1,385.53

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $277.11

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #330 - Mechanical Control, Non-Invasive

Scenario Description:

Using equipment such as a masticator or forestry mulcher to control non-native invasive species that are competing with desirable species. This can be applied to wildlife habitat land and/or tree stands to remove undesirable species and open the land up for wildlife. The target with this work would be projects where an overgrown field, for example with Autumn Olive taking over. Specialist labor required to identify and mark target species to be treated. Resource concerns include poor wildlife habitat, undesirable plant communities, productivity and health of desirable plants, wildfire hazard and inadequate structure and composition of desirable species.

Before Situation:

A semi-open site intended for wildlife habitat or a stand of desirable trees is adversely affected by competition from undesirable non-native invasive species. The target vegetation to be controlled is too large to be mowed or shredded. Therefore, other m

After Situation:

The opened wildlife land and/or stand of trees intended for wildlife habitat management contains the composition and quality needed to meet the landowner's objectives and address the resource concerns. Complementary practices include 315 Herbaceous Weed Treatment, 327 Conservation Cover, 649 Structures for Wildlife, 643 Restoration of Rare or Declining Natural Communities, 644 Wetland Wildlife Habitat Management, 645 Upland Wildlife Habitat Management, and 647 Early Successional Habitat Development/Management;

Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $8,590.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $859.07

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #341 - Biological Control, High Density

Scenario Description:

Management of woody plant species through the use of livestock that are closely herded to concentrate grazing on targeted shrubs. Typical areas have dense stands of woody non-herbaceous species that exceed the desirable ecological site condition. Undesirable non- herbaceous vegetation may be present and impairing the desired ecological site condition. Targeted grazing herd is mobilized to site. Typical herd size 100-300 head. Goal is for maximum defoliation of brush.

Before Situation:

Area consist of dense stands of woody non-herbaceous species that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

After Situation:

Woody species are grazed to limit the regrowth of targeted shrubs and achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, affected hydrology and plant health and vigor is returning to near normal levels.

Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $14,880.60

Total Cost per Unit: $1,488.06

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #342 - Biological Control, Low Density

Scenario Description:

Management of woody plant species through the use of livestock that are closely herded to concentrate grazing on targeted shrubs. Typical areas have dense stands of woody non-herbaceous species that exceed the desirable ecological site condition. Undesirable non-herbaceous vegetation may be present and impairing the desired ecological site condition. Targeted grazing herd is mobilized to site. Typical herd size less than 100 head.

Before Situation:

Area consist of dense stands of woody non-herbaceous species that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

After Situation:

Woody species are grazed to limit the regrowth of targeted shrubs and achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, affected hydrology and plant health and vigor is returning to near normal levels. Implementation is consistent with the Brush Management 314 plan and specifications.

Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $7,440.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $744.03

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #359 - Mechanical and Chemical Control, Light Infestation

Scenario Description:

Light brush management is used where less than 10% canopy cover across the treatment area is in undesirable non-herbaceous cover, and the treatment area is less than 18% slope on average. Payment is based on impacted acres only. Treatment may consist of chemical, mechanical, manual, or a combination of methods to treat scattered individual plants.

Before Situation:

Planning area has less than 10% canopy cover of non-herbaceous undesirable species that must be controlled, such as but not limited to autumn olive, barberry, honeysuckle, multiflora rose, oriental bittersweet, privet, and tree of heaven. Typical resource

After Situation:

The land is no longer impacted by the undesirable non-herbaceous cover. Desirable vegetation is released from competition from undesirable non-herbaceous plants, which improves plant productivity and health, plant structure and composition, terrestrial habitat for wildlife and invertebrates, and feed and forage imbalance.

Feature Measure: Footprint of infestation

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,093.03

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $109.30

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #360 - Mechanical and Chemical Control, Medium Infestation

Scenario Description:

Medium brush management is used where 10% - 39% canopy cover across the treatment area is in undesirable non-herbaceous cover, and the treatment area is less than 18% slope on average. Payment is based on impacted acres only. Treatment may consist of chemical, mechanical, manual, or a combination of methods to treat scattered individual plants.

Before Situation:

Planning area has 10% - 39% canopy cover of non-herbaceous undesirable species that must be controlled, such as but not limited to autumn olive, barberry, honeysuckle, multiflora rose, oriental bittersweet, privet, and tree of heaven. Typical resource con

After Situation:

The land is no longer impacted by the undesirable non-herbaceous cover. Desirable vegetation is released from competition from undesirable non-herbaceous plants, which improves plant productivity and health, plant structure and composition, terrestrial habitat for wildlife and invertebrates, and feed and forage imbalance.

Feature Measure: Footprint of infestation

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,895.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $189.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #361 - Mechanical and Chemical Control, Heavy Infestation

Scenario Description:

Heavy brush management is used where 40% - 60% canopy cover across the treatment area is in undesirable non-herbaceous cover; or the treatment area is on land with 18% - 25% slope on average AND percent cover is less than or equal to 60% of undesirable plants. Payment is based on impacted acres only. Treatment may consist of chemical, mechanical, manual, or a combination of methods to treat scattered individual plants.

Before Situation:

Planning area has 40% - 60% canopy cover of non-herbaceous undesirable species that must be controlled, such as but not limited to autumn olive, barberry, honeysuckle, multiflora rose, oriental bittersweet, privet, and tree of heaven. Typical resource con

After Situation:

The land is no longer impacted by the undesirable non-herbaceous cover. Desirable vegetation is released from competition from undesirable non-herbaceous plants, which improves plant productivity and health, plant structure and composition, terrestrial habitat for wildlife and invertebrates, and feed and forage imbalance.

Feature Measure: Footprint of infestation

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,605.46

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $260.55

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #362 - Mechanical and Chemical Control, Very Heavy Infestation

Scenario Description:

Very heavy brush management is used where more than 60% canopy cover across the treatment area is in undesirable non-herbaceous cover, or the treatment area is on land with greater than 25% slope on average regardless of percent cover of undesirable plants. Payment is based on impacted acres only. Treatment may consist of chemical, mechanical, manual, or a combination of methods to treat scattered individual plants.

Before Situation:

Planning area has more than 60% canopy cover of non-herbaceous undesirable species that must be controlled, such as but not limited to autumn olive, barberry, honeysuckle, multiflora rose, oriental bittersweet, privet, and tree of heaven. Typical resource

After Situation:

The land is no longer impacted by the undesirable non-herbaceous cover. Desirable vegetation is released from competition from undesirable non-herbaceous plants, which improves plant productivity and health, plant structure and composition, terrestrial habitat for wildlife and invertebrates, and feed and forage imbalance.

Feature Measure: Footprint of infestation

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $8,750.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $875.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 314 - Brush Management

Scenario: #369 - Mechanical Control, Less Than or Equal to One Acre

Scenario Description:
Using hand tools and small power tools to remove or cut off invasive woody plants at or below the root collar. Typically this scenario is for woody and non-herbaceous species that are in early phases of invasion and are degrading herbaceous plant health and vigor for the 1 acre small farm.

Before Situation:
Small farm area is in various phases of woody non-herbaceous species encroachment that degrades the biotic integrity of the site resulting in poor herbaceous plant health and vigor. Continued degradation results in increased invasive woody species and poo

After Situation:
Woody species are removed to achieve desirable biotic conditions for herbaceous plant health and vigor. Hydrological site characteristics and plant health and vigor are improved, and plant pest pressure from invasive woody species is reduced.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $518.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $518.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 315 - Herbaceous Weed Treatment

Scenario: #1 - Hand Application

Scenario Description:

Using hand tools, such as axes, shovels, hoes, nippers, to remove or cut off herbaceous plants at or below the root collar. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have herbaceous weed species that are in the early phases of invasions. Typical unit is 10 acres.

Before Situation:

Area is in the very early phases of herbaceous weed encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion i

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition continues to progressing in an upward trend, hydrology and plant health and vigor are sustained.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $872.60

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $87.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 315 - Herbaceous Weed Treatment

Scenario: #2 - Chemical Control, Hand Application

Scenario Description:

Using hand tools, such as axes, shovels, hoes, nippers, to remove or cut off herbaceous plants at or below the root collar. Herbicide is applied to control re-growth of target weeds. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have herbaceous weed species that are in the early phases of invasions. Typical unit is 10 acres.

Before Situation:

Area is in the very early phases of herbaceous weed encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion i

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition continues to progressing in an upward trend, hydrology and plant health and vigor are sustained.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,717.96

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $171.80

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 315 - Herbaceous Weed Treatment

Scenario: #3 - Mechanical Control

Scenario Description:

Removal of herbaceous weeds of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of herbaceous weeds by the use of mower, brush hog, disc or other light equipment in order to reduce fuel loading and improve ecological site condition. Weed has exceeded desired levels based on ecological site potential. Typical unit is 40 acres.

Before Situation:

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $1,033.48

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $51.67

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 315 - Herbaceous Weed Treatment

Scenario: #4 - Mechanical and Chemical Control

Scenario Description:

Removal of herbaceous weeds of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of herbaceous weeds by the use of mower, brush hog, disc or other light equipment in order to reduce fuel loading and improve ecological site condition, then applying herbicide to control re-growth of target weeds. Weed has exceeded desired levels based on ecological site potential. Typical unit is 40 acres.

Before Situation:

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $2,246.97

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $112.35

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 315 - Herbaceous Weed Treatment

Scenario: #5 - Chemical Control, Spot Application

Scenario Description:

Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment, either initial or retreatment using hand-carried equipment (such as a backpack and hand-sprayer) to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition.

Before Situation:

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $908.20

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $45.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 315 - Herbaceous Weed Treatment

Scenario: #6 - Chemical Control, Ground Application

Scenario Description:

Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment using ground equipment to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition.

Before Situation:

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $1,190.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $59.54

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 315 - Herbaceous Weed Treatment

Scenario: #7 - Chemical Control, Aerial Application

Scenario Description:

Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment using airplane or helicopter to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition.

Before Situation:

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $1,938.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $96.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 315 - Herbaceous Weed Treatment

Scenario: #45 - Split Method

Scenario Description:

The practice entails the control of herbaceous vegetation by treating it up to three times during the multi-year treatment period in order to improve ecological site condition. The herbs can be treated with the same method or by a combination of methods. Vegetation needs to be treated at least twice in order to fully control it. Generally, herbicide volumes are reduced as the last treatment will kill resprouting stems or those which survived the first treatment or newly sprouted seedlings. Density has exceeded desired levels based on ecological site potential.

Before Situation:

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: acres planned

Scenario Unit: Acre

Scenario Typical Size: 25.0

Scenario Total Cost: $3,757.33

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $150.29

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 315 - Herbaceous Weed Treatment

Scenario: #46 - Chemical Control, Phragmites

Scenario Description:

Moderate control with chemicals for Phragmites and other dense weeds. Remove dense infestations of herbaceous weeds, such as phragmites, using state approved chemical methods. Often used on small areas of land where weed management is accomplished using intensive management techniques, such as chemical application (with hydraulic or backpack sprayers). This scenario is a well-established, dense stand of phragmites with significant thatch build-up, creating slow working conditions. An all-terrain vehicle, such as an Argo or Swampmaster is often used to create paths, carry the operator, and to power the hydraulic sprayer. Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Possible supporting practices include Brush Management (314), Drainage Water Management (554), Restoration and Management of Declining Habitats (643), Stream Habitat Improvement (395), Wetland Wildlife Habitat Management (644), Conservation Cover (327) or Critical Area Planting (342). Note: this scenario modeled after existing Massachusetts/New England regional scenario;

Before Situation:

Phragmites or other dense weeds have taken over a site. They are crowding out the native species and eliminating the habitat for the wildlife. Resource Concerns include Fish and Wildlife - Inadequate Habitat and Degraded Plant Condition.

After Situation:

Phragmites and other weeds have been controlled. The native species are returning and the wildlife habitat is restored.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,419.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,419.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 315 - Herbaceous Weed Treatment

Scenario: #82 - Mechanical Control, Less Than or Equal to One Acre

Scenario Description:
Using hand and small power tools to remove or cut off herbaceous invasive plants at or below the root collar. Typically this scenario is for herbaceous invasive species that are degrading the 1 acre small farm.

Before Situation:
Small farm area is in various phases of herbaceous species encroachment that degrades the biotic integrity resulting in poor plant health and vigor, and/or wildlife habitat. Continued degradation results in increased plant pest pressure, loss of plant div

After Situation:
Herbaceous species are removed to achieve desirable biotic conditions and improved plant health and vigor, and/or wildlife habitat. Hydrological site characteristics are improved, and plant pest pressure from invasive herbaceous species are reduced.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $354.93

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $354.93

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 315 - Herbaceous Weed Treatment

Scenario: #90 - Multi-Year Control, Invasive Annual Grasses

Scenario Description:

Grazing lands where multi-year control of invasive annual grasses is required. Cheatgrass, medusa head, ventenata, and other invasive annual grasses are present, threatening rangeland health and productivity, reducing livestock forage and wildlife habitat, and fueling more frequent and larger wildfires. Pre-emergent herbicide is applied to suppress invasive annual grass seedlings, deplete the invasive grass seedbank, and release desired rangeland vegetation. NRCS does not make chemical treatment recommendations. Use appropriate NRCS tools for risk assessment and refer to extension publications and product label instructions.

Before Situation:

Invasive annual grasses are present impacting the biotic integrity of rangeland health. Without control of the invasive annual grass seedbank, invasive plants continue to spread and outcompete native vegetation.

After Situation:

Appropriate structural/functional plant groups for the ecological site are released from invasive annual grass competition. Rangeland health biotic integrity indicator is improved.

Feature Measure: treated acres

Scenario Unit: Acre

Scenario Typical Size: 1,000.0

Scenario Total Cost: $98,562.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $98.56

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #1 - Incineration, Less Than 400 Pounds

Scenario Description:

This scenario consists of installing a manufactured Type IV incinerator designed to handle < 400 lbs. of average daily mortality for the species and size of the operation. System shall use high temperature (>1,300 degrees F) incineration with a secondary combustion or afterburner chamber prior to flue discharge. After determining average daily mortality in lbs., select smallest incinerator that meets capacity. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from i

After Situation:

A 200 cf incinerator with concrete pad and fuel tanks is installed such that animal mortality is being handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Included is a concrete slab to set the incinerator on and a fuel tank. Ash materials to be stored in suitable containers until land disposal as per the nutrient management plan or landfilled.

Feature Measure: Each Incinerator

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $15,783.42

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $15,783.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #2 - Incineration, 400 to 600 Pounds per Day

Scenario Description:

This scenario consists of installing a manufactured Type IV incinerator designed to handle 400 to 600 lbs. of average daily mortality for the species and size of the operation. Typically very large poultry or medium sized swine operations. System shall use high temperature (>1,300 degrees F) incineration with a secondary combustion or afterburner chamber prior to flue discharge. After determining average daily mortality in lbs., select smallest incinerator that meets capacity. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors are reduced, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from i

After Situation:

A 400 cf incinerator with concrete pad and fuel tanks is installed such that animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. In non-attainment areas, certain states may require a higher level of processing such as gasification or different methods. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Included is a concrete slab to set the incinerator on and a diesel fuel tank. Ash materials to be stored in suitable containers until land disposal as per the nutrient management plan or landfilled.

Feature Measure: Each Incinerator

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $17,181.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $17,181.67

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #3 - Incineration, Greater Than 600 Pounds

Scenario Description:

This scenario consists of installing a manufactured Type IV incinerator designed to handle greater than 600 pounds daily mortality. Typically a single dairy cow or multiple heifers or swine. System shall use high temperature (>1,300 degrees F) incineration with a secondary combustion or afterburner chamber prior to flue discharge. Select smallest incinerator that has a bin capacity to handle largest individual mortality. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from i

After Situation:

A 600 cf incinerator with concrete pad and fuel tanks is installed such that animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. In non-attainment areas, certain states may require a higher level of processing such as gasification or other approved method. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulations. Included is a concrete slab to set the incinerator on and a fuel tank. Ash materials to be stored in suitable containers, a waste storage pit until land disposal as per the nutrient management plan or landfilled. Proper incineration will require between 15 and 25 gallons of diesel fuel per usage.

Feature Measure: Each Incinerator

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $18,377.42

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $18,377.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #5 - Static Pile with Concrete Pad

Scenario Description:

This scenario consists of installing a concrete pad over permeable soils, karst topography, frequently accessed sites or sites with regulatory requirements. Typically associated with large dairy (1,000 cows plus heifers), beef, boar or sow animal mortality. Area sized to compost animal mortality as a static pile or windrow with equipment around materials. Sufficient carbon based bulking material added to allow natural aeration and a proper C:N ratio. Piles typically turned at least once to go into another heat cycle prior to final disposal, typically land application. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. Any roofed portion of the facility will be addressed with Roofs and Covers (367). Any approach areas will be addressed with Heavy Use Area Protection (561). Potential Associated Practices: Fence (382), Critical Area Planting (342), Heavy Use Area Protection (561), Nutrient Management (590), Access Road (560), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from i

After Situation:

Animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Typical system consists of a 60'x95' concrete surface to process an average mortality of 175 lb./day. Concrete 5" thick with light reinforcement. Typical layout is 18' wide piles with 8' wide access area is around each pile or windrow. Site preparation includes topsoil removal, minimal regrading and compaction, installing gravel or sand subbase and then concrete.

Feature Measure: Pad Area

Scenario Unit: Square Foot

Scenario Typical Size: 5,700.0

Scenario Total Cost: $50,791.16

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.91

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #9 - Rotary Drum, 270 to 523 Pounds of Daily Mortality

Scenario Description:

The system provides a composted material that is 100% contained during the composting process reducing the chance of pathogens and virus contact, especially since the poultry houses are in close proximity to others. Material will be composted and stored for a minimum of 30 days before land application. A small unit can process between 270 and 523 # of daily animal mortality plus equal volume of carbon material (i.e. wood chips). Scenario: 300 lbs. per day of poultry mortality (135,000-5# birds for 90 days @ 4% mortality) plus bulking agent (i.e. wood chips) requires a 300 mortality #/day small drum (22' long) system placed on a concrete pad. A secondary composting storage area (450 CF) is needed; 1 three side bin -(10L*10W*5H) Payment quantity based on each facility. This scenario shall not be used in conjunction with "Operation Type" scenarios (Nursery, Finisher, Sow, Poultry, and Turkey) that are developed for numerous types of technologies using the least cost alternative and use a Scenario Unit of Pounds Per Day. Associated Practices: Roofs and Covers (367), Waste Storage Facility (313), Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Diversion (362), Subsurface Drain (606),and Underground Outlet (620).

Before Situation:

Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from i

After Situation:

A rotary drum system and secondary composter bin is installed on a concrete pad that contains and composts the daily animal mortality and secretions, allows for continuous temperature management to assure even temperature distribution and protection from predators to minimize pathogen survival or spreading of viruses. An overall plan covers normal and catastrophic mortality events. The secondary composter volume is expected to be 40-60% of the original volume of material.. Final product material will be composted and stored for a minimum of 30 days before land application. Additional practices, if needed are Roofs and Covers (367), Heavy Use area Protection (561) , Diversion (362), Waste Storage Facilities (313) or Composter (317).

Feature Measure: Each Facility

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $57,109.32

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $57,109.32

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #10 - Rotary Drum, Greater Than 523 Pounds per Day

Scenario Description:

The system provides a composted material that is 100% contained during the composting process reducing the chance of pathogens and virus contact, especially since the poultry houses are in close proximity to others. A large unit can process more than 523 # of daily animal mortality or more plus equal volume of carbon material (i.e. wood chips). Final compost material will be composted and stored for a minimum of 30 days before land application. Scenario: 750 lbs. per day of poultry mortality (270,000-5# birds for 90 days @ 5% mortality) plus bulking agent (i.e. wood chips) requires a 750 mortality #/day drum system placed on a concrete pad. Install a mechanical, horizontal continuous flow, completely contained, large rotary drum to compost poultry mortality. It can process more than 750 # of daily animal mortality plus equal volume of carbon material (i.e. wood chips). A secondary composting storage area is not needed because an approved one meeting NRCS requirements is on site. Payment quantity based on each facility. This scenario shall not be used in conjunction with "Operation Type" scenarios (Nursery, Finisher, Sow, Poultry, and Turkey) that are developed for numerous types of technologies using the least cost alternative and use a Scenario Unit of Pounds Per Day. Associated Practices: Roofs and Covers (367), Waste Storage Facility (313), Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Diversion (362), Subsurface Drain (606),and Underground Outlet (620).

Before Situation:

Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from i

After Situation:

A rotary drum system is installed on a concrete pad that contains and composts the daily animal mortality and secretions, allows for continuous temperature management to assure even temperature distribution and protection from predators to minimize pathogen survival or spreading of viruses. An overall plan covers normal and catastrophic mortality events. The secondary composter volume is expected to be 40-60% of the original volume of material and a existing composter area meet's NRCS criteria and specifications. Final product material will be composted and stored for a minimum of 30 days before land application. Additional practices, if needed are Roofs and Covers (367), Heavy Use area Protection (561, Diversion (362), Waste Storage Facilities (313) or Composter (317).

Feature Measure: Each facility

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $72,900.04

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $72,900.04

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #12 - Static Bin

Scenario Description:

This scenario consists of installing a Static Bin Composter to compost mortality that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle and then the compost is stored for a period of time prior to final land application. This system is for static bin composting of poultry and other mortality when primary and secondary bin size is adjusted to accommodate for the operator's equipment width and access needs thus allowing each state to select the specific scenario which most closely represents their need. Size of facility is based on daily mortality and sizing procedures accepted in particular state. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. This scenario is developed for use by States that require a composter scenario with a Scenario Feature Measure of Floor Area and a Scenario Unit of Square Feet. This scenario shall not be used in conjunction with "Operation Type" scenarios (Nursery, Finisher, Sow, Poultry, and Turkey) that are developed for numerous types of technologies using the least cost alternative and use a Scenario Unit of Pounds Per Day. Potential Associated Practices: Roofs and Covers (367), Heavy Use Area Protection (561), Critical Area Planting (342), Livestock Pipeline (516), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from i

After Situation:

Animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wood wall static bin composting facility with the primary and secondary bins on one side and a separate storage area located adjacent to the bins. Material storage is required under the 316 standard by reference to the 317 Composting Facility standard (under facility sizing) therefore, the scenario includes the additional area required for tertiary treatment and raw material storage. A Broiler operation consists of a 44000 head operation, average bird weight of 4 pounds, 6 flocks per year, and a mortality rate of 5%. The average daily mortality loss (ADL) is 145 lb./day and a primary stage composting time of 14 days is based on 5 times the square root of the maximum weight . The primary stage bin volume is based on 0.2 times ADL times primary stage time. This requires a minimum primary bin volume of 409 ft3. Using a 10' x 8' x 5' bin with a volume of 400 cf, this operation requires 2 primary composting bins. The number of secondary bins equals the number of primary bins. This small operation requires a total of 4 (10' x 8' x 5') bins along with a storage area of 25' x 25' = 625 sf. Site preparation includes topsoil removal and grading, installing 6" of gravel, setting posts, installing concrete slab (6"), installing wooden walls and retaining planks.

Feature Measure: Nominal floor area of bins p

Scenario Unit: Square Foot

Scenario Typical Size: 945.0

Scenario Total Cost: $29,347.71

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $31.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #13 - Composter with Storage, Nursery

Scenario Description:

This scenario consists of installing a facility to compost animal mortality. The facility can consist of, but is not limited to, any of the following technologies: − Static Bin: Consisting of a group of small bins (concrete or wood walls) on a concrete pad to compost mortality in static pile(s) that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. − Invessel Rotary Drum. A commercially manufactured horizontal rotary drum to compost animal mortalities mixed with a carbon material (i.e. sawdust or wood chips). A secondary composting storage area is required to finish materials. − Invessel Grinding Batch. A commercially manufactured grinding batch composter with a minimum capacity of 1,000 lbs. per batch. A secondary composting storage area is required to finish materials. − Forced Air Composting Bins: Consisting of a group of small bins with an aeration and leachate collection system. − (This scenario does not address incinerators.) The least cost scenario is based on a static bin system with wood walls and an open storage area located adjacent to the bins. Size of facility is based on daily mortality and sizing procedures accepted in particular state. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Roofs and Covers (367), Heavy Use Area Protection (561), Critical Area Planting (342), Livestock Pipeline (516), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from i

After Situation:

Animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wood wall static bin composting facility with the primary, secondary, and tertiary bins on one side and a separate storage area located adjacent to the bins. Material storage is required under the 316 standard by reference to the 317 Composting Facility standard (under facility sizing) therefore, the scenario includes the additional area required for raw material storage. A Nursery operation consists of 5,000 head building capacity with 3.5 turns per year and an average weight of 25 pounds and a mortality rate of 5%. The average daily mortality loss (ADL) is 60 lb./day and a primary stage composting time of 30 days is based on 5 times the square root of the maximum weight of the nursery pig (35 pounds). The primary stage bin volume is based on 0.2 times ADL times primary stage time. This requires a minimum primary bin volume of 355 ft3. Using a 10' x 8' x 5' bin (with an effective height of 4.5' for additional bedding for leachate absorption) with a volume of 360 cf, this operation requires 1 primary composting bin. The number of secondary bins equals the number of primary bins. Tertiary bin volume is based on 30 day storage time, therefore, 1 - 400 cf bin is required. This small operation requires 3 (10' x 8' x 5') bins along with a storage area of 15' x 15' = 225 sf. Bins are sized to the nearest larger whole number of bins. Site preparation includes topsoil removal and grading, installing 4" of gravel, setting posts, installing concrete slab (4"), installing wooden walls and retaining planks.

Feature Measure: Pounds per Day Mortality

Scenario Unit: Pounds per Day

Scenario Typical Size: 60.0

Scenario Total Cost: $15,538.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $258.97

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #14 - Composter with Storage, Finisher

Scenario Description:

This scenario consists of installing a facility to compost animal mortality. The facility can consist of, but is not limited to, any of the following technologies: − Static Bin: Consisting of a group of small bins (concrete or wood walls) on a concrete pad to compost mortality in static pile(s) that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. − Invessel Rotary Drum. A commercially manufactured horizontal rotary drum to compost animal mortalities mixed with a carbon material (i.e. sawdust or wood chips). A secondary composting storage area is required to finish materials. − Invessel Grinding Batch. A commercially manufactured grinding batch composter with a minimum capacity of 1,000 lbs. per batch. A secondary composting storage area is required to finish materials. − Forced Air Composting Bins: Consisting of a group of small bins with an aeration and leachate collection system. − (This scenario does not address incinerators.) The least cost scenario is based on a static bin system with wood walls and an open storage area located adjacent to the bins. Size of facility is based on daily mortality and sizing procedures accepted in particular state. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Roofs and Covers (367), Heavy Use Area Protection (561), Critical Area Planting (342), Livestock Pipeline (516), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from i

After Situation:

Animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wood wall static bin composting facility with the primary, secondary, and tertiary bins on one side and a separate storage area located adjacent to the bins. Material storage is required under the 316 standard by reference to the 317 Composting Facility standard (under facility sizing) therefore, the scenario includes the additional area required for raw material storage. A Finisher operation consists of 1065 head building capacity with 2.7 turns per year and an average weight of 140 pounds and a mortality rate of 4%. The average daily mortality loss (ADL) is 44 lb./day and a primary stage composting time of 72 days is based on 5 times the square root of the maximum weight of the finisher (210 pounds). The primary stage bin volume is based on 0.2 times ADL times primary stage time. This requires a minimum primary bin volume of 639 ft3. Using a 10' x 8' x 5' bin (with an effective height of 4' for additional bedding for leachate absorption) with a volume of 320 cf, this operation requires 2 primary composting bins. The number of secondary bins equals the number of primary bins. Tertiary bin volume is based on 30 day storage time, therefore, 1 - 400 cf bin is required. This small operation requires 5 (10' x 8' x 5') bins along with a storage area of 25' x 25' = 625 sf. Bins are sized to the nearest larger whole number of bins. Site preparation includes topsoil removal and grading, installing 6" of gravel, setting posts, installing concrete slab (6"), installing wooden walls and retaining planks.

Feature Measure: Pounds per Day Mortality

Scenario Unit: Pounds per Day

Scenario Typical Size: 44.0

Scenario Total Cost: $32,517.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $739.03

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #15 - Composter with Storage, Sow

Scenario Description:

This scenario consists of installing a facility to compost animal mortality. The facility can consist of, but is not limited to, any of the following technologies: − Static Bin: Consisting of a group of small bins (concrete or wood walls) on a concrete pad to compost mortality in static pile(s) that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. − Invessel Rotary Drum. A commercially manufactured horizontal rotary drum to compost animal mortalities mixed with a carbon material (i.e. sawdust or wood chips). A secondary composting storage area is required to finish materials. − Invessel Grinding Batch. A commercially manufactured grinding batch composter with a minimum capacity of 1,000 lbs. per batch. A secondary composting storage area is required to finish materials. − Forced Air Composting Bins: Consisting of a group of small bins with an aeration and leachate collection system. − (This scenario does not address incinerators.) The least cost scenario is based on a static bin system with wood walls and an open storage area located adjacent to the bins. Size of facility is based on daily mortality and sizing procedures accepted in particular state. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Roofs and Covers (367), Heavy Use Area Protection (561), Critical Area Planting (342), Livestock Pipeline (516), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from i

After Situation:

Animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wood wall static bin composting facility with the primary, secondary, and tertiary bins on one side and a separate storage area located adjacent to the bins. Material storage is required under the 316 standard by reference to the 317 Composting Facility standard (under facility sizing) therefore, the scenario includes the additional area required for raw material storage. A Sow (farrow to wean) operation consists of 350 sows, average weight of 350 pounds and a sow mortality rate of 5% and each sow has 2.5 litters of 10 pigs each per year, average weight of 6 pounds, with a piglet mortality rate of 12%. The average daily mortality loss (ADL) of sows and piglets is 17 lb./day each for a total of 34 lb./day and a primary stage composting time of 94 days is based on 5 times the square root of the maximum weight of sow only (350 #). The primary stage bin volume is based on 0.2 times ADL times primary stage time. This requires a minimum primary bin volume of 637 ft3. Using a 10' x 8' x 5' bin (with an effective height of 4' for additional bedding for leachate absorption) with a volume of 320 cf, this operation requires 2 primary composting bins. The number of secondary bins equals the number of primary bins. Tertiary bin volume is based on 30 day storage time, therefore, 1 - 400 cf bin is required. This small operation requires 5 (10' x 8' x 5') bins along with a storage area of 25' x 25' = 625 sf. Bins are sized to the nearest larger whole number of bins. Site preparation includes topsoil removal and grading, installing 6" of gravel, setting posts, installing concrete slab (6"), installing wooden walls and retaining planks.

Feature Measure: Pounds per Day Mortality

Scenario Unit: Pounds per Day

Scenario Typical Size: 34.0

Scenario Total Cost: $32,517.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $956.40

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #16 - Composter with Storage, Poultry

Scenario Description:

This scenario consists of installing a facility to compost animal mortality. The facility can consist of, but is not limited to, any of the following technologies: − Static Bin: Consisting of a group of small bins (concrete or wood walls) on a concrete pad to compost mortality in static pile(s) that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. − Invessel Rotary Drum. A commercially manufactured horizontal rotary drum to compost animal mortalities mixed with a carbon material (i.e. sawdust or wood chips). A secondary composting storage area is required to finish materials. − Invessel Grinding Batch. A commercially manufactured grinding batch composter with a minimum capacity of 1,000 lbs. per batch. A secondary composting storage area is required to finish materials. − Forced Air Composting Bins: Consisting of a group of small bins with an aeration and leachate collection system. − (This scenario does not address incinerators.) The least cost scenario is based on a static bin system with wood walls and an open storage area located adjacent to the bins. Size of facility is based on daily mortality and sizing procedures accepted in particular state. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Roofs and Covers (367), Heavy Use Area Protection (561), Critical Area Planting (342), Livestock Pipeline (516), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from i

After Situation:

Animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wood wall static bin composting facility with the primary, secondary, and tertiary bins on one side and a separate storage area located adjacent to the bins. Material storage is required under the 316 standard by reference to the 317 Composting Facility standard (under facility sizing) therefore, the scenario includes the additional area required for raw material storage. A Broiler operation consists of a 43000 head operation, average bird weight of 4 pounds, 6 flocks per year, and a mortality rate of 5%. The average daily mortality loss (ADL) is 141 lb./day and a primary stage composting time of 14 days is based on 5 times the square root of the maximum weight . The primary stage bin volume is based on 0.2 times ADL times primary stage time. This requires a minimum primary bin volume of 400 ft3. Using a 10' x 8' x 5' bin with a volume of 400 cf, this operation requires 1 primary composting bin. The number of secondary bins equals the number of primary bins. Tertiary bin volume is based on 30 day storage time, therefore, 2 - 400 cf bin is required. This small operation requires a total of 4 (10' x 8' x 5') bins along with a storage area of 25' x 25' = 625 sf. Site preparation includes topsoil removal and grading, installing 4" of gravel, setting posts, installing concrete slab (6"), installing wooden walls and retaining planks.

Feature Measure: Pounds per Day Mortality

Scenario Unit: Pounds per Day

Scenario Typical Size: 141.0

Scenario Total Cost: $25,409.40

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $180.21

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #17 - Composter with Storage, Turkey

Scenario Description:

This scenario consists of installing a facility to compost animal mortality. The facility can consist of, but is not limited to, any of the following technologies: − Static Bin: Consisting of a group of small bins (concrete or wood walls) on a concrete pad to compost mortality in static pile(s) that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. − Invessel Rotary Drum. A commercially manufactured horizontal rotary drum to compost animal mortalities mixed with a carbon material (i.e. sawdust or wood chips). A secondary composting storage area is required to finish materials. − Invessel Grinding Batch. A commercially manufactured grinding batch composter with a minimum capacity of 1,000 lbs. per batch. A secondary composting storage area is required to finish materials. − Forced Air Composting Bins: Consisting of a group of small bins with an aeration and leachate collection system. − (This scenario does not address incinerators.) The least cost scenario is based on a static bin system with wood walls and an open storage area located adjacent to the bins. Size of facility is based on daily mortality and sizing procedures accepted in particular state. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Roofs and Covers (367), Heavy Use Area Protection (561), Critical Area Planting (342), Livestock Pipeline (516), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is handled in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from i

After Situation:

Animal mortality is handled in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wood wall static bin composting facility with the primary, secondary, and tertiary bins on one side and a separate storage area located adjacent to the bins. Material storage is required under the 316 standard by reference to the 317 Composting Facility standard (under facility sizing) therefore, the scenario includes the additional area required for raw material storage. A Tom Turkey operation consists of a 1480 head operation, maximum bird weight of 42 pounds, 112 day flock life, and a mortality rate of 12%. The average daily mortality loss (ADL) is 67 lb./day and a primary stage composting time of 32 days is based on 5 times the square root of the maximum weight. The primary stage bin volume is based on 0.2 times ADL times primary stage time. This requires a minimum primary bin volume of 432 ft3. Using a 10' x 8' x 5' bin with a volume of 400 cf, this operation requires 2 primary composting bins. The number of secondary bins equals the number of primary bins. Tertiary treatment will occur in the storage area. This small operation requires a total of 4 (10' x 8' x 5') bins along with a storage area of 25' x 25' = 625 sf. (Bins are sized to the nearest larger whole number of bins). Site preparation includes topsoil removal and grading, installing 4" of gravel, setting posts, installing concrete slab (6"), installing wooden walls and retaining planks.

Feature Measure: Pounds per Day Mortality

Scenario Unit: Pounds per Day

Scenario Typical Size: 67.0

Scenario Total Cost: $25,409.40

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $379.24

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #55 - Forced Air Composting with Preprocessing, Poultry and Turkey

Scenario Description:

This scenario consists of installing a manufactured Forced Air Composting with mortality preprocessing – poultry/turkey Unit designed to handle up to 1200 lbs. of average daily poultry/turkey mortality. The unit consist of a concrete slab with cut in forced aeration tubes, a mortality shredding/grinding machine, area for storage of 2nd stage compost and composting material, interior concrete wall to aid in handling the compost, and a roof over the entire system. The unit will be certified by a PE to meet state requirements. After determining average daily mortality in lbs., select the size unit needed from manufacturer supplied sizing table to determine square footage of facility needed. Payment made per unit square footage size obtained from manufacturers' product literature. This option is considered advanced mortality treatment and will require a smaller building footprint (75-50% less) than a roofed static compost pile with concrete floor and bins. Forced aeration compost facilities will also typically have reduced odor and process mortality in less time that static bin composting. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from inco

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation.

Feature Measure: Sq Feet of roof covered facil

Scenario Unit: Square Foot

Scenario Typical Size: 2,970.0

Scenario Total Cost: $209,975.40

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $70.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #66 - Forced Air Composting with Preprocessing, Sow and Finisher

Scenario Description:

This scenario consists of installing a manufactured Forced Air Composting with mortality preprocessing Unit for sow/hog finisher sized animal designed to handle up to 900 lbs. of average daily sow/finisher mortality. The unit consist of a concrete slab with cut in forced aeration tubes, a mortality shredding/grinding machine capable of handling larger animals, area for storage of 2nd stage compost and composting material, interior concrete wall to aid in handling the compost, and a roof over the entire system. The unit will be certified by a PE to meet state requirements. After determining average daily mortality in lbs., select the size unit needed from manufacturer supplied sizing table to determine square footage of facility needed. This typical design assumed 90 days of storage needed. Payment made per unit square footage size obtained from manufacturers' product literature. This option is considered advanced mortality treatment and will requires a smaller building footprint (75-50% less) than a roofed static compost pile with concrete floor and bins. Forced aeration compost facilities will also typically have reduced odor and process mortality in less time than static bin composting. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from inco

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation.

Feature Measure: Square Feet of roof covered

Scenario Unit: Square Foot

Scenario Typical Size: 3,510.0

Scenario Total Cost: $271,393.20

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $77.32

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #81 - Thermal Dehydration, Small Poultry

Scenario Description:

This scenario consists of installing a manufactured mortality thermal dehydration unit designed to handle up to 1,300 lbs. of average daily mortality for the species and size of the operation. System shall use simultaneous mixing and heating to 194 degrees Fahrenheit and will result in approximately 60% mortality volume reduction over a 12-hour cycle time. After determining average daily mortality in lbs., select the smallest unit that meets capacity. Payment made based on the size of the unit obtained from manufacturers' product literature. This option is not typically least-cost. In most states a roofed static compost pile with concrete floor and bins would be considered least cost. Therefore consider reducing payment rate as per State Conservationist discretion. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from inco

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Typical thermal dehydrator installed to handle up to 1300 lbs. per day average mortality for a poultry operation. Included is a 16'x16' concrete slab to set the thermal dehydrator on. Thermally dehydrated materials to be stored in suitable containers until land disposal as per the nutrient management plan or landfilled.

Feature Measure: Number of units

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $70,343.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $70,343.79

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 316 - Animal Mortality Facility

Scenario: #82 - Thermal Dehydration, Large Poultry

Scenario Description:

This scenario consists of installing a manufactured mortality thermal dehydration unit designed to handle 2,000 lbs. of average daily mortality for the species and size of the operation. System shall use simultaneous mixing and heating to 194 degrees Fahrenheit and will result in approximately 60% mortality volume reduction over a 12-hour cycle time. After determining average daily mortality in lbs., select the smallest unit that meets capacity. Payment made based on the size of the unit obtained from manufacturers' product literature. This option is not typically least-cost. In most states a roofed static compost pile with concrete floor and bins would be considered least cost. Therefore consider reducing payment rate as per State Conservationist discretion. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from inco

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Typical thermal dehydrator installed to handle 2,000 lbs. per day average mortality for a poultry operation. Included is a 20'x20' concrete slab to set the thermal dehydrator on. Thermally dehydrated materials to be stored in suitable containers until land disposal as per the nutrient management plan or landfilled.

Feature Measure: Number of units

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $87,160.85

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $87,160.85

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 317 - Composting Facility

Scenario: #1 - Wood or Concrete Walls and Floor, Less Than 500 Square Feet

Scenario Description:

A passive composting facility, with concrete under bins, is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for soil and crop quality. Scenario: A composter designed to compost manure from a small poultry operation resulting in composters (4-6'L*8'W*5'H bins) and a secondary treatment area (8'x32") for a total treatment area of 14'x32' or 448 SF. The bins have 4' wood walls placed on a 1.0'H * 6" thick reinforced curb. Material is picked up with a front end loader and transferred over the end wall to secondary area for further composting. The secondary bins are closed in on the ends with similar walls. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Animal Mortality Facility (316), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This sit

After Situation:

Structure installed and manure, litter and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Feature Measure: Total Bin Capacity

Scenario Unit: Square Foot

Scenario Typical Size: 448.0

Scenario Total Cost: $11,083.09

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $24.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 317 - Composting Facility

Scenario: #2 - Concrete Floor and Wood Bin Walls, Greater Than or Equal to 500 Square Feet

Scenario Description:

A passive composting facility, with concrete under bins, is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. Scenario: A composter is designed to compost litter from a 6-(50'*500') poultry houses. The composter is installed on a 40'x56' concrete pad with 5 primary (6' (L) x 8' (W) x 5' (H)) double wall composting bins and one long secondary/storage bin (40'(L) x 50'(W) x5') on the back side of the primary bins.. Typical bin wall consists 5' high treated lumber. Site preparation includes topsoil removal 0.5' plus shaping 0.5' for an average of 1.0), installing setting posts, installing 5" thick concrete slab on top of 4" gravel, and installing wooden walls. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Animal Mortality Facility (316), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This sit

After Situation:

Structure installed and manure, litter and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Feature Measure: Composter Footprint

Scenario Unit: Square Foot

Scenario Typical Size: 2,240.0

Scenario Total Cost: $29,059.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12.97

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 317 - Composting Facility

Scenario: #3 - Concrete Floor and Walls, Greater Than or Equal to 500 Square Feet

Scenario Description:

A passive organic composting facility, with concrete floor, is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. Scenario: The organic (cannot use pressure treated wood for storage) composter is designed to compost litter from a 6-(50'*500') poultry houses. The composter is installed on a 40'x56' concrete pad with 5 primary (6' (L) x 8' (W) x 5' (H)) concrete wall composting bins and one long secondary/storage bin (40'(L) x 50'(W) x5') on the back side of the primary bins.. Non-pressure treated, but painted and sealed wood gates are attached to the concrete wall on the composters to keep small animals out and for safety. Site preparation includes topsoil removal 0.5' plus shaping 0.5' for an average of 1.0), costs include installing 5" thick concrete slab on top of 4" gravel and concrete walls (8"*x5'H*6'L). All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Animal Mortality Facility (316), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This sit

After Situation:

Structure installed and manure, litter and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Feature Measure: Composter Footprint

Scenario Unit: Square Foot

Scenario Typical Size: 2,240.0

Scenario Total Cost: $41,766.96

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $18.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 317 - Composting Facility

Scenario: #6 - Windrow, Concrete Surface

Scenario Description:

The composting facility is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. This scenario is applicable when geological, soil, climate conditions or state and local regulations prohibit the use of an earthen surface, and requires a hard working surface such as concrete. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This sit

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. This scenario consists of installing a reinforced concrete pad over compacted gravel to act as a working area to compost organic material in a static pile, windrow, that has sufficient carbon based bulking material to allow natural aeration. Piles typically turned at least once to go into another heat cycle prior to final deposal, typically land application. Typical pad (60' x 100') on a reinforced concrete pad. Sub base consists of compacted gravel. Include sufficient area for processing equipment access. Single piles or windrows to minimize runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. Site preparation includes topsoil removal (0.5'), placement of compacted gravel (4"), and installing 5" of reinforced concrete.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 6,000.0

Scenario Total Cost: $51,018.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.50

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 317 - Composting Facility

Scenario: #28 - Farm Pad and Bins

Scenario Description:

The typical facility size is 6 feet by 9 feet and is comprised of a two-bin system, NOT TO EXCEED 75 sq-ft. The composting facility is installed on a small, urban or organic farm to address water quality concerns, pest/rodent concerns, and disease vectors resulting from improper vegetative waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. Screening is provided to limit access by vermin. Cost may be higher per unit than traditional compost facilities due to construction access limitations. Potential Associated Practices: Pond Sealing or Lining, Compacted Soil (520), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining, Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Diversion (362), Livestock Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635), Stormwater Runoff Control (570).

Before Situation:

Manure and other vegetative waste are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation p

After Situation:

Manure and other agricultural by-products are being controlled by collection at the source and properly stored at an environmentally suitable location, until such time that they are utilized in a proper manner, typically in accordance with a nutrient management plan. This is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. This scenario consists of installing a composting structure on a concrete pad. Concrete pad is 6'x9' on a compacted gravel surface. Include sufficient area for accessing compost structure. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. Site preparation includes topsoil removal, compaction of subsoil, and installing a geotextile plus compacted gravel, concrete pad, and composting structure.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 54.0

Scenario Total Cost: $3,993.87

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $73.96

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 317 - Composting Facility

Scenario: #57 - In-Vessel, Less Than 8 Cubic Yards

Scenario Description:

Installation of an in-vessel composter (rotary drum, forced air, or containerized with mechanical turning) to facilitate the decomposition of manure and/or other organic material into a final product sufficiently stable for storage, on farm use and application to land as a soil amendment. The raw inputs are primarily obtained for agricultural production or processing. The compost can be reused in the operation, utilized for crop production, soil improvement and/or marketed to the public. Typical size is for an in-vessel composter with a drum capacity of 4 CY with an approximate width of 4ft and length of 10 ft. The drum capacity is typically 85% of the nominal dimensions of the drum. This includes a concrete foundation for the composter of 6ft x 20ft to facilitate an area to collect finished compost. A secondary storage facility may require additional bin storage, which is not included. This scenario does not apply to routine disposal of livestock or poultry carcasses. Potential associated practices: Roofs and Covers (367), Waste Storage Facility (313), Fence (382), Critical Area Planting (342), Nutrient Management (590)

Before Situation:

Raw materials are stockpiled on-site and hauled to a landfill or directly to a field without treatment. Odors and vectors are routinely an issue following rain events.

After Situation:

An in-vessel composter with a drum capacity of 4 CY is installed to facilitate the composting of the organic materials as described. Potential for runoff, vectors, and odors are significantly reduced. The compost material is more stable and can be reused as described in the standard.

Feature Measure: Drum Capacity

Scenario Unit: Cubic Foot

Scenario Typical Size: 108.0

Scenario Total Cost: $24,652.45

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $228.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 317 - Composting Facility

Scenario: #67 - In-Vessel, 8 to 16 Cubic Yards

Scenario Description:

Installation of an in-vessel composter (rotary drum, forced air, or containerized with mechanical turning) to facilitate the decomposition of manure and/or other organic material into a final product sufficiently stable for storage, on farm use and application to land as a soil amendment. The raw inputs are primarily obtained for agricultural production or processing. The compost can be reused in the operation, utilized for crop production, soil improvement and/or marketed to the public.

Before Situation:

Raw materials are stockpiled on-site and hauled to a landfill or directly to a field without treatment. Odors and vectors are routinely an issue following rain events.

After Situation:

An in-vessel composter with a drum capacity of 8-16 CY is installed to facilitate the composting of the organic materials as described. Potential for runoff, vectors, and odors are significantly reduced. The compost material is more stable and can be reused as described in the standard. Typical sized to 12 CY.

Feature Measure: In-vessel Capacity

Scenario Unit: Cubic Foot

Scenario Typical Size: 324.0

Scenario Total Cost: $53,977.11

Total Cost per Unit: $166.60

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 318 - Short Term Storage of Animal Waste and By-Products

Scenario: #12 - Polyethylene Cover, Earthen Pad

Scenario Description:

A compacted earthen pad is constructed to store wastes on a short-term basis between collection and utilization as part of an agricultural waste management system. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Nutrient Management (590), Waste Recycling (633)

Before Situation:

Operator presently has a confined animal feeding operation and daily manure spreading operations are not possible due to weather. Manure and other agricultural waste by-products are not being managed in an environmentally safe manner. The wastes are eithe

After Situation:

Using a compacted earthen pad with a cover provides an environmentally safe measure for temporarily managing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Typical design: volume of material temporarily stored 12,576 ft3, pad area 6,000 ft2 (60' X 100'); 4' width around edge of manure stack to properly anchor and cover the manure; footprint of manure pile: 52' X 92", 6' manure stack height on 4:1 slopes; cover is a 6 mil poly film; 15" x 1/2" dia auger anchors on 2' centers.

Feature Measure: Volume of stored manure s

Scenario Unit: Cubic Foot

Scenario Typical Size: 12,576.0

Scenario Total Cost: $8,153.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 319 - On-Farm Secondary Containment Facility

Scenario: #1 - Wall, Concrete or Masonry

Scenario Description:

This practice scenario includes the installation of a reinforced concrete or masonry wall containment with a concrete slab around an existing storage tank. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Due to topography, limited site space and/or geological conditions a fabricated structure is needed. Structure will provide an environmentally safe facility for handling and storage of these products. Associated practices may include: Heavy Use Area Protection (561).

Before Situation:

Existing agricultural operation that has single walled fuel/oil storage tank(s) not protected. The producer has developed an SPCC plan in accordance with EPA requirements, that requires an above ground secondary containment facility for on-farm oil produc

After Situation:

This scenario is based on containment for a 10,000 gallon tank. The containment volume is designed for 125% of the tank volume (10000 gallons X 125% = 12500 gallons). Structure will provide an environmentally safe facility for handling and storage of these products. Typical containment dimensions are 668 sqft bottom x 6" thick slab with 8" thick x 4' tall formed sidewalls. Tanks will be moved or raised to install base materials. The fabricated containment structure will be installed in conformance with the design and specifications. The on-farm oil products stored on the farm have secondary containment of accidental release that controls the excessive release of organics, suspended sediments, and turbidity. Structure will provide an environmentally safe facility for handling and storage of these products.

Feature Measure: Surface Area of Floor

Scenario Unit: Square Foot

Scenario Typical Size: 668.0

Scenario Total Cost: $19,225.20

Total Cost per Unit: $28.78

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 319 - On-Farm Secondary Containment Facility

Scenario: #3 - Earthen Containment

Scenario Description:

This practice scenario includes the construction of an earthen containment wall with a flexible membrane liner around an existing storage tank. The containment will not have a roof. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Associated practices: Heavy Use Area Protection (561).

Before Situation:

The agricultural operation has a single walled fuel/oil storage tank(s) without any spill prevention protection. The producer has developed an SPCC plan in accordance with EPA requirements, which requires an above ground secondary containment facility for

After Situation:

This scenario is based on containment for a 10,000 gallon tank. The containment will be lined with a flexible membrane liner. The containment volume is designed for 125% of the tank volume (10,000 gallons X 125% = 12,500 gallons). The bottom dimensions of the containment are 40 ft x 24 ft. The wall is 2.5 feet high with a 2 ft top width and 2:1 sideslopes. The total volume of earthfill = 114 CY. The flexible liner size = 1,872 SF. Tanks will be moved or raised to install base materials. Hauled in earthfill will be used to construct the dike. The flexible liner will be installed in conformance with the design and specifications. The completed structure will provide an environmentally safe facility for handling and storage of oil products stored on the farm. Any accidental spills will be contained.

Feature Measure: Square Foot of Liner, botto

Scenario Unit: Square Foot

Scenario Typical Size: 960.0

Scenario Total Cost: $8,337.91

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 324 - Deep Tillage

Scenario: #1 - Depth, Less Than 20 Inches

Scenario Description:

Fields (80 acres) with adverse soils conditions that restrict plant growth such as compacted layers caused by tillage operations or restrictive layers such as hardpans (duripans) in the root zone. This practice does not apply to normal tillage practices to prepare a seedbed but is meant to fracture the restrictive soil layer.

Before Situation:

In this geographic area, crop plants are observed as having reduced yield, water is not infiltrating into the soil. Soil layers have been compacted by shallow tillage operations, or soils have a hardpan (duripan) layer that is restricting root growth. Typ

After Situation:

Soil compaction is measured with a penetrometer and visual observation of limiting root growth. Deep tillage operations such as subsoiling, paratilling or ripping are performed not as a part of the normal tillage operation for seedbed preparation, but used to relieve compaction at depths less than 20 inches. Soil moisture is less than 30 percent when deep tillage is used. The fractured zone will be sufficient to permit root penetration below the restrictive soil layer. Penetrometers are used to identify the severity (psi) of the compaction and the depth of the restrictive layer. Deep tillage is generally performed in the fall after crop harvest when soil conditions are dry. After deep tillage, harvest operations should be avoided when soil moisture is greater than 50% of field capacity. Field harvest haul traffic should be limited to end rows or haul roads. Using dual tires or tracks beneath tractors or grain wagons can help spread the weight load.

Feature Measure: <Unknown>

Scenario Unit: Acre

Scenario Typical Size: 80.0

Scenario Total Cost: $2,304.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $28.81

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 324 - Deep Tillage

Scenario: #2 - Depth, Greater Than 20 Inches

Scenario Description:

Fields (80 acres) with adverse soils conditions that restrict plant growth such as compacted layers caused by tillage operations or restrictive layers such as hardpans (duripans) in the root zone. This practice does not apply to normal tillage practices to prepare a seedbed but is meant to fracture the restrictive soil layer.

Before Situation:

In this geographic area, crop plants are observed as having reduced yield, water is not infiltrating into the soil. Soil layers have been compacted by shallow tillage operations, or soils have a hardpan (duripan) layer that is restricting root growth. Typ

After Situation:

Soil compaction is measured with a penetrometer and visual observation of limiting root growth. Deep tillage operations such as subsoiling, paratilling or ripping are performed not as a part of the normal tillage operation for seedbed preparation, but used to relieve compaction at depths more than 20 inches. Soil moisture is less than 30 percent when deep tillage is used. The fractured zone will be sufficient to permit root penetration below the restrictive soil layer. Penetrometers are used to identify the severity (psi) of the compaction and the depth of the restrictive layer. Deep tillage is generally performed in the fall after crop harvest when soil conditions are dry. When possible, harvest operations should be avoided when soil moisture is greater than 50% of field capacity. Field harvest haul traffic should be limited to end rows or haul roads. Using dual tires or tracks beneath tractors or grain wagons can help spread the weight load.

Feature Measure: <Unknown>

Scenario Unit: Acre

Scenario Typical Size: 80.0

Scenario Total Cost: $6,623.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $82.79

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 325 - High Tunnel System

Scenario: #21 - Quonset for Low Snow and Wind

Scenario Description:

Use in areas with low expected snow and wind loads. Quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

Feature Measure: Area of Tunnel Installed

Scenario Unit: Square Foot

Scenario Typical Size: 2,160.0

Scenario Total Cost: $10,934.84

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 325 - High Tunnel System

Scenario: #22 - Quonset for Low Wind or Snow, Intensive Sun

Scenario Description:

Use in areas with low expected snow and wind loads. Quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Because of extensive sun intensity, shade cloth is provided. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484)

Before Situation:

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor. High sun intensity shortens growing season, or decreases crop quality.

After Situation:

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Shade cloth protects crops from high intensity of sun, allowing crop production and quality to continue into summer months. Plant health and vigor is improved.

Feature Measure: Area of Tunnel Installed

Scenario Unit: Square Foot

Scenario Typical Size: 2,160.0

Scenario Total Cost: $12,154.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.63

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 325 - High Tunnel System

Scenario: #73 - Quonset for Low Snow and Wind, Small

Scenario Description:

Use in areas with low expected snow and wind loads on sites less than 1 acre. Quonset-style (round) manufactured frame of tubular steel (less than or equal to 20 ft x 30 ft.) covered with 4-year warrantee, 6 mil UV resistant plastic. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

Feature Measure: Area of High Tunnel Installe

Scenario Unit: Square Foot

Scenario Typical Size: 600.0

Scenario Total Cost: $5,541.31

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9.24

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 325 - High Tunnel System

Scenario: #74 - Gothic for Snow and Wind, Small

Scenario Description:

Use in areas with expected snow and wind loads on sites less than 1 acre. Gothic-style (arched) manufactured frame of tubular steel (less than or equal to 20 ft x 30 ft.) covered with 4-year warrantee, 6 mil UV resistant plastic. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

Feature Measure: Area of High Tunnel Installe

Scenario Unit: Square Foot

Scenario Typical Size: 600.0

Scenario Total Cost: $7,925.51

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13.21

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 325 - High Tunnel System

Scenario: #75 - Quonset for Intensive Sun, Small

Scenario Description:

Use in areas with low expected snow and wind loads on sites less than 1 acre. Quonset-style (round) manufactured frame of tubular steel (less than or equal to 20 ft x 30 ft.) covered with 4-year warrantee, 6 mil UV resistant plastic. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

Feature Measure: Area of High Tunnel Installe

Scenario Unit: Square Foot

Scenario Typical Size: 600.0

Scenario Total Cost: $5,741.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 325 - High Tunnel System

Scenario: #122 - Gothic for Snow and Wind, Intensive Sun

Scenario Description:

Used for contiguous US states in areas with high snowfall. A gothic style (peaked) manufactured frame of tubular steel (30 x 72 ft.) with end walls and/or truss supports covered with 4-year 6 mil plastic. Because of extensive sun intensity, shade cloth is provided. Costs are based on purchase of manufactured kit and landowner installing the structure. Structure must be installed to manufacturer's specifications.

Before Situation:

Cropland where extension of the growing season is needed. Additional resource concerns that may need to be addressed include soil erosion, soil condition, water quality, water quantity, and plant condition.

After Situation:

A high tunnel structure (30 x 72 ft.) has been installed and he growing season has been extended for 1-4 months on average. Shade cloth protects crops from high intensity of sun, allowing crop production and quality to continue into summer months. Plant health and vigor has been improved.

Feature Measure: Area of Tunnel Installed

Scenario Unit: Square Foot

Scenario Typical Size: 2,160.0

Scenario Total Cost: $16,727.91

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 325 - High Tunnel System

Scenario: #141 - Quonset with Gutters

Scenario Description:

Use in areas with low expected snow and wind loads. Quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Gutters and downspout on each side direct water away from high tunnel. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

Feature Measure: Area of Tunnel Installed

Scenario Unit: Square Foot

Scenario Typical Size: 2,160.0

Scenario Total Cost: $13,172.75

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.10

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 325 - High Tunnel System

Scenario: #142 - Quonset with Gutters, Small

Scenario Description:

Use in areas with low expected snow and wind loads. Quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Runoff is captured in gutters placed on tunnel sides and conveys water away from the high tunnel reducing erosion or to catch and reuse water. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved. Gutters convey water to reduce soil erosion, ponding near the high tunnel, and or catchment for water reuse.

Feature Measure: Area of High Tunnel Installe

Scenario Unit: Square Foot

Scenario Typical Size: 600.0

Scenario Total Cost: $6,519.36

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $10.87

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 325 - High Tunnel System

Scenario: #143 - Gothic with Gutters, Small

Scenario Description:

Use in areas with low expected snow and wind loads on sites less than 1 acre. Gothic-style (arched) manufactured frame of tubular steel (less than or equal to 20 ft x 30 ft.) covered with 4-year warrantee, 6 mil UV resistant plastic. Gutter placed on each side to capture and convey runoff away from the tunnel. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved. Gutter system reduces soil erosion and ponding and or conveys water to a catchment for reuse.

Feature Measure: Area of High Tunnel Installe

Scenario Unit: Square Foot

Scenario Typical Size: 600.0

Scenario Total Cost: $7,281.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12.14

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 325 - High Tunnel System

Scenario: #144 - Gothic with Gutters

Scenario Description:

Gothic-style manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Add on gutters and downspout system to convey water away from high tunnel to prevent flooding, soil erosion or to reuse water. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved. Gutters reduce soil erosion from runoff, reduce water flooding into tunnel.

Feature Measure: Area of tunnel installed

Scenario Unit: Square Foot

Scenario Typical Size: 2,160.0

Scenario Total Cost: $15,025.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.96

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 326 - Clearing and Snagging

Scenario: #2 - Medium, 200 to 400 Feet

Scenario Description:

Removal of vegetation, logs, or other material that impedes the proper functioning on 200 to 400 linear feet of a stream channel or water course to restore flow capacity; prevent bank erosion by eddies; reduce the formation of sediment bars; and/or minimize blockages by debris. Addresses resource concerns such as water quantity and soil erosion-streambanks.

Before Situation:

Vegetation, logs, or other material provide a flow restriction or divert flowing water against the streambank causing excess erosion. Approximately one-half of the channel flow capacity is obstructed. The flow blockage may encourage deposition in the main

After Situation:

Vegetation, logs, or other material have been removed to allow unrestricted flow in the channel and appurtenant structures. Material that poses no blockage threat is left in place to enhance aquatic habitat. Channel bed and banks are in equilibrium with the flow.

Feature Measure: Linear Feet

Scenario Unit: Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $5,911.76

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $19.71

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 326 - Clearing and Snagging

Scenario: #3 - Heavy, Greater Than 400 Feet

Scenario Description:

Removal of vegetation, logs, or other material that impedes the proper functioning on over 400 linear feet of a stream channel or water course to restore flow capacity; prevent bank erosion by eddies; reduce the formation of sediment bars; and/or minimize blockages by debris. Addresses resource concerns such as water quantity and soil erosion-streambanks.

Before Situation:

Vegetation, logs, or other material provide a flow restriction or divert flowing water against the streambank causing excess erosion. Approximately two-thirds of the channel flow capacity is obstructed. The flow blockage may encourage deposition in the ma

After Situation:

Vegetation, logs, or other material have been removed to allow unrestricted flow in the channel and appurtenant structures. Material that poses no blockage threat is left in place to enhance aquatic habitat. Channel bed and banks are in equilibrium with the flow.

Feature Measure: Linear Feet

Scenario Unit: Foot

Scenario Typical Size: 400.0

Scenario Total Cost: $8,074.26

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $20.19

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 326 - Clearing and Snagging

Scenario: #27 - Light, Less Than 200 Feet

Scenario Description:

Removal of vegetation, logs, or other material that impedes the proper functioning on up to 200 linear feet of a stream channel or water course to restore flow capacity; prevent bank erosion by eddies; reduce the formation of sediment bars; and/or minimize blockages by debris. Addresses resource concerns such as water quantity and soil erosion-streambanks.

Before Situation:

Vegetation, logs, or other material provide a flow restriction or divert flowing water against the streambank causing excess erosion. Approximately one-third of the channel flow capacity is obstructed. The flow blockage may encourage deposition in the mai

After Situation:

Vegetation, logs, or other material have been removed to allow unrestricted flow in the channel and appurtenant structures. Material that poses no blockage threat is left in place to enhance aquatic habitat. Channel bed and banks are in equilibrium with the flow.

Feature Measure: Linear Feet

Scenario Unit: Foot

Scenario Typical Size: 200.0

Scenario Total Cost: $5,299.80

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $26.50

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 327 - Conservation Cover

Scenario: #1 - Introduced Species

Scenario Description:

The land is covered with permanent non-native grass vegetation resulting in reduced soil erosion and water/sediment runoff, and the elimination of dust emissions which improves air quality significantly. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings. Applies to conventional or organic systems.

Before Situation:

Crops such as corn, soybeans, or cotton may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion e

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. The land is covered with permanent non-native grass vegetation resulting in reduced soil erosion and water/sediment runoff, and the elimination of significant dust emissions which improves air quality. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $11,585.16

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $231.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 327 - Conservation Cover

Scenario: #2 - Native Species

Scenario Description:

This practice applies on land to be retired from agricultural production and on other lands needing permanent protective cover. This practice typically involves conversion from a clean-tilled (conventional tilled) intensive cropping system to permanent native vegetation (scenario includes native grass). The typical size of the practice is 50 acres. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts. Applies to conventional or organic systems

Before Situation:

Crops such as corn, soybeans, or cotton may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion e

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. The land is covered with permanent native grass vegetation which reduces soil erosion and water/sediment runoff, and eliminates dust emissions which improves air quality. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $14,443.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $288.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 327 - Conservation Cover

Scenario: #3 - Alleyways, Orchard or Vineyard

Scenario Description:

This practice applies on orchards and vineyards needing permanent protective cover in the alleyways between tree and vine rows. The typical size of this practice is 20 acres. This practice typically involves conversion from a clean-tilled (conventional tilled) intensive cropping system to permanent vegetation (scenario includes non-native grass and legume mix). This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, enhance wildlife and/or pollinator habitat, manage plant pests, and reduce air quality impacts. Typically 60% of the surface area is conservation cover per acre.

Before Situation:

Orchard or vineyard with bare soil between vine/tree rows. Bare soil is exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter sediment/nutrient runoff from orchards/vineyards increases. Soil erosion exc

After Situation:

The 327 Implementation Requirements have been developed for the site and has been applied. Orchard or Vineyard area between vine/tree rows are planted with permanent introduced grass/legume mix. Area covered has reduced soil erosion, reduced water/sediment runoff, and improved air quality as a result of the elimination of significant amounts of dust emissions.. Plants sown for conservation cover may provide cover for beneficial insects, pollinators, and wildlife.

Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $3,210.09

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $160.50

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 327 - Conservation Cover

Scenario: #4 - Pollinator Species

Scenario Description:

Permanent vegetation, including a mix of native grasses, legumes, and forbs (mix may also include non-native species), established on any land needing permanent vegetative cover that provides habitat for pollinators. Typical practice size is variable depending on site; this scenario uses 1 ac as the typical size. In addition to providing pollinator habitat, this practice scenario may also reduce sheet, rill, and wind erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, odd areas, corners, etc. Applies to conventional or organic systems.

Before Situation:

Crops such as corn, soybeans, or cotton may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Erosion exceed

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. Land is covered with permanent pollinator habitat including a mix of native grasses, legumes, forbs (mix may also include non-native species). This practice may also have reduced soil erosion, reduced water/sediment runoff, and improved air quality as a result of the elimination of dust emissions. Plants sown for pollinator habitat may also provide cover for beneficial insects and wildlife. This scenario does not apply to critical area plantings.

Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $869.28

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $869.28

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 327 - Conservation Cover

Scenario: #22 - Monarch Species Mix

Scenario Description:

Establish permanent vegetative cover for pollinator habitat according to state specifications. Typically used for high quality nectar and pollen species. Assumes seed/plugs, equipment and labor for seed bed prep/planting, and weed management during establishment. Used for conventional or organic land on small, intensive areas that are central to specialty crop production. Not typically used for large-scale plantings. This is applicable to both organic and non-organic conditions.

Before Situation:

Old hayfields that are mowed typically in the fall lack milkweed needed for monarchs. Other crops such as corn, soybeans, or cotton are conventionally grown and harvested. The system provides little to no wildlife or pollinator habitat.

After Situation:

The 327 Implementation Requirements have been developed and applied for the site. Land covered with permanent monarch habitat including a mix of milkweed species, native grasses, legumes, and forbs. Plants sown for monarch habitat may also provide cover for beneficial insects and wildlife.

Feature Measure: area planted

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,100.11

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,100.11

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 327 - Conservation Cover

Scenario: #97 - Pollinator Mix-Small Footprint

Scenario Description:

Permanent vegetation, including a mix of grasses, legumes and forbs established on any land needing permanent vegetative cover that provides habitat, cover, and food for pollinators. Typical size varies depending on the site feasibility for length and width. Urban sites typical size is 2000 square feet (20x100 ft). This scenario included mechanical site preparation. This practice scenario may also reduce wind and water erosion, improve soil quality, reduce water quality degradation and reduce air emissions of particulate matter or greenhouse gases. Applies to conventional and organic systems. This scenario does not applied to areas needing Critical Area Planting.

Before Situation:

Crop rotation include specialty crops such as vegetable and fruit/berry production that benefit from pollinator activity. Urban agricultural sites do not provide for pollinator habitat at this time. Planting operations include mechanical removal of weeds.

After Situation:

The 327 implementation requirements have been developed for the site and applied. Land is in permanent vegetative cover reducing erosion and sediment delivery to water. Pollinator habitat has successfully established providing habitat and cover for pollinators and beneficial insects.

Feature Measure: Area of conservation Cover I

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 2.0

Scenario Total Cost: $342.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $171.00

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 328 - Conservation Crop Rotation

Scenario: #1 - Basic, Organic and Inorganic

Scenario Description:

In this region this practice may be part of a conservation management system on both organic and non-organic operations to: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to the producer for the time needed to plan and implement the logistics of changing the rotation to effectively implement a conservation crop rotation on a typical 200 acre cropland farm. No foregone income. Cost represents typical situations for conventional and organic producers.

Before Situation:

The rotation consists primarily of low residue producing row crops. Fields range from nearly flat to C and D slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

A rotation is established that provides additional high residue and/or perennial crops that may treat one or more of the following purposes: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, reduce water quality degradation due to excess nutrients, improve soil moisture efficiency, reduce the concentration of salts and other chemicals from saline seeps, reduce plant pest pressures, provide feed and forage for domestic livestock, or provide food and cover habitat for wildlife, including pollinator forage, and nesting.

Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,599.65

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $16.00

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 328 - Conservation Crop Rotation

Scenario: #5 - Specialty Crop, Organic and Inorganic

Scenario Description:

In this region a rotation of organic or non-organic specialty crops (fruits and vegetable) are produced as part of a conservation management system to treat one or more of the following resource concerns: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation on a typical 50 acre specialty crop farm. No foregone income. Cost represents typical situations for organic and non-organic producers.

Before Situation:

This rotation consisted of growing specialty crops. Fields range from nearly flat to B and C slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

The rotation established adds higher residue crop(s) to the rotation that will treat one or more of the following resource concerns on organic and non- organic farms: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting.

Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,132.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $42.66

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 328 - Conservation Crop Rotation

Scenario: #91 - Specialty Crop, Small

Scenario Description:

Scenario applies to Urban sites less than a 1/2 acre with a rotation of organic or non-organic specialty crops (fruits and vegetable) are produced as part of a conservation management system to treat one or more of the following resource concerns: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation on a typical urban specialty crop farm. Cost represents typical situations for organic and non-organic producers.

Before Situation:

This rotation consisted of growing specialty crops. Fields range from nearly flat to B and C slopes. Erosion, soil quality, and pest management are the primary concern. Removal of residue from the planted area is common leaving bare soil.

After Situation:

The rotation established adds diversity of plant material organic matter, higher residue amounts that will treat one or more of the following resource concerns on organic and non- organic farms: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, improve soil moisture efficiency or reduce plant pest pressure.

Feature Measure: area planned

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 15.0

Scenario Total Cost: $590.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $39.35

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 328 - Conservation Crop Rotation

Scenario: #102 - Add Crop, Transition to Organic

Scenario Description:

Current crop rotation is conventional nonorganic and crop rotation includes at least two different crop types. Producer is transitioning to organic. New crop types will be added to the conservation crop rotation to facilitate building soil organic matter, capturing nitrogen, breaking pest cycles, or other purposes that maintain or enhance the natural resources. Payment includes labor of the supervisor/decision maker and acquisition of knowledge for new crop types.

Before Situation:

Crops are grown nonorganically. Conventional operations and chemical use require mitigation measures to protect natural resources from risk. Chemicals may degrade soil health resource concerns. Crop rotation is not designed to be resource conserving.

After Situation:

Implementation requirements were delivered to the producer. Crop types were added to the crop rotation. Operations and management decisions for transition align with NOP requirements. Crop rotation has improved diversity improving soil resource concerns.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $4,277.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $106.93

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 329 - Residue and Tillage Management, No Till

Scenario: #1 - No-Till and Strip-Till

Scenario Description:

This practice typically involves conversion from a clean-tilled (conventional tilled) system to no-till or strip-till system on 100 acres of cropland. This involves managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting soil-disturbing activities used to establish and harvest crops. The practice is used to reduce sheet and rill erosion, reduce wind erosion, improve soil quality, reduce CO2 losses from the soil, reduce energy use, increase plant available moisture and provide food and escape cover for wildlife. The no-till/strip-till system includes non-tillage types of weed control and may also include a period of no till fallow. System is applicable in both irrigated and non-irrigated fields of organic and non-organic operations.

Before Situation:

Row crops or small grains are grown and harvested. Full width tillage is performed prior to planting and weed control during crop production is typically cultivation and chemical application. Fields are disked immediately following harvest, with additiona

After Situation:

The Implementation Requirements for 329 Residue Management, No Till is prepared and installed. Managing crop residue on the surface of a field (typical 100 acre) year around according to the 329 practice plan while limiting soil disturbing activities to those which place nutrients, and plant crops that meet the minimum criteria in the 329 practice standard. All crops are seeded/planted with a no-till drill or no-till/strip-till planter, which minimizes soil disturbance while establishing good seed-soil contact. All residues are to be maintained on the soil surface in a uniform distribution over the entire field and not burned or removed. Crop residues provide soil surface cover throughout the year. Runoff and erosion are reduced and no rills are visible on the soil surface. Wind erosion is reduced by standing residues and surface cover. Over time, soil health is improved due to the additional biomass (crop residues), ground cover, and soil infiltration. Crop residues and/or cover crop residues left on the soil surface may maximize weed control by increasing allelopathic and mulching effect, and provides cover for wildlife. The practice would require reducing soil disturbance and erosion and increasing biomass returned to the soil in sufficient amounts to achieve increased SCI and decreased STIR.

Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,389.54

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $23.90

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 329 - Residue and Tillage Management, No Till

Scenario: #3 - No-Till, Adaptive Management

Scenario Description:

The practice scenario is for the implementation of no till in small replicated plots to allow the producer to learn how to manage no till on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular no till management strategy (e.g., no till vs conventional till, drill vs planter, strip till vs no till, residue row cleaners, vs no row cleaners, etc.) This will be done by following the Agronomy Technical Note 10 - Adaptive Management.

Before Situation:

Row crops or small grains are grown and harvested. Full width tillage is performed prior to planting and weed control during crop production is typically cultivation and chemical application. Fields are disked immediately following harvest, with additiona

After Situation:

Implementation Requirements are prepared and an Adaptive Management Plan for the plots is developed and implemented. Installation of this scenario will result in establishment of no till replicated plots to compare to different management strategies for no till and other residue management strategies following the guidance in the Agronomy Technical Note 10 - Adaptive Management Process. Implementation involves establishing the replicated plots to evaluate one or more no till management strategies. The plot will consist of at least 4 replicated plots designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in no till management. Results are used to make no till management decisions to address erosion, soil health, and water quality issues. Yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. The yields for each plot will be adjusted to the appropriate moisture content. This would be repeated for 3 years.

Feature Measure: Based on 15 acre plots

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,795.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,795.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 329 - Residue and Tillage Management, No Till

Scenario: #28 - No-Till, Less Than Half Acre

Scenario Description:

Scenario applies to Urban sites less than a 1/2 acre with a rotation of organic or non-organic specialty crops (fruits and vegetable) are produced as part of a conservation management system to treat one or more of the following resource concerns: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Improve soil moisture efficiency, 4) Reduce plant pest pressures. This practice payment is provided to effectively implement no-till or strip-till management on a typical urban specialty crop farm. Cost represents typical situations for organic and non-organic producers.

Before Situation:

This rotation consisted of growing specialty crops. Fields range from nearly flat to B and C slopes. Erosion, soil quality, and pest management are the primary concern. Removal of residue from the planted area is common leaving bare soil-residue amounts a

After Situation:

The implementation requirements are written following CPS 329 Residue and Tillage Management to will treat one or more of the following resource concerns on organic and non- organic farms: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, improve soil moisture efficiency or reduce plant pest pressure. Soil disturbance is minimized with no-till drill or planter use. May include single slot opener and seedling or plugs follow. When pest management requires the removal of crop residue then planting beds are covered with cover crop using the 340 Cover Crop conservation practice. Runoff and erosion are reduced below T. No observed rills. Wind erosion reduced by maintaining surface cover. They system meets the soil condition index and STIR requirements.

Feature Measure: area planted

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 15.0

Scenario Total Cost: $664.58

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $44.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 329 - Residue and Tillage Management, No Till

Scenario: #42 - Planting Green

Scenario Description:

This scenario applies to cropland where residue and tillage management prepares the field for planting green techniques where cash crops are planted into living cover crop residues. This scenario involves the site preparation and management of live cover crop residues during no-till planting events. The practice is used to drastically reduce soil erosion, reduce CO2 losses from the field, maximize the four principles of soil health and related resource concerns, mitigate pesticide usage and amplify the benefits of supporting practices. The typical scenario size is 100 acres.

Before Situation:

Row crops or small grains are grown and harvested. Cover crop and/or crop residues that are present are too fragile or not in a quantity to adequately address soil, water, and air resource concerns. Cover crops planted the prior season were terminated bef

After Situation:

Live residues are maintained for extended periods of time in the spring, providing soil coverage that is adequate to control erosion and runoff and sedimentation. Soils are no-tilled and cover crop residues accumulate carbon providing carbon sequestration benefits as well as increasing soil microbial activity which further increase the function of the soil. Chemical inputs are generally reduced due to increased soil function and protection from live residues. Producers gain knowledge through workshops and working with crop consultants to maintain the success and long-term adoption of the practice. All cover crop residues are to be maintained on the surface until planting. The cover crop must be terminated before crop emergence. See complete NRCS Cover Crop Termination Guidelines for more information.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $7,953.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $79.54

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 330 - Contour Farming

Scenario: #1 - Contour Farming

Scenario Description:

This scenario meets the specifications of the NRCS Contour Farming Standard. This scenario applies to fields greater than 5 acres. Payment reflects the extra labor and initial supervision costs in laying out and implementing contour farming. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways

Before Situation:

The typical field size in this geographical region for this scenario is 30 acres. The field slope averages 6% while the slope length averages 160 feet. All farming operations on this cropland field including disking, bedding, planting, and cultivation are

After Situation:

Implementation Requirements are prepared and implemented according to 330 Contour Farming. This practice is installed on the entire field. A survey is completed by trained and certified Federal, State, local personnel or consultant to determine and "stake" contour row arrangement. Permanent row markers are established to ensure that this practice is maintained for the life of this practice. All field operations including disking, bedding, planting, and cultivation are performed on the contour which is near perpendicular to the field slope. The farm manager is initially on site to ensure that equipment operators are properly following contour methods. Soil erosion rates are reduced by nearly half and may be below tolerance depending on the rotation. Likewise, sedimentation has been significantly reduced.

Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $345.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11.53

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 331 - Contour Orchard and Other Perennial Crops

Scenario: #1 - Contour, Orchards and Vineyards

Scenario Description:

This scenario meets the specifications of the NRCS 331 Contour Orchards and Perennial Crops Standard. This scenario applies to fields greater than 5 acres. Payment reflects the extra labor and initial supervision costs in implementing and following contour operations compared to other methods. More time is usually needed when following contour operations due to more equipment time in shorter rows and more equipment turning. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

Before Situation:

The typical field size in this geographical region for this scenario is 10 acres. The field slope averages 6% while the slope length averages 160 feet. All farming operations are performed up and down the slope. Annual erosion rates for the rotation excee

After Situation:

Implementation Requirements are prepared and implemented according to the Contour Orchards and Perennial Crops Standard (331). This practice is installed on the entire field. All field operations including: harvesting, disking, bedding, and planting are performed on the contour which is near perpendicular to the field slope. The farm manager is initially on site to ensure that equipment operators are properly following contour methods. Soil erosion rates are reduced to tolerable soil loss levels. Likewise, sedimentation has be significantly reduced.

Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $345.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $34.58

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 332 - Contour Buffer Strips

Scenario: #27 - Native Species Organic or Inorganic, Foregone Income

Scenario Description:

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are organically or non-organically farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of native species. The area of the contour grass strip is taken out of production.

Before Situation:

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. A secondary concern is that there may not b

After Situation:

Native grasses, legumes and forbs will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

Feature Measure: number of acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $669.41

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $669.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 332 - Contour Buffer Strips

Scenario: #28 - Introduced Species Organic or Inorganic, Foregone Income

Scenario Description:

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of native species. The area of the contour grass strip is taken out of production. This applies to both organic and non-organic.

Before Situation:

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. A secondary concern is that there may not b

After Situation:

Introduced grasses and legumes will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $636.38

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $636.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 332 - Contour Buffer Strips

Scenario: #30 - Native Species for Specialty Crops, Foregone Income

Scenario Description:

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of native species. The area of the contour buffer strips is taken out of production.

Before Situation:

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. Specialty crops for market are produced on

After Situation:

Native grasses, legumes and forbs will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

Feature Measure: number of acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $2,319.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,319.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 332 - Contour Buffer Strips

Scenario: #31 - Introduced Species for Specialty Crops

Scenario Description:

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of mainly introduced species. The area of the field border is taken out of production.

Before Situation:

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. Specialty crops for market are grown in thi

After Situation:

Introduced grasses and legumes will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $2,285.99

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,285.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 333 - Amending Soil Properties with Gypsum Products

Scenario: #1 - Gypsum, Greater Than One Ton

Scenario Description:

Gypsum application of more than one ton/acre rate (typical average 1.5 tons/acre) to improve surface water quality due to phosphorus, pathogens, and soil health (Ca/Mg ratio). Scenario to be used in combination with an implemented nutrient management plan. The producer will use gypsum to improve soil surface structure and reduce concentration of dissolved reactive phosphorus (DRP) in runoff. Scenario includes the cost of material, application, and supervisor/management time to establish and manage new application methodology, including rates, timing, and sequence of application with other nutrient materials (i.e., manures, bio-solids, and fertilizers). The addressed resource concern is water quality and soil health. Associated practices are Nutrient Management (590), Conservation Crop Rotation (328), Cover Crop (340), Residue and Tillage Management, No-till (329) and Residue and Tillage Management, Reduced Till (345).

Before Situation:

Cropland in continuous production having relatively low soil organic matter and moderately high clay content with application of manure with a risk of pathogens. Soil in these fields has poor soil structure and a high risk of phosphorus and pathogen runof

After Situation:

A determination based on existing soil samples used in normal nutrient management has been made. The Implementation Requirements for Amending Soil Properties with Gypsum (333) has been developed for the site. The application of gypsum to the field based on the existing soil samples will result in reduced runoff and improved runoff water quality. This condition over time in combination with an implemented nutrient management plan and supporting practices to improve soil health will improve surface water quality.

Feature Measure: Acres with a gypsum produc

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $8,515.72

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $212.89

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 333 - Amending Soil Properties with Gypsum Products

Scenario: #2 - Gypsum, Less Than or Equal to One Ton

Scenario Description:

Gypsum application of less than or equal to one ton/acre rate (typical average 1 tons/acre) to improve surface water quality due to phosphorus, pathogens, and soil health (Ca/Mg ratio). Scenario to be used in combination with an implemented nutrient management plan. The producer will use gypsum to improve soil surface structure and reduce concentration of dissolved reactive phosphorus (DRP) in runoff. Scenario includes the cost of material, application, and management time to establish and manage new application methodology, including rates, timing, and sequence of application with other nutrient materials (i.e., manures, bio-solids, and fertilizers). . The addressed resource concern is water quality and soil health. Associated practices are Nutrient Management (590), Conservation Crop Rotation (328), Cover Crop (340), Residue and Tillage Management, No-till (329) and Residue and Tillage Management, Reduced Till (345).

Before Situation:

Cropland in continuous production having relatively low soil organic matter and moderately high clay content. Soil in these fields have poor soil structure and a high risk of phosphorus and pathogen runoff. The soils are susceptible to soil crusting and a

After Situation:

A determination based on existing soil samples used in normal nutrient management has been made. The Implementation Requirements for Amending Soil Properties with Gypsum (333) has been developed for the site. The application of gypsum to the field is based on the existing soil samples and will result in reduce runoff and improve runoff water quality. This condition over time in combination with the implemented nutrient management plan and supporting practices to improve soil health will improve surface water quality.

Feature Measure: Acres with a gypsum produc

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $4,460.84

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $111.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 334 - Controlled Traffic Farming

Scenario: #1 - Reduced Compaction Area

Scenario Description:

This practice must be part of a conservation management system to reduce soil compaction. This scenario considers the time needed to modify equipment, develop the technical skills necessary to effectively implement a controlled traffic farming system on a typical 200 acre cropland farm. The controlled traffic generally utilizes RTK automatic steering technology to locate and maintain high load field traffic. This scenario represents the costs associated with reducing the amount of surface area tracked/compacted to 33% or less. Cost represents typical situations for conventional, organic, and transitioning to organic producers.

Before Situation:

The typical scenario for this practice is a 200 acre row crop operation on high clay, poorly drained soils. Studies show that when high wheel load traffic is not controlled, up to 85% of the field is tracked causing some degree of soil compaction. Before

After Situation:

An Implementation Requirement for Controlled Traffic (334) is developed and the controlled traffic lanes installed per the implementation requirements. After the practice is installed wheel/track traffic is confined to designated traffic lanes/tramlines. Wheel/track soil compaction is confined to the traffic lanes to protect the remaining surface area and subsoil from wheel/track compaction. The wheel/track traffic follows the installed traffic lanes/tramlines each year.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 200.0

Scenario Total Cost: $11,896.42

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $59.48

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 334 - Controlled Traffic Farming

Scenario: #6 - Reduced Compaction Area, Annual

Scenario Description:

This practice must be part of a conservation management system to reduce soil compaction. This scenario considers the time needed to modify equipment, develop the technical skills necessary to effectively implement a controlled traffic farming system on a typical 200 acre cropland farm. The controlled traffic generally utilizes RTK automatic steering technology to locate and maintain high load field traffic. This scenario represents the costs associated with reducing the amount of surface area tracked/compacted to 33% or less. Cost represents typical situations for conventional, organic, and transitioning to organic producers. This scenario can only be used by those states that have an approved variance for modifying the lifespan of this practice to 1 year! Virginia has such a variance.

Before Situation:

The typical scenario for this practice is a 200 acre row crop operation on high clay, poorly drained soils. Studies show that when high wheel load traffic is not controlled, up to 85% of the field is tracked causing some degree of compaction. Before the p

After Situation:

An "Implementation Requirement" for Controlled Traffic (334) is developed and the controlled traffic lanes installed per the implementation requirements. After the practice is installed when/track traffic is confined to designated traffic lanes/tramlines. Wheel/track soil compaction is confined to the traffic lanes to protect the remaining surface area and subsoil from wheel/track compaction. The wheel/track traffic follows the installed traffic lanes/tramlines for the crop year.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 200.0

Scenario Total Cost: $3,981.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $19.91

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 336 - Soil Carbon Amendment

Scenario: #99 - Compost

Scenario Description:

This scenario uses compost from an offsite source to maintain, increase, or improve organic matter content and improve aggregate stability, habitat for soil organisms, and plant productivity and health. Compost has been tested according to the Test Methods for the Examination of Composting and Compost (TMECC), or by other Land Grant University (LGU) recognized methods. Compost is applied at the recommended rate to treat the identified resource concerns. Typical application rate is 3 ton compost/acre.

Before Situation:

An in-field assessment or a site specific resource assessment tool or test indicates that soil health resource concerns are present and the addition of analyzed and verified compost is needed to improve the condition of the soil.

After Situation:

Compost was tested and applied at the recommended rate that will improve soil organic matter and organism habitat without creating unacceptable risk of N or P loss. A follow up assessment is planned to determine the effect of the application.

Feature Measure: acres treated

Scenario Unit: Acre

Scenario Typical Size: 6.0

Scenario Total Cost: $1,700.77

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $283.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 336 - Soil Carbon Amendment

Scenario: #100 - Compost, Less Than 10,000 Square Feet

Scenario Description:

This scenario uses compost from an offsite source to maintain, increase, or improve organic matter content and improve aggregate stability, habitat for soil organisms, and plant productivity and health. This scenario is used for situations where manual labor is typically used to apply or incorporate compost amendments. Compost has been tested according to the Test Methods for the Examination of Composting and Compost (TMECC), or by other Land Grant University (LGU) recognized methods. Compost is applied at the recommended rate to treat the identified resource concerns.

Before Situation:

An in-field assessment or a site specific resource assessment tool or test indicates that soil health resource concerns are present and the addition of analyzed and verified compost is needed to improve the condition of the soil.

After Situation:

Compost was tested and applied at the recommended rate that will improve soil organic matter and organism habitat without creating unacceptable risk of N or P loss. A follow up assessment is planned to determine the effect of the compost application.

Feature Measure: Area treated.

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 10.0

Scenario Total Cost:	$589.24	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$58.92	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 336 - Soil Carbon Amendment

Scenario: #108 - Biochar

Scenario Description:

Apply 100% biochar (this assumes that it has been charged/inoculated) to sequester carbon, reduce N losses, and improve other soil health related resource concerns. Biochar has been tested according to the Test Methods for the Examination of Composting and Compost (TMECC), or by other Land Grant University (LGU) recognized methods and is imported from an outside source. Biochar is applied at the recommended rate to treat the identified resource concerns. Typical application is 4 cubic yards per acre.

Before Situation:

An in-field assessment or a site-specific resource assessment tool or test indicates that soil health resource concerns are present and the addition of analyzed and verified biochar is needed to improve the condition of the soil.

After Situation:

Biochar was applied at the recommended rate and proportion. Soil health resource concerns were treated. A follow up assessment is planned to determine the effect of the biochar application.

Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,726.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,726.29

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 336 - Soil Carbon Amendment

Scenario: #109 - Other Carbon Amendment

Scenario Description:

This scenario is used for the application of different types of other carbon amendments, such as woodchips, bagasse, high carbon wood ash or distillation residue that are obtained at a negligible cost. The primary purpose of this scenario is to facilitate transport and application of the other carbon amendment. The carbon amendment is tested and brought on site. Addition of the carbon amendment directly improves the carbon content of the soil and improves soil health related resource concerns.

Before Situation:

An in-field assessment or a site-specific resource assessment tool or test indicates that soil health resource concerns are present and the addition of analyzed and verified amendment is needed to improve the condition of the soil.

After Situation:

The carbon amendment was applied at the recommended rate based on the product analysis and the purpose for the application. Soil health resource concerns were treated. A follow up assessment is planned to determine the effect of the application.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 6.0

Scenario Total Cost: $981.41

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $163.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 336 - Soil Carbon Amendment

Scenario: #110 - Compost and Biochar, Less Than 10 Acres

Scenario Description:

Apply a blend of >=50% biochar and <=50% compost (by volume) to sequester carbon, reduce nitrogen loss, improve organic matter content and improve aggregate stability, habitat for soil organisms, and plant productivity and health. Biochar and compost has been tested according to the Test Methods for the Examination of Composting and Compost (TMECC), or by other Land Grant University (LGU) recognized methods and is imported from an outside source. Analysis from supplier.

Before Situation:

An in-field assessment or a site-specific resource assessment tool or test indicates that soil health resource concerns are present and the addition of analyzed and verified compost or manure and biochar is needed to improve the condition of the soil.

After Situation:

Compost and biochar were tested and applied at the recommended rate that will improve soil organic matter and organism habitat without creating unacceptable risk of N or P loss. A follow up assessment is planned to determine the effect of the application.

Feature Measure: Area treated

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 10.0

Scenario Total Cost: $700.93

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $70.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 336 - Soil Carbon Amendment

Scenario: #111 - Compost, Biochar

Scenario Description:

Apply a blend of >=40% biochar and <=60% compost (by volume) to sequester carbon, reduce nitrogen loss, and improve other soil health related resource concerns. Biochar and compost has been tested according to the Test Methods for the Examination of Composting and Compost (TMECC), or by other Land Grant University (LGU) recognized methods and is imported from an outside source. The blend contains at least 40% biochar and is applied at the recommended rate to treat the identified resource concerns. Typical application of blend at 4 cu yd per ace.

Before Situation:

An in-field assessment or a site-specific resource assessment tool or test indicates that soil health resource concerns are present and the addition of analyzed and verified biochar and compost or manure is needed to improve the condition of the soil.

After Situation:

Biochar and compost or manure were tested and applied at the recommended rate that will improve soil organic matter and organism habitat without creating unacceptable risk of N or P loss. A follow up assessment is planned to determine the effect of the application.

Feature Measure: Area

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $3,851.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $770.20

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 336 - Soil Carbon Amendment

Scenario: #113 - Biochar, Compost

Scenario Description:

Apply a blend of >=60% biochar and <=40% compost (by volume) to sequester carbon, reduce nitrogen loss, and improve other soil health related resource concerns. Biochar and compost has been tested according to the Test Methods for the Examination of Composting and Compost (TMECC), or by other Land Grant University (LGU) recognized methods and is imported from an outside source. Supplier provides product analysis. The blend contains at least 60% biochar and is applied at the recommended rate to treat the identified resource concerns.

Before Situation:

An in-field assessment or a site-specific resource assessment tool or test indicates that soil health resource concerns are present and the addition of analyzed and verified biochar and compost or manure is needed to improve the condition of the soil.

After Situation:

Biochar and compost or manure were tested and applied at the recommended rate that will improve soil organic matter and organism habitat without creating unacceptable risk of N or P loss. A follow up assessment is planned to determine the effect of the application.

Feature Measure: Area

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $4,331.93

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $866.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 336 - Soil Carbon Amendment

Scenario: #161 - Compost, Onsite

Scenario Description:

This scenario uses compost of known origin (feedstock) and production methods to maintain, increase, or improve organic matter content, aggregate stability, habitat for soil organisms, and soil C stock. Compost produced in a compost facility on- farm has been tested according to the Test Methods for the Examination of Composting and Compost (TMECC), or by other Land Grant University (LGU) recognized methods and contains the results of analyses of variables listed in Tables 1 and 3 of the practice standard. Components of total cost include procurement of amendment, amendment analysis, installation of amendment, and mobilization of amendment onsite. Typical application rate is 3-ton compost/acre.

Before Situation:

An in-field soil health assessment or a site-specific resource assessment tool or test indicates that soil health resource concerns are present and the addition of analyzed and verified compost as outlined in the practice standard (Tables 1 and 3) is need

After Situation:

Compost was tested and verified before application and applied at the recommended rate that will improve the resource concerns identified onsite as outlined in the practice standard without creating unacceptable risk of N or P loss. A follow-up assessment is planned to determine the effect of the application.

Feature Measure: acres treated

Scenario Unit: Acre

Scenario Typical Size: 6.0

Scenario Total Cost: $1,970.44

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $328.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 338 - Prescribed Burning

Scenario: #1 - Understory

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications. An Understory burn can consume debris or leaf litter under controlled conditions that otherwise could burn uncontrollably and devastatingly. Prior to burning unit may need to be treated to reduce slash height and quantities. Burn should be cool enough to not cause mortality to residual stand but also must reduce litter and debris. Burned firebreaks used to achieve total firebreak width are part of these burns. (Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios) Existing firebreaks are cleared of combustible debris or vegetation prior to ignition of fire using labor and hand tools. A bulldozer is brought on site and held in standby mode for suppression contingencies until the burn site is safe to leave unsupervised. Burn sites are monitored the next day for remaining hot spots and or spot over fire.

Before Situation:

Light slash accumulation in a open forest stand. Leaf litter and debris throughout stand. Small seedlings of various quantities may be present. Existing firebreaks are in various states of O&M and must be 'refreshed' prior to the prescribed burn. Hand rak

After Situation:

Litter, debris and slash are consumed, small seedlings may be killed during active burning. Residual larger trees have little to no scorching. Post treatment fire danger is significantly reduced.

Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,362.25

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $84.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 338 - Prescribed Burning

Scenario: #2 - Site Preparation

Scenario Description:

Treating areas to encourage natural seeding or to permit reforestation by planting or direct seeding. Burning is utilized to eliminate existing competition and debris, reduce forest fuel and to prepare the site for planting or seeding. Burning a cutover site helps prepare the site for replanting. Burn should expose a portions of bare soil for planting. Objectives of a site preparation burn may dictate timing and burn intensity. A bulldozer is brought on site and held in standby mode until the fire is safe to leave unsupervised. Burn sites are monitored the next day for remaining hot spots and or spot over fire.

Before Situation:

Area to be burned has had a portion of the over story removed. Slash, brush and grasses dominate the site. Random piles of slash exist near loading decks.

After Situation:

Area to be planted has been burned to remove slash left over from prior forest harvest activities. Site is clear enough to allow hand planting tree seedlings and some bare ground is exposed.

Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,348.80

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $83.72

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 338 - Prescribed Burning

Scenario: #3 - Native Grass

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications in order to control undesirable species, improve wildlife habitat, improve plant productivity and/or quality, facilitate grazing distribution and maintain ecological processes. This scenario is based on native warm season grass hayfield and terrain <15% slope. Cost to inspect firebreaks and cleared them of combustible material prior to ignition is included in cost of burn. However cost to install and establish the firebreaks is not included in the scenario cost. Refer to Firebreak (394) standard and cost scenarios.

Before Situation:

Desirable plant composition is lacking due to reduced plant vigor, invasive species or improper livestock distribution.

After Situation:

Desirable plant composition is restored, plant vigor improved and invasive species reduced. Forage production and quality for livestock and /or wildlife is improved.

Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $1,359.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $90.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 340 - Cover Crop

Scenario: #1 - Basic

Scenario Description:

Typically a small grain or legume (may also use forage sorghum, radishes, turnips, buckwheat, etc.) will be planted as a cover crop immediately after harvest of a row crop, and will be followed by a row crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using an approved herbicide prior to planting the subsequent crop.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare

After Situation:

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 30 days after harvest of the row crop, fields are planted with a small grain or legume cover crop (may also use forage sorghum, radishes, turnips, buckwheat, etc.), typically rye or clover. The average field size is 40 acres. The cover crop is seeded with a drill. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,384.61

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $84.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 340 - Cover Crop

Scenario: #6 - Adaptive Management

Scenario Description:

The practice scenario is for the implementation of cover crops in small replicated plots to allow the producer to learn how to manage cover crops on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular cover crop management strategy (e.g., cover crop vs no cover crop, multiple species vs, single species, evaluate different termination methods or timings, using a legume vs no legume for nitrogen credits). This will be done following the guidance in the NRCS Technical Note 10 - Adaptive Management.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare

After Situation:

Implementation Requirements for Cover Crop (340) will be prepared along with the Adaptive Management plan for the replicated cover crop plots and implemented. Installation of this scenario will result in establishment of a cover crop replicated plots to compare to different management strategies for cover crop management following the guidance in the Agronomy Technical Note 10 - Adaptive Management. Implementation involves establishing the replicated plots to evaluate one or more cover crop management strategies. The plot will consist of at least 4 replicated plots designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in cover crop management. Results are used to make cover crop management decisions to address erosion and water quality issues. Yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. The yields for each plot will be adjusted to the appropriate moisture content. This would be repeated for 3 years.

Feature Measure: Based on 10 acres

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,831.06

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,831.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 340 - Cover Crop

Scenario: #11 - Multi-Species

Scenario Description:

Typically the multi-species cover crop (two or more species) mix includes a small grain, a legume, and may include other species such as forage sorghum, radishes, turnips, buckwheat, etc.). This mix will address all the purposes of the Cover Crop (340) standard. Typically the cover crop is seeded immediately after harvest of a row crop, but may be inter-seeded into a row crop using a broadcast seeder, drill, or similar device. The cover crop will be followed by another row crop and will utilize the residue as a mulch. The cover crop should be allowed to generate as much biomass as possible without delaying planting of the following crop. The cover crop will be terminated using an approved herbicide or tillage prior to planting the subsequent crop and terminated per the NRCS Cover Crop Termination Guidelines.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less resulting in bare s

After Situation:

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 30 days after the harvest of row crop, fields are planted with a multi-species (2 or more species) cover crop mix that generally includes a small grain, a legume, and may include other species such as forage sorghum, radishes, turnips, buckwheat, etc. The average field size is 40 acres. The cover crop is seeded with a drill, broadcast seeder, aerial broadcast, or other method. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $4,174.61

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $104.37

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 340 - Cover Crop

Scenario: #28 - Basic, Organic

Scenario Description:

Typically a small grain or small grain-legume mix (may also use forage sorghum, radishes, turnips, buckwheat, etc.) will be planted as a cover crop immediately after harvest of an organically grown crop, and will be followed by an organically grown crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a no-till drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using a mechanical kill method (mowing, rolling, undercutting, etc.), within weeks prior to planting the subsequent crop. This scenario REQUIRES use of Certified Organic Seed. Associated practices: Conservation Cover (327), Conservation Crop Rotation (328), Residue and Tillage Management, No-Till/Strip Till/Direct Seed (329), Critical Area Planting (342), Residue Management, Seasonal (344), Residue and Tillage Management, Mulch Till (345), Residue and Tillage Management, Ridge Till (346), Nutrient Management (590), Integrated Pest Management (595).

Before Situation:

Organically grown crops such as various vegetable and fruit crops (along with organically produced row crops) are grown and harvested in mid-late fall. Fields are disked immediately following harvest. Residue amounts after harvest average 30% or less, res

After Situation:

Within 30 days after harvest of organic crop, fields are planted with a small grain-legume mix cover crop, typically rye and clover. The average field size is 25 acres. The cover crop is seeded with a no-till drill. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. The cover crop is terminated with using a mechanical kill method (mowing, rolling, undercutting, etc.), prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, and plant diversity introduced to the cropping system. Wind erosion is reduced by standing resides. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: Area Planted

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $3,862.42

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $128.75

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 340 - Cover Crop

Scenario: #48 - Cover Crop, Less Than or Equal to 1 Acre

Scenario Description:

Typically a small grain or legume will be planted as a cover crop immediately after harvest of a crop, and will be followed by a crop. This scenario assumes that seed will be planted by hand. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will typically be terminated by mowing or tilling prior to planting the subsequent crop.

Before Situation:

Crops such as sweet corn, vegetables, or root crops are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting

After Situation:

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 10 days after harvest of the crop, fields are planted with a small grain or legume cover crop, typically rye or clover. The average field size is 0.25 acres. The cover crop is seeded by hand. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: area planted

Scenario Unit: Acre

Scenario Typical Size: 0.3

Scenario Total Cost: $140.43

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $561.72

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 340 - Cover Crop

Scenario: #78 - Mechanical Termination, 1,000 Square Feet

Scenario Description:

Typical cover crop is more than one plant species, planted immediately after harvest of a crop and will be followed by a new crop. Cover crops are planted in the production bed typically 4000 square feet. Implementation is mostly hand labor or labor intensive. Cover crop is mechanically terminated in urban agricultural sites with State and local laws, ordinance and zoning restrictions on use of agrichemicals.

Before Situation:

Crop rotation include specialty crops such sweet corn, vegetables, or root crops are grown and harvested through out growing season and into mid-late fall. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind ero

After Situation:

Implementation Requirements according to Cover Crop (340) are prepared and implemented. The cover crop is seeded by hand. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover at the critical period when cover is needed usually late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is mechanically terminated as late as feasible to maximize cover crop biomass production and meet the planting date needs of the next crop. Over time, soil health is improved due to additions of biomass, improvement of aggregate stability and infiltration/aeration.

Feature Measure: Area of Cover Crop Installed

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 4.0

Scenario Total Cost: $127.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $31.84

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 340 - Cover Crop

Scenario: #79 - Multi-Species, 1,000 Square Feet

Scenario Description:

Typical cover crop is more than one plant species, planted immediately after harvest of a crop and will be followed by a new crop. Cover crops are planted in the production bed typically 4000 square feet. Implementation is mostly hand labor or labor intensive. Cover crop is mechanically terminated in urban agricultural sites with State and local laws, ordinance and zoning restrictions on use of agrichemicals.

Before Situation:

Crop rotation include specialty crops such sweet corn, vegetables, or root crops are grown and harvested through out growing season and into mid-late fall. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind ero

After Situation:

Implementation Requirements according to Cover Crop (340) are prepared and implemented. The cover crop is seeded by hand. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover at the critical period when cover is needed usually late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is mechanically terminated as late as feasible to maximize cover crop biomass production and meet the planting date needs of the next crop. Over time, soil health is improved due to additions of biomass, improvement of aggregate stability and infiltration/aeration.

Feature Measure: Area of Cover Crop Installed

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 4.0

Scenario Total Cost: $245.05

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $61.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 342 - Critical Area Planting

Scenario: #1 - Normal Tillage, Native or Introduced

Scenario Description:

Establishment of permanent vegetation (Native and Introduced) on a site (both organic and non-organic) that is void or nearly void of vegetation due to a natural occurrence or a newly constructed conservation practice. Costs include seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

Before Situation:

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from recent natural occurrences (fire, flood, wind, etc.) or due to newly constructed conservation practices such

After Situation:

Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard. This typical 1.0 acre critical area is stabilized by applying fertilizer, lime and seed. Soil amendments will be incorporated at a depth of four to six inches to improve fertility and ensure establishment of permanent vegetative cover. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

Feature Measure: area seeded

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $403.75

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $403.75

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 342 - Critical Area Planting

Scenario: #4 - Moderate Grading, Native or Introduced

Scenario Description:

Establishment of permanent vegetation (native and introduced) on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include a dozer for grading and shaping of small gullies, seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

Before Situation:

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc.) or human disturbance. The exposed areas have visible rills and small

After Situation:

Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard.. This typical 1.0 acre critical area is stabilized by grading and shaping the small gullies with a dozer and then applying fertilizer, lime and seed. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

Feature Measure: area seeded

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $930.88

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $930.88

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 342 - Critical Area Planting

Scenario: #6 - Heavy Grading, Native or Introduced

Scenario Description:

Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include a dozer for grading and shaping of moderate to severe gullies, seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

Before Situation:

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc.) or human disturbance. The exposed areas have visible rills and modera

After Situation:

Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard. This typical 1.0 acre critical area is stabilized by grading and shaping the moderate to severe gullies with a dozer and then applying fertilizer, lime and seed. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

Feature Measure: area seeded

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,334.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,334.17

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 342 - Critical Area Planting

Scenario: #64 - Permanent Cover

Scenario Description:

Establishment of permanent vegetation on a site that is void of vegetation or needs to improve the vegetation to adequately cover the existing site soil to reduce particulate matter dust emissions. Costs include seedbed prep with light tillage, seed, fertilizer and lime. Small Scale fields and urban sites have soil conditions limiting vegetation growth or sensitive areas that need protection.

Before Situation:

Fields are bare or sparsely vegetated exposed to wind and water erosion. Soil physical of chemical properties limit vegetative growth. Urban site soils contain heavy metal contaminants at risk of emissions as particulate dust from field activities.

After Situation:

The Implementation Requirement with site specific instruction is prepared for each treatment site. The establishment of permanent vegetation will stabilize the soil. Sensitive areas are protected. Particulate dust is reduced. Wind and water erosion loss is within tolerance levels (T).

Feature Measure: planted area

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 15.0

Scenario Total Cost: $344.74

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $22.98

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario: #2 - Reduced Tillage

Scenario Description:

Mulch-till is managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting the soil-disturbing activities used to grow crops in systems where the entire field surface is tilled by the planter/drill or tillage tools prior to planting. This practice includes tillage methods commonly referred to as mulch tillage, vertical tillage, chiseling and disking, or the use of high disturbance drills without additional tillage. It applies to stubble mulching on summer-fallowed land, to tillage for annually planted crops, to tillage for planted crops and to tillage for planting perennial crops. All residue shall be uniformly spread or managed over the surface throughout the critical erosion period(s). All residue shall be uniformly distributed over the entire field and not burned or removed. These periods of intensive tillage have led to excessive soil loss, often above the soil loss tolerance (T), due to the loss of crop residue on the soil surface. The NRCS erosion prediction model(s) will be used to review the farming operations and determine the amount of surface residue to manage throughout the rotation to keep soil loss below T. The producer will adopt a reduced till system to meet one or more of the practice purposes.

Before Situation:

Crops such as corn, soybeans, small grains, or cotton are grown and harvested. Fields are tilled immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil b

After Situation:

The Implementation Requirements are prepared following the criteria in the 345 Residue and Tillage Management, Reduced Till conservation practice standard. Reduced till applies to all cropland and other lands where crops are planted. This scenario includes the use of a reduce till systems and high disturbance drills, such as a hoe drill, air seeder, or no-till drill that disturbs a large percentage of soil surface during the planting operation. The residue that remains on the soil surface provides soil cover during late fall, throughout the winter, and into the early spring. Runoff and water/wind erosion are reduced and water quality improves. Over time, soil health is improved due to less tillage, the additional biomass, ground cover, soil infiltration, and plant diversity in the cropping system.

Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,499.70

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $25.00

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario: #3 - Adaptive Management

Scenario Description:

The practice scenario is for the implementation of mulch till in small replicated plots to allow the producer to learn how to manage mulch till on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular mulch till management strategy (e.g., mulch till vs. conventional till, two different mulch till systems, etc.). This will be done following the guidelines outlined in Agronomy Technical Note 10 - Adaptive Management.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare

After Situation:

Implementation Requirements and the Adaptive Management Plan is prepared for the plots and implemented. Installation of this scenario will result in establishment of mulch till replicated plots to compare to different management strategies for mulch till and other residue management strategies following the guidelines outlined in Agronomy Technical Note 10 - Adaptive Management and the Adaptive Management Guidance 345 for Mulch Till. Implementation involves establishing the replicated plots to evaluate one or more reduced till management strategies. The plot will consist of at least four replicated plots designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in reduced till management. Results are used to make reduced till management decisions to address erosion, soil health, and water quality issues. Yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. The yields for each plot will be adjusted to the appropriate moisture content and residue levels measured as needed. This practice will be repeated for three years.

Feature Measure: Based on 20 acres

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,694.69

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,694.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario: #65 - Reduced Tillage, Less Than 0.5 Acres

Scenario Description:

Scenario applies to Urban sites less than a 1/2 acre with a rotation of organic or non-organic specialty crops (fruits and vegetable) are produced as part of a conservation management system to treat one or more of the following resource concerns: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Improve soil moisture efficiency, 4) Reduce plant pest pressures. This practice payment effectively implements a reduced tillage system on a typical urban specialty crop farm. Cost represents typical situations for organic and non-organic producers.

Before Situation:

This rotation consisted of growing specialty crops. Fields range from nearly flat to B and C slopes. Erosion, soil quality, and pest management are the primary concern. Removal of residue from the planted area is common leaving bare soil-residue amounts a

After Situation:

The implementation requirements are written following CPS 345 Residue and Tillage Management, Reduced Tillage to treat one or more of the following resource concerns on organic and non- organic farms: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, improve soil moisture efficiency or reduce plant pest pressure. Soil disturbance is minimized with no-till drill or planter use. May include single slot opener and seedling or plug planting follows. When pest management requires the removal of crop residue then planting beds are covered with cover crop using the 340 Cover Crop conservation practice. Runoff and erosion are reduced below T. No observed rills. Wind erosion reduced by maintaining surface cover. Over time, soil health is improved due to less tillage, the additional biomass, ground cover, soil infiltration, and plant diversity in the cropping system.

Feature Measure: area planted

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 15.0

Scenario Total Cost: $580.49

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $38.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 350 - Sediment Basin

Scenario: #1 - Basin, Excavated

Scenario Description:

An excavated sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. The sediment basin is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment. Earthen spillway is constructed as needed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

Before Situation:

Disturbed areas on all land uses that have excessive erosion lead to deterioration of receiving waters due to excessive sedimentation.

After Situation:

'The typical sediment basin is constructed by excavating 1500 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Feature Measure: Excavated volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,500.0

Scenario Total Cost: $4,060.66

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.71

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 350 - Sediment Basin

Scenario: #2 - Earthen Basin, No Pipe

Scenario Description:

An low hazard class embankment earthen sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. An earthen embankment will be constructed with an earthen auxiliary spillway, as designed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

Before Situation:

Disturbed areas on all land uses that have excessive erosion lead to deterioration of receiving waters due to excessive sedimentation.

After Situation:

The typical sediment basin is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 1500 cubic yards to create an embankment. The embankment will be designed and constructed according the pond standard (378). The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378). No principal spillway will be used. Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Feature Measure: Embankment volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,500.0

Scenario Total Cost: $4,060.66

Total Cost per Unit: $2.71

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 350 - Sediment Basin

Scenario: #3 - Earthen Basin, Pipe

Scenario Description:

An low hazard class embankment earthen sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. An earthen embankment will be constructed with a principal spillway conduit and earthen auxiliary spillway, as designed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

Before Situation:

Disturbed areas on all land uses that have excessive erosion lead to deterioration of receiving waters due to excessive sedimentation.

After Situation:

The typical sediment basin is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 1500 cubic yards to create an embankment. The embankment will be designed and constructed according the Pond standard (378). The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 25 feet or less. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The principal spillway is created using an approved conduit material and filter diaphragm. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378).
Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Feature Measure: Embankment volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,500.0

Scenario Total Cost: $11,508.71

Total Cost per Unit: $7.67

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 350 - Sediment Basin

Scenario: #19 - Volume, Excavated

Scenario Description:

An excavated sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. The sediment basin is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment. Earthen spillway is constructed as needed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

Before Situation:

Disturbed areas on all land uses that have excessive erosion lead to deterioration of receiving waters due to excessive sedimentation.

After Situation:

'The typical sediment basin is constructed by excavating 1500 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Feature Measure: Excavated volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,500.0

Scenario Total Cost: $4,094.41

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.73

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 351 - Well Decommissioning

Scenario: #1 - Shallow Well, Less Than or Equal to 20 Feet

Scenario Description:

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

Before Situation:

Shallow well or hand dug well that is less than 20 feet deep. Assume 30" diameter casing. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Triba

After Situation:

Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Associated practices: 342 Critical Area Seeding

Feature Measure: Length of well casing

Scenario Unit: Foot

Scenario Typical Size: 15.0

Scenario Total Cost: $3,283.58

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $218.91

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 351 - Well Decommissioning

Scenario: #2 - Shallow Well, Greater Than 20 Feet

Scenario Description:
A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water.

Before Situation:
Shallow or hand dug well that is greater than 30 feet deep. Assume 30" diameter casing.

After Situation:
Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Associated practices: 342 Critical Area Seeding

Feature Measure: Length of well casing

Scenario Unit: Foot

Scenario Typical Size: 30.0

Scenario Total Cost: $5,825.96

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $194.20

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 351 - Well Decommissioning

Scenario: #3 - Drilled Well

Scenario Description:
A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water.

Before Situation:
Drilled well, any depth, typical is 400'. Assume 6" diameter casing.

After Situation:
Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Associated practices: 342 Critical Area Seeding

Feature Measure: Each well decommissioned

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $5,550.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,550.81

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 355 - Groundwater Testing

Scenario: #1 - Basic

Scenario Description:

Typical scenario includes the professional testing for nitrates, nitrites, and coliform to confirm well water meets basic water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is suspected to be acceptable.

Before Situation:

There are no known contaminants of the well, however, neighboring wells have known issues with nitrates, or coliform, and confirmation of acceptable water quality is desired. Manure is spread near to the well, following a nutrient management plan; well co

After Situation:

Water quality results are known.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $71.21

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $71.21

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 355 - Groundwater Testing

Scenario: #2 - Specialty

Scenario Description:

Typical scenario includes the professional testing for pesticides, heavy metals, VOC's or other less common substances, in addition to the basic water test items. Tests are intended to confirm well water meets water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is suspected to be degraded due to a specialized substance.

Before Situation:

There are no known contaminants of the well, however, neighboring wells have known issues with water quality, and confirmation of acceptable water quality is desired. Manure, pesticides, or other potential contaminants have been spread near to the well, i

After Situation:

Water quality results are known.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $349.89

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $349.89

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 355 - Groundwater Testing

Scenario: #3 - Full Spectrum

Scenario Description:

Typical scenario includes the professional comprehensive testing for all less common substances, to include: pesticides, heavy metals, VOC's or other less common substances, in addition to the basic water test items. Tests are intended to confirm well water meets water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is known to be degraded due to a specialized substance but thorough analysis is warranted.

Before Situation:

There are no known contaminants of the well, however, neighboring wells have known issues with water quality, and confirmation of acceptable water quality is desired. Manure, pesticides, sewage sludge, or other potential contaminants have been spread near

After Situation:

Water quality results are known.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $375.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $375.27

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 356 - Dike and Levee

Scenario: #1 - Material Haul, Less Than or Equal to One Mile

Scenario Description:

Construction of a barrier, constructed of an earthen embankment, to control water level. Embankment structure to provide adequate freeboard, allowance for settlement, and foundation and embankment stability. Material haul < 1 mile. Associated practices include, but are not limited to: PS327 Conservation Cover, PS656 Constructed Wetland, PS342 Critical Area Planting, PS378 Ponds, PS382 Fence, PS464 Irrigation Land Levelling, PS500 Obstruction Removal, PS528 Prescribed Grazing, PS587 Structure for Water Control, PS620 Underground Outlet, PS645 Upland Wildlife Management, PS658 Wetland Creation, PS659 Wetland Enhancement, PS657 Wetland Restoration, PS644 Wetland Wildlife Habitat Management.

Before Situation:

Site is subject to flooding or inundation which poses a potential hazard to public safety, damage to land or property. Site may also require control of water level for purposes connected with crop production; fish and wildlife management; or wetland maint

After Situation:

Water level controlled by a stable earthen structure. Potential hazard to public safety, land or property mitigated; environmental benefit provided.

Feature Measure: Volume of Earthfill (includi

Scenario Unit: Cubic Yard

Scenario Typical Size: 4,500.0

Scenario Total Cost: $33,681.45

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7.48

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 356 - Dike and Levee

Scenario: #2 - Material Haul, Greater Than One Mile

Scenario Description:

Construction of a barrier, constructed of an earthen embankment, to control water level. Embankment structure to provide adequate freeboard, allowance for settlement, and foundation and embankment stability. Material haul > 1 mile. Associated practices include, but are not limited to: PS327 Conservation Cover, PS656 Constructed Wetland, PS342 Critical Area Planting, PS378 Ponds, PS382 Fence, PS464 Irrigation Land Levelling, PS500 Obstruction Removal, PS528 Prescribed Grazing, PS587 Structure for Water Control, PS620 Underground Outlet, PS645 Upland Wildlife Management, PS658 Wetland Creation, PS659 Wetland Enhancement, PS657 Wetland Restoration, PS644 Wetland Wildlife Habitat Management.

Before Situation:

Site is subject to flooding or inundation which poses a potential hazard to public safety, damage to land or property. Site may also require control of water level for purposes connected with crop production; fish and wildlife management; or wetland maint

After Situation:

Water level controlled by a stable earthen structure. Potential hazard to public safety, land or property mitigated; environmental benefit provided.

Feature Measure: Volume of Earthfill (includin

Scenario Unit: Cubic Yard

Scenario Typical Size: 4,500.0

Scenario Total Cost: $37,443.90

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.32

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 359 - Waste Treatment Lagoon

Scenario: #1 - Waste Treatment Lagoon

Scenario Description:

A waste treatment lagoon is a component of a waste management system that provides biological treatment of manure and other byproducts of animal agricultural operations by reducing the pollution potential. Resource concern addressed is water quality by reducing the pollution potential to surface and groundwater by treating and storing liquid waste. Earthen lagoon liners are addressed with another standard. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), and Solid/Liquid Waste Separation Facility (632).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled

After Situation:

A waste treatment lagoon constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing and treating waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : Design Volume 439,440 ft3; 260' X 208' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 13'; 1' freeboard (not included in design volume)

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Foot

Scenario Typical Size: 439,440.0

Scenario Total Cost: $102,047.50

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 360 - Waste Facility Closure

Scenario: #1 - Soil Remediation

Scenario Description:

This practice scenario includes the remediation of the soil in an abandoned poultry structures previously used to store poultry waste (litter) on an earthen floor. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342).

Before Situation:

The abandoned poultry house has a damaged roof exposing the earthen floor of the structure to rainfall. Rainfall and nutrients on the floor of the house pose a risk to surface water from contaminated runoff or to ground water from seepage into the underly

After Situation:

This scenario is based on a 40' wide x 400' long poultry house with 1 foot depth of nutrient laden soil to remediate (16,000 CF). Payment under this scenario includes only activities associated with the soil remediation. Soil remediation activities in this scenario include removing the nutrient enriched soil found in the first 7 inches of soil beneath the litter floor and mixing wood chips with the remaining 5 inches of soil. Nutrient level testing and field application of the removed soil shall be performed according to nutrient planning in conformance with Nutrient Management, Code 590. The remaining 5 inches of soil will be remediated in-situ by mixing in wood chips, at a rate of 33% of the volume of remaining soil, for the purpose of nitrogen sequestration. Additional soil will be hauled in (estimated at 110% of the soil volume that was removed for field application) to backfill the depression. Shaping and crowning of the soil material on the disturbed area and critical area seeding will be done to provide drainage, complete the site remediation and establish vegetation. Operation and maintenance of the site will include nutrient testing the following year to determine if the nutrients in the mixed soil have been remediated and surface and ground water resource concerns have been addressed. In this scenario, samples at four (4) locations will be taken at 6, 12, 18 and 24 inches at the end of Year 1.

Feature Measure: Cubic feet of soil remediate

Scenario Unit: Cubic Foot

Scenario Typical Size: 16,000.0

Scenario Total Cost: $19,657.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 360 - Waste Facility Closure

Scenario: #2 - Decommission, Feedlot

Scenario Description:

This practice scenario includes the remediation of the soil on an abandoned feedlot previously used to feed animals on a bare earthen lot. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342).

Before Situation:

The feedlot is abandoned. Vegetation has not been reestablished. The high level of nutrients in the soil is preventing volunteer establishment of native vegetation. Rainfall and nutrients on the bare earth feedlot pose a risk to surface water from contami

After Situation:

This scenario is based on a 3 acre feedlot. Surveys and testing have determined the manure pack averages 8 inches in depth and the level of nutrients in the 4 inches of soil below the manure pack is too high to treat insitu with vegetation. Payment under this scenario includes only activities associated with the soil remediation. Soil remediation activities in this scenario include removing the nutrient enriched manure pack and soil, an average of 12 inches below the existing surface (130,680 CF). The excavated surface will be vegetated with a mix of salt tolerant plants in conformance with Critical Area Planting, Code 342. Nutrient level testing and field application of the removed soil shall be performed according to nutrient planning in conformance with Nutrient Management, Code 590. Shaping and crowning of the soil material on the disturbed area and critical area seeding will be done to provide drainage, complete the site remediation and establish vegetation. Operation and maintenance of the site will include nutrient testing the following year to determine if the soil has been remediated and surface and ground water resource concerns have been addressed. In this scenario, samples at four (4) locations will be taken at 6, 12, 18 and 24 inches at the end of Year 1. Fence and feed bunk removal is to be performed under Obstruction Removal, Code 500.

Feature Measure: Cubic feet of soil remediate

Scenario Unit: Cubic Foot

Scenario Typical Size: 130,680.0

Scenario Total Cost: $47,306.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.36

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 360 - Waste Facility Closure

Scenario: #3 - Decommission, Concrete Storage

Scenario Description:

This practice scenario includes the demolition of a concrete waste storage structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing concrete waste storage structure is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts

After Situation:

This scenario assumes a concrete waste storage structure, with top dimensions of 60 ft x 60 ft with 10 ft vertical walls. The walls are 8 inches thick, the concrete floor is 5 inches thick and the footing for the wall is 12 inches wide by 24 inches deep. The total structural storage volume equals 36,000 cubic feet. The total volume of concrete to be demolished is 3,580 cubic feet ([2 X (60 ft + 60 ft) X 8in /12 in/ft] + [60 ft X 60 ft X 5in /12 in/ft] + [2 X (60 ft + 60 ft) X 12in /12 in/ft X 24in /12in/ft]). The volume of waste to be removed approximately equals 50% of the structural volume (50% X 36,000 = 18,000 CF). The volume of earthwork (earthfill and/or excavation, final grading) required is approximately 50% of the structural volume. The concrete will be demolished and hauled off-site for recycling or disposal. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Demolition of a concrete waste storage structure includes agitating, removing, and spreading the waste remaining in the structure. All waste material shall be land applied in accordance with Nutrient Management (590). Excavated areas will be filled in. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Demolition of the concrete waste structure will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Feature Measure: Cubic Feet of concrete to be

Scenario Unit: Cubic Foot

Scenario Typical Size: 3,580.0

Scenario Total Cost: $13,299.95

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.72

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 360 - Waste Facility Closure

Scenario: #4 - Decommission, 5 Percent Solids

Scenario Description:

This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 95% liquid/slurry waste and 5% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to wa

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 95% if the structural volume (95% X 63,851 CF = 60,658 CF). The volume of solid waste to be removed approximately equals 5% of the structural volume (5% X 63,851 = 3,193 CF). The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the structural volume. The volume of earthwork will include 60% as excavation and 40% as compacted earthfill. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached and the excavation filled in with the embankment material or hauled in earthfill. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Feature Measure: Cubic feet of structural stor

Scenario Unit: Cubic Foot

Scenario Typical Size: 63,851.0

Scenario Total Cost: $18,791.14

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.29

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 360 - Waste Facility Closure

Scenario: #6 - Decommission, 50 Percent Solids

Scenario Description:

This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 50% liquid/slurry waste and 50% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to wa

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 50% if the structural volume (50% X 63,851 CF = 31,925 CF). The volume of solid waste to be removed approximately equals 50% of the structural volume (50% X 63,851 = 31,925 CF). The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the structural volume. The volume of earthwork will include 60% as excavation and 40% as compacted earthfill. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached and the excavation filled in with the embankment material or hauled in earthfill. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Feature Measure: Cubic feet of structural stor

Scenario Unit: Cubic Foot

Scenario Typical Size: 63,851.0

Scenario Total Cost: $23,237.28

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.36

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 360 - Waste Facility Closure

Scenario: #10 - Convert to Freshwater, 50 Percent Solids

Scenario Description:

This practice scenario includes the conversion of an earthen liquid waste impoundment (embankment or excavated type) to fresh water storage where the estimated volume of waste to be removed is approximately 50% liquid/slurry waste and 50% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to wa

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 50% of the structural volume (50% X 63,851 CF = 31,925 CF). The volume of solid waste to be removed approximately equals 50% of the structural volume (50% X 63,851 = 31,925 CF). The volume of earthwork (earthfill and/or excavation) required to meet current NRCS standards and perform final grading and shaping of the site is approximately 5% of the structural volume. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Conversion of a liquid waste storage impoundment for fresh water storage includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be brought up to current NRCS standards for its intended purpose. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Conversion to fresh water storage will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment.

Feature Measure: Cubic feet of structural stor

Scenario Unit: Cubic Foot

Scenario Typical Size: 63,851.0

Scenario Total Cost: $19,201.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.30

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 360 - Waste Facility Closure

Scenario: #40 - Decommission, Long-Haul

Scenario Description:

This scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the waste needs to be hauled greater than 5 miles to CNMP identified fields that are suitable for land application disposal. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. The surrounding area, once agricultural lands, are quickly being developed due to local/regional economic growth. Nearby fields trad

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The CNMP clearly identified fields that are suitable for land application disposal but they are 5 miles away and public roads must be traveled to haul the waste to these fields. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 50% if the structural volume (31,925 CF). The lagoon will be pumped, therefore the total volume for hauling and then injected land application is 31,925 CF or 238,803 Gal. The remaining 50% solids will be hauled and spread of fields (31,925 CF or 1182 CYD). The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the structural volume. The volume of earthwork will include 60% as excavation and 40% as compacted earthfill. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes pumping , removing, and injecting liquid/slurry and solids waste material, and removing solid/sludge waste remaining in the bottom and spreading that on land. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached, and the excavation filled in with the embankment material or hauled in earthfill. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Feature Measure: Cubic feet of structural stor

Scenario Unit: Cubic Foot

Scenario Typical Size: 63,851.0

Scenario Total Cost: $29,752.34

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.47

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 362 - Diversion

Scenario: #1 - Diversion

Scenario Description:

An earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet. or other suitable outlet. Typical diversion is, 1000 feet long installed on a field slope of 5 percent and requires 1 CY excavation per LF. Channel my be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contribu

After Situation:

Diversion is 1000 feet long installed using a dozer. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606).

Feature Measure: Length of Diversion

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $3,417.92

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 362 - Diversion

Scenario: #2 - Curb, Concrete

Scenario Description:

A reinforced concrete (RC) curb constructed across the slope to divert runoff away from farmsteads, gullies, critical erosion areas, construction areas, agricultural waste system, other sensitive areas, or to a waste storage facility. Outlet may be a waterway, underground outlet, or other suitable outlet. Typical 1.0 ft. high, 6 inch thick RC curb diversion is approximately 50 feet long with a 2.0 ft wide footing and requires approximately 0.056 CY of RC per linear ft. The curb will be placed on 6" of compacted sand. Concrete diversion is necessary due to limited footprint availability.

Before Situation:

Excessive roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated. Also, contaminated lot runoff that needs to be diverted to a waste storage

After Situation:

The 1.0 ft. high, 6 inch thick RC curb diversion is approximately 50 feet long. "Clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Polluted water is diverted to a waste storage facility for proper storage. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Waste Storage Facility (313).

Feature Measure: Length of concrete diversio

Scenario Unit: Foot

Scenario Typical Size: 50.0

Scenario Total Cost: $2,078.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $41.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 367 - Roofs and Covers

Scenario: #1 - Post Frame Roof, Less Than 30 Feet

Scenario Description:

A timber framed building with a timber or steel "sheet" roof and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess pr

After Situation:

A timber framed building with a timber or steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 1,000 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Feature Measure: Footprint of building

Scenario Unit: Square Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $18,200.54

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $18.20

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 367 - Roofs and Covers

Scenario: #2 - Post Frame Roof, 30 to 60 Feet

Scenario Description:

A timber framed building with a timber or steel "sheet" roof and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess pr

After Situation:

A timber framed building with a timber or steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 4,000 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Feature Measure: Footprint of building

Scenario Unit: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $55,790.54

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13.95

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 367 - Roofs and Covers

Scenario: #3 - Post Frame Roof, Bedrock

Scenario Description:

A timber framed building with a timber or steel "sheet" roof and supporting foundation that consists of bedrock. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess pr

After Situation:

A timber framed building with a timber or steel "sheet" roof and supporting foundation that is installed on bedrock. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 4,000 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Feature Measure: Footprint of building

Scenario Unit: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $64,457.71

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $16.11

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 367 - Roofs and Covers

Scenario: #5 - Steel Frame, Roof

Scenario Description:

A steel framed building with steel "sheet" roof and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices includes Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess pr

After Situation:

A steel framed building with steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 10,000 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Feature Measure: Footprint of building

Scenario Unit: Square Foot

Scenario Typical Size: 10,000.0

Scenario Total Cost: $201,343.71

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $20.13

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 367 - Roofs and Covers

Scenario: #7 - Flexible Roof

Scenario Description:

A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess pr

After Situation:

A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Roof or cover will be engineered and installed in accordance with appropriate building codes and permits. Typical size is 1,000 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Feature Measure: Footprint of the building

Scenario Unit: Square Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $15,081.50

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $15.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 367 - Roofs and Covers

Scenario: #16 - Post Frame Roof, 30 to 60 Feet for Hazardous Conditions

Scenario Description:

A timber framed building with a timber or steel "sheet" roof and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess pr

After Situation:

A timber framed building with a timber or steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 3,840 square feet (40'x96') and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Feature Measure: Footprint of building

Scenario Unit: Square Foot

Scenario Typical Size: 3,840.0

Scenario Total Cost: $78,616.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $20.47

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 367 - Roofs and Covers

Scenario: #24 - Roof, Timber or Steel Sheet

Scenario Description:

A timber framed building with a timber or steel "sheet" roof and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess pr

After Situation:

A timber framed building with a timber or steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 1,000 square feet and is over an approved storage or treatment facility. It is designed to prevent precipitation from allowing proper management of animal waste (solid or liquid manure or compost) or chemical contamination of surface and ground water; Thus mitigating the negative factors of added precipitation from the "before practice situation.

Feature Measure: Footprint of building

Scenario Unit: Square Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $18,200.54

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $18.20

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 368 - Emergency Animal Mortality Management

Scenario: #3 - Burial

Scenario Description:

This scenario consists of the on-site burial of animal mortalities resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 25 head of mature cattle located near the area where the cattle have been found. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 3' additional cover over carcasses. Construct a 6' x 60' (surface dimensions) burial site with appropriate cover. Site can handle mortality for 25 mature beef cattle. On site soils can be re-compacted to meet required imperviousness. Include 3' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of 1000 lbs. Animal

Scenario Unit: Animal Unit

Scenario Typical Size: 25.0

Scenario Total Cost: $3,874.20

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $154.97

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 368 - Emergency Animal Mortality Management

Scenario: #4 - Composting, In-House

Scenario Description:

This scenario consists the emergency disposal of poultry mortality by composting in a static windrow. The cause of mortality is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from inco

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. The typical scenario number of birds to be disposed of is 20,000, 4 pound birds which can be composted in-house. Composting requires 1.5 pounds of carbon per pound of bird. There is 0.5 pounds of litter per bird already on site. Wood chips (45 pcf) will be used as the additional carbon source. The composting windrow construction operation consists of 2 pieces of equipment and 2 add'l laborers: 1) stockpiling birds and litter in center of house; 2) construct 2 windrow bases using carbon material; 3) place carcass/litter mix on bases; 4) cover with carbon material; 5) cap windrows with any remaining litter; 6) after first heat cycle remove windrow from house and reconstruct outside house for finishing. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of 1000 lbs. Animal

Scenario Unit: Animal Unit

Scenario Typical Size: 80.0

Scenario Total Cost: $9,381.63

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $117.27

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 368 - Emergency Animal Mortality Management

Scenario: #80 - Burial, Cattle or Horses

Scenario Description:

This scenario consists of the on-site burial of cattle or horse mortalities resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 5 head averaging 1000 pounds each located near the area where the cattle have been found. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 2' additional cover over carcasses. Construct a 16'W x 32'L (surface dimensions) burial site with appropriate cover. On site soils can be recompacted to meet required imperviousness. Include 2' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of head

Scenario Unit: Each

Scenario Typical Size: 5.0

Scenario Total Cost: $3,271.46

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $654.29

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 368 - Emergency Animal Mortality Management

Scenario: #81 - Burial, Swine

Scenario Description:

This scenario consists of the on-site burial of swine or other similarly sized animal mortalities on a small size operation resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the burial of 1 boar at 450 pounds, 9 sows at 350 pounds each and 8 babies/sow at 12 pounds each in a landfill. The number of head counted are the sows and boar (adult swine) at 10 total head. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 2' additional cover over carcasses. Construct a 16'W x 52'L (surface dimensions) burial site with appropriate cover. On site soils can be recompacted to meet required imperviousness. Include 2' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of Adult Head

Scenario Unit: Each

Scenario Typical Size: 10.0

Scenario Total Cost: $2,895.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $289.55

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 368 - Emergency Animal Mortality Management

Scenario: #82 - Burial, Goat or Sheep

Scenario Description:

This scenario consists of the on-site burial of goat, sheep or other similarly sized animal mortalities on a small size operation resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the burial of 10 head of 100 pound average weight goats. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 3' deep plus 2' additional cover over carcasses. Construct a 12'W x 29'L (surface dimensions) burial site with appropriate cover. On site soils can be recompacted to meet required imperviousness. Include 2' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of Head

Scenario Unit: Each

Scenario Typical Size: 10.0

Scenario Total Cost: $2,519.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $251.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 368 - Emergency Animal Mortality Management

Scenario: #83 - Disposal, Cattle or Horse

Scenario Description:

This scenario consists of the disposal of cattle, horse or other similarly sized animal carcasses by methods other than burial resulting from catastrophic events not related to disease. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 5 head averaging 1000 pounds each in a landfill. The scenario includes materials, equipment time and labor to recover and transport carcasses to the landfill which is a distance of 35 miles from the farm.

Feature Measure: Number of Head

Scenario Unit: Each

Scenario Typical Size: 5.0

Scenario Total Cost: $3,316.53

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $663.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 368 - Emergency Animal Mortality Management

Scenario: #84 - Disposal, Goat or Sheep

Scenario Description:

This scenario consists of the disposal of goat, sheep or other similarly sized animal carcasses on a small size operation by methods other than burial resulting from catastrophic events not related to disease. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 10 head of goats at an average weight of 100 pounds each in a landfill. All head are counted. The scenario includes materials, equipment time and labor to recover and transport the goat carcasses to the landfill which is a distance of 35 miles from the farm.

Feature Measure: Number of Head

Scenario Unit: Each

Scenario Typical Size: 10.0

Scenario Total Cost: $2,447.31

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $244.73

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 368 - Emergency Animal Mortality Management

Scenario: #85 - Composting, Outside Windrow

Scenario Description:

This scenario consists the emergency disposal of a large number of livestock mortality by composting in a static windrow. The cause of mortality is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from inco

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. This typical scenario was developed based on the composting of 20 head of cattle averaging 1000 pound each which are moved to a location on-site that is suitable for composting. The scenario includes equipment time and labor to recover and transport carcasses to the composting location and the building an turning of the pile at the appropriate time. Composting requires 1.5 pounds of carbon per pound of animal. A small volume of green manure or waste feed is available on site. Wood chips (45 pcf) will be used as the carbon source. The composting windrow construction operation consists of 2 pieces of equipment and 1 add'l laborer: 1) collecting and transporting carcasses to compost site; 2) constructing compost windrow base using carbon material; 3) place carcasses 4) cover carcasses with green manure/waste feed; 4) cover with carbon material; 5) cap windrow with any remaining manure/feed; 6) after first heat cycle turn the windrow over and reconstruct for finishing. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of 1000 lbs. Animal

Scenario Unit: Animal Unit

Scenario Typical Size: 20.0

Scenario Total Cost: $20,899.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,044.97

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 368 - Emergency Animal Mortality Management

Scenario: #86 - Forced Air Incineration

Scenario Description:

This scenario consists the emergency disposal of a large number of livestock by a portable forced air incinerator. The cause of mortality is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. This typical scenario was developed based on the forced air incineration of the carcasses of 50 head of cattle averaging 1000 pound each. The scenario includes equipment time and labor to recover and transport carcasses to a suitable on-site incineration location and the rental and operation of a portable forced air incinerator. Wood fuel is also added to assist with the incineration process. The forced air incineration operation consists of a tractor plus operator to collect and transport carcasses to the incineration site, a portable forced air incinerator plus operator, and 1 add'l laborer. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of 1000 lbs. Animal

Scenario Unit: Animal Unit

Scenario Typical Size: 50.0

Scenario Total Cost: $18,706.92

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $374.14

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 368 - Emergency Animal Mortality Management

Scenario: #87 - Landfill or Render

Scenario Description:

This scenario consists of the disposal of animal mortality carcasses by landfilling or rendering resulting from catastrophic events not related to disease. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers disposal of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 700 finisher swine carcasses at an average weight of 200 pounds each in a landfill. The scenario includes materials, equipment time and labor to recover and transport the carcasses to the landfill which is within a 1.5 hour drive of the farm.

Feature Measure: Pounds of mortality

Scenario Unit: Pound

Scenario Typical Size: 140,000.0

Scenario Total Cost: $10,665.15

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 368 - Emergency Animal Mortality Management

Scenario: #88 - Disposal, Swine

Scenario Description:

This scenario consists of the disposal of swine or other similarly sized animal carcasses on a small size operation by methods other than burial resulting from catastrophic events not related to disease. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 1 boar at 450 pounds, 9 sows at 350 pounds each and 8 babies/sow at 12 pounds each in a landfill. The number of head counted are the sows and boar (adult swine) at 10 total head. The scenario includes materials, equipment time and labor to recover and transport the boar, sows and baby carcasses to the landfill which is a distance of 35 miles from the farm.

Feature Measure: Number of Adult Head

Scenario Unit: Each

Scenario Typical Size: 10.0

Scenario Total Cost: $2,783.94

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $278.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 368 - Emergency Animal Mortality Management

Scenario: #178 - Shallow Burial, Swine or Cattle

Scenario Description:

This scenario consists of the disposal of animal carcasses by burial in a shallow trench resulting from impacts related to the National Emergency. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, and organics being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. This scenario has been written to exclude feathered animals since early research has indicated that feathered animals do not break down quickly using this method. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560), Fence (384)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, and organics being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomp

After Situation:

Emergency animal mortalities resulting from causes not related to disease are being buried in a shallow trench, that prevents non-point source pollution of excessive nutrients, and organics being transported into surface and groundwater resources. The is a new method of mortality disposal recommended by APHIS. 50 animal units (50,000 pound) of animal mortality is the maximum allowed for this method. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the disposal of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of livestock animal mortality by burial in an 18 inch deep by 8 foot wide trench. A 12 inch thick layer of carbon material is placed in the bottom of the trench. The carcass is placed in the trench and covered with 4 inches of carbon material. Then the excavated soil is placed over the entire trench area. The scenario includes equipment time and labor to excavate the trench, place carbon layer in the trench bottom, recover and transport carcasses to the shallow burial location, place carcasses in the trench and cover with more carbon and the excavated soil. Wood chips (45 pcf) will be used as the carbon source.

Feature Measure: Number of 1000 lbs. Animal

Scenario Unit: Animal Unit

Scenario Typical Size: 50.0

Scenario Total Cost: $10,748.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $214.97

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 368 - Emergency Animal Mortality Management

Scenario: #194 - Composting, Carbon Material and Mobilization

Scenario Description:

This scenario consists of the disposal of animal carcasses by composting in a static windrow resulting from impacts related to the National Emergency. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, and organics being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors from incomplete composti

After Situation:

Emergency animal mortalities resulting from causes not related to disease are being disposed by composting in a static windrow that prevents non-point source pollution of excessive nutrients, and organics being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators. An overall plan covers the disposal of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 30,000 pounds of animal mortality by composting on-site. The scenario includes equipment time and labor to recover and transport carcasses to the composting location and the building and turning of the pile at the appropriate time. Composting requires 5 cubic yards of carbon material per 1000 pounds of animal. Wood chips (45 pcf) will be used as the carbon source.

Feature Measure: Number of 1000 lbs. Animal

Scenario Unit: Animal Unit

Scenario Typical Size: 30.0

Scenario Total Cost: $17,667.36

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $588.91

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 368 - Emergency Animal Mortality Management

Scenario: #210 - Incineration, Landfill or Render

Scenario Description:

This scenario consists of the disposal of animal carcasses by methods other than burial, incineration, landfill or rendering resulting from impacts related to the National Emergency. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens

After Situation:

Emergency animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, incineration, landfill or rendering, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the disposal of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of livestock carcasses by composting on-site. The scenario assumes the grower will provide all equipment and labor and that 50% of the carbon for composting is available on-site.

Feature Measure: Number of 1000 lbs. Animal

Scenario Unit: Animal Unit

Scenario Typical Size: 30.0

Scenario Total Cost: $11,637.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $387.91

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 372 - Combustion System Improvement

Scenario: #81 - Combustion Engine to Electric Motor, Less Than 12 Horsepower

Scenario Description:

Replace an existing older diesel engine with a new electric motor (<12 hp). The existing diesel engine may be stationary or portable, but not mobile (e.g., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units, emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality – Emissions of Particulate Matter (PM) and PM Precursors; Air Quality – Emissions of Ozone Precursors; Air Quality - Emissions of Airborne Reactive Nitrogen; Air Quality - Emissions of Greenhouse Gases; Energy – Energy Efficiency of Equipment and Facilities. Associated Practices include: 374 – Energy Efficient Agricultural Operation; 533 – Pumping Plant; 430 – Irrigation Pipeline; 441 – Irrigation System, Microirrigation; 442 – Sprinkler System; 447 – Irrigation and Drainage Tailwater Recovery; 449 – Irrigation Water Management; 516 – Livestock Pipeline; 313 – Waste Storage Facility; 634 – Waste Transfer; 642 – Water Well; and 614 – Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality: The existing internal combustion engine emissio

After Situation:

The existing older diesel engine is replaced with a new electric motor (<12 hp). The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if an existing concrete pad is not present. Air Quality: The new electric motor does not produce any on-farm emissions of particulate matter, oxides of nitrogen, or carbon dioxide, resulting in a substantial emissions reduction on the farm. Energy: Energy efficiency will be improved.

Feature Measure: Number of Combustion Unit

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,763.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,763.83

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 372 - Combustion System Improvement

Scenario: #82 - Combustion Engine to Electric Motor, 12 to 74 Horsepower

Scenario Description:

Replace an existing older diesel engine with a new electric motor (12-74 hp). The existing diesel engine may be stationary or portable, but not mobile (e.g., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units, emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality – Emissions of Particulate Matter (PM) and PM Precursors; Air Quality – Emissions of Ozone Precursors; Air Quality - Emissions of Airborne Reactive Nitrogen; Air Quality - Emissions of Greenhouse Gases; Energy – Energy Efficiency of Equipment and Facilities. Associated Practices include: 374 – Energy Efficient Agricultural Operation; 533 – Pumping Plant; 430 – Irrigation Pipeline; 441 – Irrigation System, Microirrigation; 442 – Sprinkler System; 447 – Irrigation and Drainage Tailwater Recovery; 449 – Irrigation Water Management; 516 – Livestock Pipeline; 313 – Waste Storage Facility; 634 – Waste Transfer; 642 – Water Well; and 614 – Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality: The existing internal combustion engine emissio

After Situation:

The existing older diesel engine is replaced with a new electric motor (12-74 hp). The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if an existing concrete pad is not present. Air Quality: The new electric motor does not produce any on-farm emissions of particulate matter, oxides of nitrogen, or carbon dioxide, resulting in a substantial emissions reduction on the farm. Energy: Energy efficiency will be improved.

Feature Measure: Number of Combustion Unit

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $6,641.31

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,641.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 372 - Combustion System Improvement

Scenario: #83 - Combustion Engine to Electric Motor, 75 to 149 Horsepower

Scenario Description:

Replace an existing older diesel engine with a new electric motor (75-149 hp). The existing diesel engine may be stationary or portable, but not mobile (e.g., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units, emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality – Emissions of Particulate Matter (PM) and PM Precursors; Air Quality – Emissions of Ozone Precursors; Air Quality - Emissions of Airborne Reactive Nitrogen; Air Quality - Emissions of Greenhouse Gases; Energy – Energy Efficiency of Equipment and Facilities. Associated Practices include: 374 – Energy Efficient Agricultural Operation; 533 – Pumping Plant; 430 – Irrigation Pipeline; 441 – Irrigation System, Microirrigation; 442 – Sprinkler System; 447 – Irrigation and Drainage Tailwater Recovery; 449 – Irrigation Water Management; 516 – Livestock Pipeline; 313 – Waste Storage Facility; 634 – Waste Transfer; 642 – Water Well; and 614 – Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality: The existing internal combustion engine emissio

After Situation:

The existing older diesel engine is replaced with a new electric motor (75-149 hp). The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if an existing concrete pad is not present. Air Quality: The new electric motor does not produce any on-farm emissions of particulate matter, oxides of nitrogen, or carbon dioxide, resulting in a substantial emissions reduction on the farm. Energy: Energy efficiency will be improved.

Feature Measure: Number of Combustion Unit

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $12,524.01

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12,524.01

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 372 - Combustion System Improvement

Scenario: #84 - Combustion Engine to Electric Motor, 150 to 299 Horsepower

Scenario Description:

Replace an existing older diesel engine with a new electric motor (150-299 hp). The existing diesel engine may be stationary or portable, but not mobile (e.g., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units, emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality – Emissions of Particulate Matter (PM) and PM Precursors; Air Quality – Emissions of Ozone Precursors; Air Quality - Emissions of Airborne Reactive Nitrogen; Air Quality - Emissions of Greenhouse Gases; Energy – Energy Efficiency of Equipment and Facilities. Associated Practices include: 374 – Energy Efficient Agricultural Operation; 533 – Pumping Plant; 430 – Irrigation Pipeline; 441 – Irrigation System, Microirrigation; 442 – Sprinkler System; 447 – Irrigation and Drainage Tailwater Recovery; 449 – Irrigation Water Management; 516 – Livestock Pipeline; 313 – Waste Storage Facility; 634 – Waste Transfer; 642 – Water Well; and 614 – Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality: The existing internal combustion engine emissio

After Situation:

The existing older diesel engine is replaced with a new electric motor (150-299 hp). The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if an existing concrete pad is not present. Air Quality: The new electric motor does not produce any on-farm emissions of particulate matter, oxides of nitrogen, or carbon dioxide, resulting in a substantial emissions reduction on the farm. Energy: Energy efficiency will be improved.

Feature Measure: Number of Combustion Unit

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $24,810.57

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $24,810.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 372 - Combustion System Improvement

Scenario: #85 - Combustion Engine to Electric Motor, Greater Than or Equal to 300 Horsepower

Scenario Description:

Replace an existing older diesel engine with a new electric motor (>=300 hp). The existing diesel engine may be stationary or portable, but not mobile (e.g., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units, emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality – Emissions of Particulate Matter (PM) and PM Precursors; Air Quality – Emissions of Ozone Precursors; Air Quality - Emissions of Airborne Reactive Nitrogen; Air Quality - Emissions of Greenhouse Gases; Energy – Energy Efficiency of Equipment and Facilities. Associated Practices include: 374 – Energy Efficient Agricultural Operation; 533 – Pumping Plant; 430 – Irrigation Pipeline; 441 – Irrigation System, Microirrigation; 442 – Sprinkler System; 447 – Irrigation and Drainage Tailwater Recovery; 449 – Irrigation Water Management; 516 – Livestock Pipeline; 313 – Waste Storage Facility; 634 – Waste Transfer; 642 – Water Well; and 614 – Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality: The existing internal combustion engine emissio

After Situation:

The existing older diesel engine is replaced with a new electric motor (>=300 hp). The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if an existing concrete pad is not present. Air Quality: The new electric motor does not produce any on-farm emissions of particulate matter, oxides of nitrogen, or carbon dioxide, resulting in a substantial emissions reduction on the farm. Energy: Energy efficiency will be improved.

Feature Measure: Number of Combustion Unit

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $51,362.05

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $51,362.05

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 372 - Combustion System Improvement

Scenario: #128 - Tractor Replacement, 25 to 160 Brake Horsepower

Scenario Description:

Replace an existing smaller (25-160 bhp engine size) high-emitting mobile off-road self-propelled diesel-powered agricultural tractor with a similarly-sized new lower emission mobile off-road tractor with a diesel engine that is certified to the newest available U.S. EPA engine TIER rating. The payment rate is based on the engine brake horsepower (bhp) rating of the engine in the new tractor and applies if the existing equipment cannot be repowered or retrofitted due to design constraints or operator safety. Resource Concerns: Air Quality - Emissions of Ozone Precursors; Air Quality - Emissions of Particulate Matter (PM) and PM Precursors; Air Quality - Emissions of Airborne Reactive Nitrogen.

Before Situation:

An older, higher-emitting diesel-powered tractor is used on an agricultural/forestry operation. The emissions of oxides of nitrogen and/or particulate matter are identified to contribute to an air quality resource concern . Air Quality: The existing diese

After Situation:

A new lower-emitting mobile off-road diesel tractor replaces the existing higher-emitting system; the tractor being replaced will be disabled and a certificate of inoperability submitted prior to certification of practice completion. Air Quality: The new mobile off-road diesel tractor will be cleaner-burning and will emit less oxides of nitrogen and/or particulate matter than the previous existing tractor.

Feature Measure: Engine Size (bhp) of Engine i

Scenario Unit: Brake Horse Power

Scenario Typical Size: 100.0

Scenario Total Cost: $64,507.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $645.07

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 372 - Combustion System Improvement

Scenario: #129 - Tractor Replacement, Greater Than 160 Brake Horsepower

Scenario Description:

Replace an existing larger (>160 bhp engine size) high-emitting mobile off-road self-propelled diesel-powered agricultural tractor with a similarly-sized new lower emission mobile off-road tractor with a diesel engine that is certified to the newest available U.S. EPA engine TIER rating. The payment rate is based on the engine brake horsepower (bhp) rating of the engine in the new tractor and applies if the existing equipment cannot be repowered or retrofitted due to design constraints or operator safety. Resource Concerns: Air Quality - Emissions of Ozone Precursors; Air Quality - Emissions of Particulate Matter (PM) and PM Precursors; Air Quality - Emissions of Airborne Reactive Nitrogen.

Before Situation:

An older, higher-emitting diesel-powered tractor is used on an agricultural/forestry operation. The emissions of oxides of nitrogen and/or particulate matter are identified to contribute to an air quality resource concern. Air Quality: The existing diesel

After Situation:

A new lower-emitting mobile off-road diesel tractor replaces the existing higher-emitting tractor; the tractor being replaced will be disabled and a certificate of inoperability submitted prior to certification of practice completion. Air Quality: The new mobile off-road diesel tractor will be cleaner-burning and will emit less oxides of nitrogen and/or particulate matter than the previous existing tractor.

Feature Measure: Engine Size (bhp) of Engine i

Scenario Unit: Brake Horse Power

Scenario Typical Size: 250.0

Scenario Total Cost: $251,191.96

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,004.77

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #3 - Plate Cooler

Scenario Description:
The installation of all stainless steel dual pass plate cooler, type 316 stainless steel. Practice certification will be through receipts and pictures from the applicant.

Before Situation:
Inefficient milk cooling (minimal pre-cooling of milk before entering the bulk tank).

After Situation:
High-efficiency milk cooling system which reduces energy use. The new milk cooling equipment will pre-cool the milk and reduce overall power requirements (kW) compared to the existing milk cooling system (where most of the cooling was accomplished in the bulk tank) as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $6,155.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,155.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #4 - Scroll Compressor

Scenario Description:

Install a new scroll compressor, associated controls, wiring, and materials to retrofit an existing refrigeration system. A new condenser is not included in this typical scenario. Typical scenario includes a new 5 horsepower scroll compressor.

Before Situation:

Inefficient reciprocating compressor as a key component of the refrigeration system used to cool milk. The compressor is a critical part of a milk cooling system, affecting milk quality, system reliability, and system efficiency.

After Situation:

A more efficient scroll compressor, which will reduce energy use, is evidenced by the energy audit. A comparably sized scroll compressor provides refrigeration capacity at a higher efficiency than a reciprocating compressor. Newer scroll compressor systems typically reduce electricity use by 15 to 25 percent compared to reciprocating compressors. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,130.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,130.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #7 - Motor, Greater Than 100 Horsepower

Scenario Description:

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is larger than 100 horsepower.

Before Situation:

The system is inefficient with a standard efficiency motor.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Number of motors

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $23,611.24

Total Cost per Unit: $23,611.24

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #9 - Motor, 2 to 9 Horsepower

Scenario Description:

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is larger than 1 and less than 10 horsepower.

Before Situation:

The system is inefficient with a standard efficiency motor.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Number of motors

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,106.36

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,106.36

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #10 - Motor, Less Than or Equal to One Horsepower

Scenario Description:

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is less than or equal to 1 horsepower.

Before Situation:

The system is inefficient with a standard efficiency motor.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Number of motors

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $694.61

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $694.61

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #11 - Radiant Brooder

Scenario Description:

Replace "pancake" Brood Heaters in a poultry house with Radiant Brood heaters. Replacement will require the materials and labor to remove existing heating system, re-plumb gas lines, cables and wench system to retrofit new radiant tube heaters, and miscellaneous items to complete the installation. Alternate acceptable radiant heating systems can include radiant brooders and quad radiant systems as evidenced by the energy audit.

Before Situation:

Inefficient heat distribution equipment, such as conventional "pancake" brood heaters. The Pancake brooder, mounted at a low installation height, primarily warms the air. They provide a one-to-two foot perimeter at desired temperatures around each brooder

After Situation:

Energy use is reduced through installation of a more efficient heater. Radiant heaters primarily warm objects within a direct line of sight (similar to the sun or an open fire). Air temperature is of relatively little importance for a radiant heating systems to be effective. As a result, radiant systems are typically installed 5' or more above the floor level. This height extends the distribution of the radiant heat over a larger area than is possible with pancake style heaters. A roughly 16' diameter radiant heat zone heats over twice that of a conventional pancake brooder. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Number of heaters

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $397.20

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $397.20

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #12 - Radiant Tube

Scenario Description:

Replace "pancake" Brood Heaters in a poultry house with Radiant Tube Heaters. Replacement will require the materials and labor to remove existing heating system, re-plumb gas lines, cables and wench system to retrofit new radiant tube heaters, and miscellaneous items to complete the installation. Alternate acceptable radiant heating systems can include radiant brooders and quad radiant systems as evidenced by the energy audit.

Before Situation:

Inefficient heat distribution equipment, such as conventional "pancake" brood heaters. The Pancake brooder, mounted at a low installation height, primarily warms the air. They provide a one-to-two foot perimeter at desired temperatures around each brooder

After Situation:

Energy use is reduced through installation of a more efficient heater. Radiant heaters primarily warm objects within a direct line of sight (similar to the sun or an open fire). Air temperature is of relatively little importance for a radiant heating systems to be effective. As a result, radiant systems are typically installed 5' or more above the floor level. This height extends the distribution of the radiant heat over a larger area than is possible with pancake style heaters. A roughly 16' diameter radiant heat zone heats over twice that of a conventional pancake brooder. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Number of heaters

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,802.63

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,802.63

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #13 - Radiant Quad

Scenario Description:

Replace "pancake" Brood Heaters in a poultry house with Radiant Quad Heaters. Replacement will require the materials and labor to remove existing heating system, re-plumb gas lines, cables and wench system to retrofit new radiant tube heaters, and miscellaneous items to complete the installation. Alternate acceptable radiant heating systems can include radiant brooders and quad radiant systems as evidenced by the energy audit.

Before Situation:

Inefficient heat distribution equipment, such as conventional "pancake" brood heaters. The Pancake brooder, mounted at a low installation height, primarily warms the air. They provide a one-to-two foot perimeter at desired temperatures around each brooder

After Situation:

Energy use is reduced through installation of a more efficient heater. Radiant heaters primarily warm objects within a direct line of sight (similar to the sun or an open fire). Air temperature is of relatively little importance for a radiant heating systems to be effective. As a result, radiant systems are typically installed 5' or more above the floor level. This height extends the distribution of the radiant heat over a larger area than is possible with pancake style heaters. A roughly 16' diameter radiant heat zone heats over twice that of a conventional pancake brooder. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Number of heaters

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,414.20

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,414.20

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #14 - Heater, High Efficiency

Scenario Description:

Replace existing low efficiency heaters with new high efficiency heaters. High-efficiency heating systems include any heating unit with efficiency rating of 80%+ for fuel oil and 90%+ for natural gas and propane. Applications may be air heating/building environment and hydronic (boiler) heating for agricultural operations, including under bench, or root zone heating. An alternative to heater replacement might be the addition of climate control system and electronic temperature controls with +/- 1 degree F differential, to reduce the annual run time.

Before Situation:

Buildings heated with low efficiency heaters or heaters without proper electronic climate controls

After Situation:

Higher efficiency heaters reduce energy consumption, energy costs, and GHG emissions. These replacement systems can be fueled by natural gas, propane, or fuel oil. Associated practices/activities: 122-AgEMP - HQ and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Rated Heat Output

Scenario Unit: 1,000 BTU/Hour

Scenario Typical Size: 750.0

Scenario Total Cost: $17,989.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $23.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #15 - Attic Heat Recovery Vents

Scenario Description:

Install actuated inlets or automatic latching gravity inlets that draw warmer, drier air from the attic to assist with moisture and heat control when ventilation fans are being operated in poultry houses and swine barns. Other systems to transfer heat, as detailed in ASABE S612-compliant energy audit may also be used. Based on a 40' x 500' poultry house.

Before Situation:

Heated buildings with attic spaces but no means to transfer heat between the heated space, attic, and ambient (outside) air when relative conditions allow for reduced energy use.

After Situation:

Attic vents or inlets allow dry warm air from the attic to circulated through out the building. By using pre-warmed air from the attic less energy is needed for heating 122-AgEMP - HQ and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Number of Inlets

Scenario Unit: Each

Scenario Typical Size: 14.0

Scenario Total Cost: $3,165.82

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $226.13

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #20 - System, Evaporative Cooling

Scenario Description:

An evaporative cooling system is installed into a facility such as a greenhouse, poultry house or other livestock facility to replace an existing inefficient cooling system, or on a specialty crop farm with an inefficient refrigeration system that is used to quick-cool harvested vegetables, fruits and/or cut flowers;

Before Situation:

An existing cooling system is in place that is inefficient.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Square ft.

Scenario Unit: Square Foot

Scenario Typical Size: 100.0

Scenario Total Cost: $1,909.38

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $19.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #99 - Evaporator, Oil-Fired

Scenario Description:

This scenario is for the replacement of an inefficient evaporator with a new high efficiency evaporator and appurtenances for maple syrup processing. A high efficiency evaporator is designed to increase BTU output from the fuel source and provide a larger flue pan surface area to increase evaporation, thus reducing energy use. Oil-fired evaporator includes stainless steel sides and bottom, oil burner, parametric controls, and stainless-steel syrup and flue pans. A 4' x 12' oil-fired evaporator with parametric controls is common for moderately sized maple operations in the region.

Before Situation:

The evaporative process time for making concentrated maple syrup is extended and more fuel used because the inefficient evaporator requires more boiling to remove water from the sap.

After Situation:

The evaporative process time for making concentrated maple syrup is reduced by 50% or more and fuel consumption by 15% or more. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Associated practices/activities: DIA-120, CMA-228, and other activities within 374-Farmstead Energy Improvement.

Feature Measure: Area of Evaporator Unit

Scenario Unit: Square Foot

Scenario Typical Size: 48.0

Scenario Total Cost: $38,693.46

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $806.11

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #100 - Reverse Osmosis, Greater Than or Equal to 1,000 Gallons per Hour

Scenario Description:

Maple Syrup Processing Reverse Osmosis (RO) unit is installed before the evaporator, filters the sap and removes approximately 75% of the water prior to getting to the evaporator. The size of the RO is determined based on the existing maple syrup operation (number of taps and the capacity of the evaporator). With a RO unit able to remove excess water, it takes less time to boil the sap down, thus saving significant energy (oil and wood fuel) used in the process. The system cost includes the RO unit, pump, vessel, membrane, wash tank, and installation. Use for units rated greater than or equal to 1000 GPH. Typical capacity of the RO unit is 1200 GPH.

Before Situation:

A maple sugaring operation uses an evaporator (pan over a furnace) to boil sap to remove water to create syrup. It takes approximately 20 gallons of sap to make 1 gallon of syrup, which means 19 gallons of water has to be boiled off. A typical oil-fired e

After Situation:

With an efficient RO installed in the process, approximately 75% of the water is removed from the sap, thus cutting the boil time down by approximately 75%. An efficiency of 1-gallon fuel oil (or equivalent wood) per gallon of maple syrup is possible, thereby reducing energy consumption by 65-75%. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Associated practices/activities: DIA-120, CMA-228, and other activities within 374-Farmstead Energy Improvement.

Feature Measure: Capacity of RO Unit

Scenario Unit: Gallons per Hour

Scenario Typical Size: 1,200.0

Scenario Total Cost: $26,631.91

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $22.19

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #101 - Reverse Osmosis, Less Than or Equal to 250 Gallons per Hour

Scenario Description:

Maple Syrup Processing Reverse Osmosis (RO) unit is installed before the evaporator, filters the sap and removes approximately 75% of the water prior to getting to the evaporator. The size of the RO is determined based on the existing maple syrup operation (number of taps and the capacity of the evaporator). With a RO unit able to remove excess water, it takes less time to boil the sap down, thus saving significant energy (oil and wood fuel) used in the process. The system cost includes the RO unit, pump, vessel, membrane, wash tank, and installation. Use for units rated at 250 GPH or less. Typical capacity of the RO unit is 135 GPH.

Before Situation:

A maple sugaring operation uses an evaporator (pan over a furnace) to boil sap to remove water to create syrup. It takes approximately 20 gallons of sap to make 1 gallon of syrup, which means 19 gallons of water has to be boiled off. A typical oil-fired e

After Situation:

With an efficient RO installed in the process, approximately 75% of the water is removed from the sap, thus cutting the boil time down by approximately 75%. An efficiency of 1 gallon fuel oil (or equivalent wood) per gallon of maple syrup is possible, thereby reducing energy consumption by 65-75%.The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Associated practices/activities: DIA-120, CMA-228, and other activities within 374-Farmstead Energy Improvement.

Feature Measure: Capacity of RO Unit

Scenario Unit: Gallons per Hour

Scenario Typical Size: 135.0

Scenario Total Cost: $6,136.84

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $45.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #102 - Evaporator, Wood-Fired

Scenario Description:

This scenario is for the replacement of an inefficient evaporator with a new high efficiency evaporator and appurtenances for maple syrup processing. A high efficiency evaporator is designed to increase BTU output from the fuel source and provide a larger flue pan surface area to increase evaporation, thus reducing energy use. Wood-fired gasifier evaporator includes stainless steel sides and bottom, blowers, and stainless-steel syrup and flue pans. A 3' x 12' wood-fired gasifier evaporator is common for moderately sized maple operations in the region.

Before Situation:

The evaporative process time for making concentrated maple syrup is extended and more fuel used because the inefficient evaporator requires more boiling to remove water from the sap.

After Situation:

The evaporative process time for making concentrated maple syrup is reduced by 50% or more and fuel consumption by 40% or more over standard wood evaporator. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Associated practices/activities: DIA-120, CMA-228, and other activities within 374-Farmstead Energy Improvement.

Feature Measure: Area of Evaporator Unit

Scenario Unit: Square Foot

Scenario Typical Size: 36.0

Scenario Total Cost: $41,711.92

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,158.66

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #103 - Reverse Osmosis, 251 to 999 Gallons per Hour

Scenario Description:

Maple Syrup Processing Reverse Osmosis (RO) unit is installed before the evaporator, filters the sap and removes approximately 75% of the water prior to getting to the evaporator. The size of the RO is determined based on the existing maple syrup operation (number of taps and the capacity of the evaporator). With a RO unit able to remove excess water, it takes less time to boil the sap down, thus saving significant energy (oil and wood fuel) used in the process. The system cost includes the RO unit, pump, vessel, membrane, wash tank, and installation. Use for units rated greater than 250 GPH and less than 1000 GPH. Typical capacity of the RO unit is 365 GPH.

Before Situation:

A maple sugaring operation uses an evaporator (pan over a furnace) to boil sap to remove water to create syrup. It takes approximately 20 gallons of sap to make 1 gallon of syrup, which means 19 gallons of water has to be boiled off. A typical oil-fired e

After Situation:

With an efficient RO installed in the process, approximately 75% of the water is removed from the sap, thus cutting the boil time down by approximately 75%. An efficiency of 1-gallon fuel oil (or equivalent wood) per gallon of maple syrup is possible, thereby reducing energy consumption by 65-75%. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Associated practices/activities: DIA-120, CMA-228, and other activities within 374-Farmstead Energy Improvement.

Feature Measure: Capacity of RO Unit

Scenario Unit: Gallons per Hour

Scenario Typical Size: 365.0

Scenario Total Cost: $10,563.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $28.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #104 - Preheater, Less Than or Equal to 24 Square Feet

Scenario Description:

A Maple Syrup Processing high efficiency sap pre-heater device is installed over the evaporator pan and uses steam from the evaporator pan to pre-heat the sap to as high as 200ºF while at the same time injecting air into the sap to promote evaporation. Use for pre-heater devices less than or equal to 24 sq. ft. Evaporation rates are increased by 65-75%, based on vendor analysis, leading to 40-43% energy savings. Sap is concentrated from Brix 2% to 4% or more before it enters the flue pan. Steam-enhanced systems require at least 9 feet from floor to ceiling. The typical size of pre-heater device for this scenario is 12 sq. ft. With increased evaporation, it takes less time to boil the sap down, thus saving significant energy (oil & wood fuel) used in the process, as well as labor.

Before Situation:

The evaporative process time for making concentrated maple syrup requires boiling approximately 20 gallons of sap to make 1 gallon of syrup, which means 19 gallons of water have to be boiled off, using more fuel and labor. A typical oil-fired evaporator c

After Situation:

The evaporative process time for making concentrated maple syrup requires boiling approximately 6 gallons of sap to make 1 gallon of syrup, which means 14 gallons of water were removed by the steam-enhanced system, using less fuel and labor. A typical oil-fired evaporator with a steam pan consumes 2.1 to 2.7 gallons of fuel oil for each gallon of maple syrup produced to remove water from the sap, improving the fuel efficiency and saving labor. The resource concern is inefficient use of energy in the farm operation which increases dependence on nonrenewable energy sources and can be addressed through improved energy efficiency. Associated practices/activities: DIA-120, CMA-228, and other activities within 374-Farmstead Energy Improvement.

Feature Measure: Area of Pre-heater Device

Scenario Unit: Square Foot

Scenario Typical Size: 12.0

Scenario Total Cost: $14,408.76

Total Cost per Unit: $1,200.73

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #105 - Preheater, Greater Than 24 Square Feet

Scenario Description:

A Maple Syrup Processing high efficiency sap pre-heater device is installed over the evaporator pan and uses steam from the evaporator pan to pre-heat the sap to as high as 200ºF while at the same time injecting air into the sap to promote evaporation. Use for pre-heater devices greater than 24 sq. ft. Evaporation rates are increased by 65-75%, based on vendor analysis, leading to 40-43% energy savings. Sap is concentrated from Brix 2% to 4% or more before it enters the flue pan. Steam-enhanced systems require at least 9 feet from floor to ceiling. The typical size of pre-heater device for this scenario is 40 sq. ft. With increased evaporation, it takes less time to boil the sap down, thus saving significant energy (oil & wood fuel) used in the process, as well as labor.

Before Situation:

The evaporative process time for making concentrated maple syrup requires boiling approximately 20 gallons of sap to make 1 gallon of syrup, which means 19 gallons of water have to be boiled off, using more fuel and labor. A typical oil-fired evaporator c

After Situation:

The evaporative process time for making concentrated maple syrup requires boiling approximately 6 gallons of sap to make 1 gallon of syrup, which means 14 gallons of water were removed by the steam-enhanced system, using less fuel and labor. A typical oil-fired evaporator with a steam pan consumes 2.1 to 2.7 gallons of fuel oil for each gallon of maple syrup produced to remove water from the sap, improving the fuel efficiency and saving labor. The resource concern is inefficient use of energy in the farm operation which increases dependence on nonrenewable energy sources and can be addressed through improved energy efficiency. Associated practices/activities: DIA-120, CMA-228, and other activities within 374-Farmstead Energy Improvement.

Feature Measure: Area of Pre-heater Device

Scenario Unit: Square Foot

Scenario Typical Size: 40.0

Scenario Total Cost: $24,612.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $615.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #153 - Alley Scraper

Scenario Description:

The application of this practice consists of the installation of an electric powered alley scraper system to replace the use of tractors or skid steers for scraping and transferring manure in barn alleyways. Approximately 1 scraper is needed per 60 head of cows.

Before Situation:

The scraping and transferring manure with tractors or skid steers use energy inefficiently. Inefficient energy use, greenhouse gas emissions by mobile combustion equipment, and a recommendation to implement the improvement has been identified by an ASABE

After Situation:

A new, electric, alley scraper is installed to minimize the use of combustion systems for scraping and transferring manure. An analysis of the estimated annual energy savings is completed that includes estimating the annual gallons of fuel saved. Greenhouse gas emission reductions are computed and offset by the annual electric consumption of the alley scraper. The tractor or skid steer will not be used to scrape and transfer manure where the ally scraper is installed. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Number of alley scrapers

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $32,109.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $32,109.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #169 - System, Automatic Controller

Scenario Description:

The application of this practice consists of an automatic control system installed on a manually controlled agricultural system that is functioning. Typical components may include, but are not limited to, any of the following: wiring, sensors, data logger, logic controller, software, switches, and relay. The new automatic control system will be used to reduce energy use by equipment, or to reduce fuel use by mobile equipment that is used to travel to manually verify or adjust systems.

Before Situation:

A manually controlled system uses energy inefficiently in an agricultural operation. To reduce energy use, the system should be modified to either automatically control equipment directly or to minimize travel by vehicles, trucks, tractors, etc. to manual

After Situation:

Energy use is reduced by proper controls of equipment or by reducing the number of trips by vehicles to monitor and control equipment. An analysis of the estimated annual energy savings is completed. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,711.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,711.73

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #185 - Telemetry

Scenario Description:

The application of this practice consists of an automatic control system with wireless communications installed on a manually controlled agricultural system that is functioning. Typical components may include, but are not limited to, any of the following: wiring, sensors, data logger, logic controller, communication link, software, switches, and relay. The new automatic control system will be used to reduce energy use by equipment, or to reduce fuel use by mobile equipment that is used to travel to manually verify or adjust systems.

Before Situation:

A manually controlled system uses energy inefficiently in an agricultural operation. To reduce energy use, the system should be modified to either automatically control equipment directly or to minimize travel by vehicles, trucks, tractors, etc. to manual

After Situation:

Energy use is reduced by proper controls of equipment or by reducing the number of trips by vehicles to monitor and control equipment. An analysis of the estimated annual energy savings is completed. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,218.26

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,218.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #202 - Preheater, Sap

Scenario Description:

A passive (not enhanced) sap preheater is installed over the evaporator pan and uses steam from the evaporator pan to preheat the sap prior to entering the boiling pan. Heated sap takes much less time to boil, saving significant energy (oil or wood fuel) used in the process, as well as labor. This device can increase the efficiency of an evaporator pan by 15-20% by reducing the time it takes to boil sap into syrup. This scenario is for installing all passive sap preheater units.

Before Situation:

The maple syrup process requires boiling approximately 43 gallons of sap to make 1 gallon of syrup which means 42 gallons of water must be evaporated. A typical oil-fired evaporator consumes 3.5 to 4.5 gallons of fuel oil for each gallon of maple syrup pr

After Situation:

Typical size is for a sap preheater that is installed over a 10 sq. ft flue pan size. Sap temperature is increased to near boiling temperature before entering the evaporator flue (back) pan reducing the time, fuel, and labor required to make maple syrup. The resource concern is inefficient use of energy in the farm operation which increases dependence on nonrenewable energy sources and can be addressed through improved energy efficiency. Associated practices/activities: DIA 120, CEMA 228, and other activities within CPS 374 Energy Efficient Agricultural Operation.

Feature Measure: Square Feet of Evaporator Fl

Scenario Unit: Square Foot

Scenario Typical Size: 10.0

Scenario Total Cost: $2,315.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $231.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #203 - Ventilation, Exhaust

Scenario Description:

Replacement of a conventional exhaust fan with high volume, low speed, efficient exhaust fan. Fans being installed should be models previously tested by BESS Lab or the Air Movement and Control Association and be in top 20 percentile of fans tested

Before Situation:

Inefficient ventilation in an agricultural building. The resource concern is inefficient use of energy in the farm operation which increases dependence on nonrenewable energy sources and can be addressed through improved energy efficiency. Any improvement

After Situation:

High-efficiency ventilation system which reduces energy use. Typical scenario is replacement of old fan with new energy efficient 54" fan. The new ventilation equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing ventilation system as evidenced in an energy audit. Associated practices/activities: may include CEMA 228, DIA 120 and other activities within 374-Energy Efficient Agricultural Operation

Feature Measure: Each Fan Replaced

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,425.13

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,425.13

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 378 - Pond

Scenario: #1 - Excavated Pit

Scenario Description:

A low-hazard water impoundment structure on agricultural lands to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. Pond is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment. Earthen spillway is constructed as needed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the pond will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railr

After Situation:

The typical pond is constructed by excavating 3100 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

Feature Measure: Excavated Volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 3,100.0

Scenario Total Cost: $6,475.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 378 - Pond

Scenario: #2 - Embankment Pond without Pipe (Region)

Scenario Description:

A water impoundment structure on agricultural land to improve water quality or to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with an earthen auxiliary spillway. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind.

After Situation:

The typical pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 3100 cubic yards to create an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The earthen auxiliary spillway will be constructed as designed. No principle spillway pipe will be used. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

Feature Measure: Embankment Volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 3,100.0

Scenario Total Cost: $6,631.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.14

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 378 - Pond

Scenario: #3 - Embankment Pond with Drop Inlet Pipe

Scenario Description:

A low-hazard water impoundment structure on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with a principle spillway conduit and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind.

After Situation:

The typical low hazard pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 3100 cubic yards to create an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The principle spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

Feature Measure: Embankment Volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 3,100.0

Scenario Total Cost: $10,615.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 378 - Pond

Scenario: #4 - Embankment Pond with Hood Inlet Pipe

Scenario Description:

A low-hazard water impoundment structure on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with a hood inlet principle spillway conduit and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind.

After Situation:

The typical low hazard pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 3100 cubic yards to create an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The principle spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

Feature Measure: Embankment Volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 3,100.0

Scenario Total Cost: $9,600.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.10

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #1 - One Row, Manual Plant Shrubs

Scenario Description:

Single 500 foot row of shrubs for wind protection, wildlife habitat, or snow management. Shrubs planted by hand 4 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, or to manage snow deposition. Additional wildlife food and cover.

Feature Measure: length of windbreak row(s)

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $374.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.75

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #2 - One Row, Manual Plant Trees

Scenario Description:

Single 500 foot row of conifer tree seedlings for wind protection, wildlife habitat, or snow management. Trees planted by hand 10 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, or to manage snow deposition. Additional wildlife food and cover.

Feature Measure: length of windbreak row(s)

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost:	$164.74	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$0.33	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #3 - Two Rows, Machine Plant Shrubs

Scenario Description:

Two 500 foot rows of shrubs for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Shrubs planted with a tree planting machine 4 feet apart in the row with rows 16 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost:	$431.22	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$0.86	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #4 - Two Rows, Machine Plant Trees with No Tubes

Scenario Description:

Two 500 foot rows of hardwood trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Herbivores (deer, rabbits, etc.) are NOT expected to browse tree seedlings, tree protection is not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $471.21

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #5 - Two Rows, Machine Plant Trees with Tubes

Scenario Description:

Two 500 foot rows of hardwood tree seedlings for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Herbivore (deer, rabbits, etc.) damage is likely, so each tree must be protected with a rigid tube tree shelter. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $1,413.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.83

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #6 - Three or More Rows, Manual Plant Shrubs

Scenario Description:

Three or more 500 foot rows of shrubs for wind protection, energy conservation, wildlife habitat, air quality, snow management. Shrubs planted with a tree planting machine, 4 feet apart in the row with rows 16 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $930.32

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #7 - Three or More Rows, Machine Plant Trees with No Tubes

Scenario Description:

Three or more 500 foot rows of trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. The outside rows are conifers the inside row(s) are hardwoods. Trees 10 feet apart with rows 16 feet apart, planted with a tree planting machine. Herbivores are not expected to browse planted seedlings, so tree shelters are not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $436.77

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.87

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #8 - Three or More Rows, Machine Plant Trees with Tubes

Scenario Description:

Three or more 500 foot rows of hardwood trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Herbivore (deer, rabbits, etc.) damage is likely, so each tree must be protected with a rigid tube tree shelter. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $1,724.34

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.45

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #32 - Mixed Trees and Shrubs

Scenario Description:

Five 500 foot row of mixed species (conifer trees and Southern Bayberry - Myrica cerifera shrubs) to establish an environmental buffer, typically adjacent to a poultry house, but also used for other sites. This windbreak also serves by providing wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted within the rows staggered to allow for a multitude of natural vegetation to come up within and between the rows. This will strengthen the screening affect. Trees planted by hand; all trees, except for the cedars, planted as bare rooted seedlings with holes dug by hand. The Eastern Red Cedars will be planted from 3-5gal. pots with the holes augered. The Loblolly and Cedars will be planted staggered 10 ft. between trees and rows. The Southern Bayberry will be planted 5 ft. within the one row they occupy and 5 ft. from the last row of trees. Herbivores (deer, rabbits, etc.) are NOT expected to browse tree seedlings, tree protection is not needed. This practice is typically applied along the side of poultry houses, but can be used to screen other environmental concerns. Resource concerns to be addressed include: Air Quality Impacts (emission of particulate matter, objectionable odors); Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Environmental buffer/windbreak established that provides multiple functions and benefits: visual screening, odor plume and other pollutant reduction, wind velocity reduced, energy losses due to wind reduced, wind driven snow deposition affected; in addition, wildlife habitat provided (food, cover, nesting, etc.), as well as visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $1,884.21

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.77

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #121 - One Row, Small

Scenario Description:
One row of containerized shrubs planted to address resource concerns; Inefficient Energy Use, Air Quality Impacts and/or Fish and Wildlife Habitat. This practice is typically applied on cropland at field edges and around homesteads.

Before Situation:
Agricultural field or farmstead needing protections from wind, additional wildlife food and cover, odor mitigation, visual screening. The area generally includes arid or drought conditions that greatly reduce the success of tree survival.

After Situation:
A windbreak of containerized shrubs is installed by hand planting shrubs 6 ft apart. Wind velocity suitably diminished to reduce soil erosion or energy loss. Additional wildlife food and cover, mixing of odor plumes and visual screening. Greatly improved success rate of the windbreak due to the supplemental water during establishment.

Feature Measure: Length of windbreak row

Scenario Unit: Foot

Scenario Typical Size: 100.0

Scenario Total Cost: $456.45

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.56

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #182 - Two Rows, Machine Plant Trees

Scenario Description:

Two 500 foot rows of hardwood trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Herbivores (deer, rabbits, etc.) are NOT expected to browse tree seedlings, tree protection is not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $471.21

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #183 - Two Rows, Machine Plant Trees with Shelters

Scenario Description:

Two 500 foot rows of hardwood tree seedlings for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Environmental impacts are likely, so each tree must be protected with a rigid tube tree shelter. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $1,413.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.83

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #184 - Three or More Rows, Manual Plant Trees

Scenario Description:

Three or more 500 foot rows of trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. The outside rows are conifers the inside row(s) are hardwoods. Trees 10 feet apart with rows 16 feet apart, planted with a tree planting machine. Planted seedlings are not likely to be impacted by environmental stressors, so tree shelters are not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $436.77

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.87

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #185 - Three or More Rows, Machine Plant Trees with Shelters

Scenario Description:

Three or more 500 foot rows of hardwood trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Environmental impacts are likely, so each tree must be protected with a rigid tube tree shelter. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $1,724.34

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.45

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #186 - Renovation, Removal of Trees and Shrubs, Manual Plant

Scenario Description:

Windbreak/shelterbelt renovation to remove and replace deteriorated, damaged, diseased, or unsuitable trees or shrubs. The treatment may include removal of entire rows, or removal of selected trees/shrubs in order to prepare for the necessary planting of replacement trees and shrubs within the footprint of an existing windbreak, to improve the health and function of the windbreak. Supplemental plantings of bare root and/or containerized trees/shrubs, of conifer and/or deciduous species, or mixtures, are applied to improve the effectiveness and longevity of the windbreak. Windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment. Resource concerns include: Plant pest pressure, Plant productivity and health, Inadequate livestock shelter, Wind erosion.

Before Situation:

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches,

After Situation:

The integrity of 726 linear feet (one acre) of windbreak/shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

Feature Measure: Length of Renovation

Scenario Unit: Foot

Scenario Typical Size: 726.0

Scenario Total Cost: $3,241.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.47

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #187 - Renovation, Greater Than 8 Inches Diameter Breast Height, Manual Plant

Scenario Description:

Windbreak/shelterbelt renovation to remove and replace deteriorated, damaged, diseased, or unsuitable trees or shrubs. The treatment may include removal of entire rows, or removal of selected trees/shrubs in order to prepare for the necessary planting of replacement trees and shrubs within the footprint of an existing windbreak, to improve the health and function of the windbreak. The treatment uses mechanized equipment to remove trees and/or shrubs with average DBH >8 inches. Trees and shrubs are cleared with a Dozer. All woody debris from cutting and pruning is either scattered and crushed, piled and crushed, chipped, or removed from the treatment area. Hand planting is used to replace the trees/shrubs that were removed, improving the effectiveness and longevity of the windbreak. Various types and combinations of plant materials may be used, including bare root and/or containerized trees/shrubs, and conifer and/or deciduous species or mixtures. Windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment. Resource concerns include: Plant pest pressure, Plant productivity and health, Inadequate livestock shelter, Wind erosion.

Before Situation:

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches,

After Situation:

The integrity of 726 linear feet (one acre) of windbreak/ shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

Feature Measure: Length of Renovation

Scenario Unit: Foot

Scenario Typical Size: 726.0

Scenario Total Cost: $4,678.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.44

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 381 - Silvopasture

Scenario: #1 - Native Perennial Grass, Commercial

Scenario Description:
Commercial thinning of an existing stand of trees followed by establishment of native grasses.

Before Situation:
10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant

After Situation:
The stand is thinned commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Since thinning is done commercially, no harvesting costs are incurred. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of native warm-season grasses will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture establi

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $5,289.64

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $528.96

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 381 - Silvopasture

Scenario: #2 - Introduced Perennial Grass, Commercial

Scenario Description:
Commercial thinning of an existing stand of trees followed by establishment of introduced grasses.

Before Situation:
10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant

After Situation:
The stand is thinned commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Since thinning is done commercially, no harvesting costs are incurred. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of introduced grass and legume species will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture establi

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $4,423.74

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $442.37

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 381 - Silvopasture

Scenario: #3 - Native Perennial Grass, Non-Commercial

Scenario Description:
Non-commercial thinning of an existing stand of trees followed by establishment of native grasses.

Before Situation:
10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant

After Situation:
The stand is thinned non-commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of native warm-season grasses will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture establi

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $7,592.68

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $759.27

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 381 - Silvopasture

Scenario: #4 - Introduced Perennial Grass, Non-Commercial

Scenario Description:
Non-commercial thinning of an existing stand of trees followed by establishment of introduced grasses.

Before Situation:
10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant

After Situation:
The stand is thinned non-commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of introduced grass and legume species will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture establi

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $6,726.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $672.68

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 381 - Silvopasture

Scenario: #5 - Bareroot Hardwood and Native Perennial Grass, Abandoned Field

Scenario Description:
Establishment of trees and native grasses into a field that contains neither suitable forage nor suitable tree cover for a silvopasture system.

Before Situation:
10-acre abandoned crop field to be converted to silvopasture or a poorly managed or abandoned pasture that does not contain suitable forage or tree cover to be successfully managed for pasture or forest production. The vegetation consists of a low percent

After Situation:
Undesirable tree and shrub species and debris removed. All tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of native warm-season grasses will be established, providing forage to livestock and wildlife. Trees will be planted at the proper spacing and arrangement to be managed for silvopasture providing adequate livestock shelter and a commercially viable timber product or tree crop over the long term. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture establi

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $14,038.49

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,403.85

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 381 - Silvopasture

Scenario: #6 - Establish conifer trees, introduced grasses and legumes in an abandoned field

Scenario Description:
Establishment of trees and introduced grasses and legumes into a field that contains neither suitable forage nor suitable tree cover for a silvopasture system.

Before Situation:
10-acre abandoned crop field to be converted to silvopasture or a poorly managed or abandoned pasture that does not contain suitable forage or tree cover to be successfully managed for pasture or forest production. The vegetation consists of a low percent

After Situation:
Undesirable tree and shrub species and debris removed. All tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of introduced grass and legumes species will be established, providing forage to livestock and wildlife. Trees will be planted at the proper spacing and arrangement to be managed for silvopasture providing adequate livestock shelter and a commercially viable timber product or tree crop over the long term. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture establi

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $6,258.94

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $625.89

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 381 - Silvopasture

Scenario: #7 - Bareroot Hardwood and Native Perennial Grass, Open Field

Scenario Description:
Establishment of trees and native grasses into a field that contains neither suitable forage nor suitable tree cover for a silvopasture system.

Before Situation:
10-acre crop field to be converted to silvopasture. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production

After Situation:
The soil is prepared for planting using chemical and mechanical means, then a mix of native warm-season grasses will be established, providing forage to livestock and wildlife. Trees will be planted at the proper spacing and arrangement to be managed for silvopasture providing adequate livestock shelter and a commercially viable timber product or tree crop over the long term. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture establi

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $12,886.97

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,288.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 381 - Silvopasture

Scenario: #8 - Bareroot Conifer, Introduced Perennial Grass, and Legumes in Open Field

Scenario Description:
Establishment of trees and introduced grasses and legumes into a field that contains neither suitable forage nor suitable tree cover for a silvopasture system.

Before Situation:
10-acre crop field to be converted to silvopasture. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production

After Situation:
The soil is prepared for planting using chemical and mechanical means, then a mix of introduced grass and legumes species will be established, providing forage to livestock and wildlife. Trees will be planted at the proper spacing and arrangement to be managed for silvopasture providing adequate livestock shelter and a commercially viable timber product or tree crop over the long term. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture establi

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $5,107.42

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $510.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 381 - Silvopasture

Scenario: #9 - Bareroot Hardwood, Pasture

Scenario Description:
Establishment of trees into an existing pasture that contains adequate native or introduced forage.

Before Situation:
10-acre pasture has inadequate livestock shelter resulting in loafing and overuse and wear of pasture on partially shaded field boundary. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Livestock Production

After Situation:
Appropriate tree species are selected and the spacing and layout arrangement is determined for optimum stem density. The existing pasture sod is suppressed by mechanical or chemical means to provide competition control to benefit tree seedling growth. Trees are planted and properly protected until they are established well enough to allow livestock grazing without significant stand loss. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture establi

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $6,307.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $630.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 381 - Silvopasture

Scenario: #10 - Bareroot Conifer in Existing Pasture

Scenario Description:
Establishment of trees into an existing pasture that contains adequate native or introduced forage.

Before Situation:
10-acre pasture has inadequate livestock shelter resulting in loafing and overuse and wear of pasture on partially shaded field boundary. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Livestock Production

After Situation:
Appropriate tree species are selected and the spacing and layout arrangement is determined for optimum stem density. The existing pasture sod is suppressed by mechanical or chemical means to provide competition control to benefit tree seedling growth. Trees are planted and properly protected until they are established well enough to allow livestock grazing without significant stand loss. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture establi

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,277.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $127.77

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 381 - Silvopasture

Scenario: #11 - Potted Hardwood, Pasture

Scenario Description:

Small diversified mixed livestock and crop farm interested in adding value to their operation. This scenario describes establishment of low-density, high-value trees, for example walnuts, pecans, apples or pears, etc. (not orchards) into an existing pasture that contains adequate native or introduced forage. The added value eventually to be achieved will be in nuts, fruit, and/or wood plus shade provided to livestock in the intervening years. Small operations typical, but this scenario could fit many other livestock and mixed crop and livestock operations.

Before Situation:

10-acre pasture has inadequate livestock shelter resulting in loafing and overuse and wear of pasture on partially shaded field boundary. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Livestock Production

After Situation:

Appropriate tree species are selected and the spacing and layout arrangement is determined to match tree product and livestock management goals. The existing pasture sod is suppressed by mechanical or chemical means to provide competition control to benefit tree seedling growth. Trees are planted and properly protected until they are established well enough to allow livestock grazing without significant stand loss. All Resource Concerns listed above are addressed. Associated practice: 484 Mulching for mats to inhibit weeds around base of each tree; Tree management, including pruning to encourage height and shade objectives, to be developed and followed via consultation with district forester.

Feature Measure: Acres of silvopasture establi

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,897.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $289.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #1 - Electric

Scenario Description:

A beef cattle operation where livestock currently have access to surface waters. The fence is needed to exclude the livestock from 1,320 ft. of riparian zone. The fence is built with wood posts buried in the ground. It has 4 strands of high tensile wire that are electrified. The fence has 4 corners and one gate is included to facilitate livestock movement.

Before Situation:

Livestock have open access to water resources and/or other sensitive areas causing degradation of resources. Degradation would include soil erosion, water quality, plant health and vigor, and wildlife habitat.

After Situation:

Permanent fence is installed to protect the riparian areas and/or other sensitive areas from degradation by livestock. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat.

Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $4,787.74

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.63

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #2 - Electric, Difficult Terrain

Scenario Description:

A beef cattle operation where livestock currently have access to surface waters. The fence is needed to exclude the livestock from 1,320 ft. of riparian zone. The fence is built with wood posts buried in the ground. It has 4 strands of high tensile wire that are electrified. The fence has 6 corners and one gate is included to facilitate livestock movement. A higher payment is justified for this scenario due to the additional corners, braces and posts required for mountainous site and corresponding increase in labor to install the fence.

Before Situation:

Livestock have open access to water resources and/or other sensitive areas causing degradation of resources. Degradation would include soil erosion, water quality, plant health and vigor, and wildlife habitat.

After Situation:

Permanent fence is installed to protect the riparian areas and/or other sensitive areas from degradation by livestock. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat.

Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $5,918.44

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.48

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #3 - Barbed Wire

Scenario Description:

A cow-calf pasture where livestock currently have access to surface waters. The fence is needed to exclude the livestock from 1,320 ft. of riparian zone. The fence is built with wood posts driven into the ground. It has 5 strands of galvanized barbed wire with lower strands spaced closer together than upper strands (spacing of 6", 6", 10", 10", 12"). One gate is included to facilitate livestock movement.

Before Situation:

Livestock have open access to water resources and/or other sensitive areas causing degradation of resources. A robust fence is needed to prevent livestock damaging fence, or escaping it in order to reach lush forage in the riparian zone. The soils are li

After Situation:

Permanent fence is installed to protect the riparian areas and/or other sensitive areas from degradation by livestock. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat.

Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $5,848.21

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.43

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #4 - High Tensile, Three Strands for Interior Barrier

Scenario Description:

A constructed interior barrier for implementing prescribed grazing of livestock (usually cattle). Fence includes wood posts driven into the ground with three strands of high tensile wire and 1 gate built according to state FOTG standards. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat.

Before Situation:

Grazing distribution is less then optimal. Plants are either over or underutilized causing degradation of organic matter or spot grazing.

After Situation:

Permanent fence is installed to divide pasture into paddocks. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat.

Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $3,856.46

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.92

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #5 - High Tensile, Three Strands for Mountainous Area

Scenario Description:

A constructed interior barrier for implementing prescribed grazing of livestock (usually cattle). Fence includes charger, wood posts driven into the ground with three strands of high tensile wire and 1 gate built according to state FOTG standards. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat. A higher cost is justified for this scenario due to the rough, undulating terrain and or additional corners braces and posts required for mountainous areas as determined by each state.

Before Situation:

Grazing distribution is less then optimal. Plants are either over or underutilized causing degradation of organic matter or spot grazing.

After Situation:

Permanent fence is installed to divide pasture into paddocks. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat.

Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $4,482.88

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.40

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #6 - Woven Wire (Region)

Scenario Description:

A 2.5 acre, small ruminant pasture where the livestock currently have access to surface waters. The fence is needed to exclude the livestock from 1,320 ft. of riparian zone. The fence is built with wood posts buried into the ground, 48" woven wire fabric, a barbed wire strand on bottom and top, and fasteners. The fence has 4 corners and one gate is included to facilitate livestock movement.

Before Situation:

Livestock have open access to water resources and/or other sensitive areas causing degradation of resources. Degradation would include soil erosion, water quality, plant health and vigor, and wildlife habitat.

After Situation:

Permanent fence is installed to protect the riparian areas from degradation by livestock. Benefits of the practice are managed livestock grazing intensity, duration and frequency, reduced soil erosion, improved water quality, improved plant health and vigor, and/or improved wildlife habitat.

Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $5,858.13

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.44

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #7 - Poly Wire

Scenario Description:

Installing a polywire fence with step in/fiberglass posts on 50' centers and all appurtenances to control movement of grazing animals in an managed grazing system such as stockpiling or strip grazing. Polywire power source provided by connection to perimeter electric fence.

Before Situation:

Forage use is inefficient and this effects plant condition negatively. The resource concerns to be addressed by this practice are poor grazing distribution, inadequate water supply, and degraded site conditions leading to poor animal health.

After Situation:

The practice facilitates improved forage utilization. Associated Practices: Prescribed Grazing, Pipeline, Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical Area Planting, Access Control

Feature Measure: Feet of fence installed

Scenario Unit: Foot

Scenario Typical Size: 1,300.0

Scenario Total Cost: $362.03

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.28

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #8 - Poly Wire with Charger

Scenario Description:
Installing a polywire fence with step in/fiberglass posts on 50' centers, solar energizer, and all appurtenances to control movement of grazing animals in a managed grazing system such as stockpiling, strip grazing, or silvopasture.

Before Situation:
Forage use is inefficient and this effects plant condition negatively. The resource concerns to be addressed by this practice are poor grazing distribution, inadequate water supply, and degraded site conditions leading to poor animal health.

After Situation:
The practice facilitates improved forage utilization. Associated Practices: Prescribed Grazing, Pipeline, Water Well, Spring Development, Heavy Use Area, Pumping Plant, Watering Facility, Forage and Biomass Planting, Critical Area Planting, Access Control

Feature Measure: Feet of fence installed

Scenario Unit: Foot

Scenario Typical Size: 1,300.0

Scenario Total Cost: $745.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #9 - Confinement

Scenario Description:

A confinement fence is installed around a 60'x180', heavy use area to keep cattle confined away from pasture during non-grazing periods. This scenario is priced using a typical specification for 5 strand high tensile wire and wood posts buried in the ground at 6-foot spacing. One gate is included to facilitate livestock movement in and out of the confinement area. Resource conservation benefits of this practice scenario, used in combination with other supporting and facilitating practices (such as Heavy Use Area and Prescribed Grazing) include improving water quality and forage plant condition.

Before Situation:

Cattle feed and lounge in an area where their waste contaminates a stream. In addition, forage in the vicinity of lounging area is over-utilized, and poor quality due to the over grazing and soil compaction.

After Situation:

Cattle lounge and feed confined inside the heavy use area during non-grazing periods. Surface water contamination is reduced and forage condition recovers on the pasture.

Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 480.0

Scenario Total Cost: $4,154.92

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.66

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #10 - Safety

Scenario Description:

A barrier (fence) implemented on an NRCS constructed waste storage system according to engineering design to exclude human access. Permanently installed fence built to (1) keep humans away from waste ponds & lagoons, or (2) to protect sensitive areas (riparian areas, wetlands, springs, etc.) from heavy livestock pressure. Heavy grade fence materials and close post spacing required. Fence is typically installed by a contactor and includes labor and materials.

Before Situation:

Where a NRCS designed and constructed waste storage pond is planned whereby significant risk to human safety is determined to be evident. Livestock has access to sensitive areas that may cause detrimental effect to animal/human health and wildlife habitat

After Situation:

Humans and livestock are excluded from the waste storage pond for safety purposes by installing a fence around a waste holding pond. The fence would typically be 100 wide x 175 long with one gate and installed by a fencing contractor. Woven wire fence with one strand of barb wire on top with a gate. Improved livestock control and access to water or other sensitive areas will promote safety for livestock/humans improve health, vigor of sensitive species, limiting soil erosion, and condition.

Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 450.0

Scenario Total Cost: $4,244.97

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9.43

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #115 - Barbed or Smooth Wire, Multi-Strand

Scenario Description:

Multi-strand, Barbed or Smooth Wire - Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Constructed using fencing materials rather than a pre-manufactured gate.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. R

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, etc... Four strand wire is commonly installed. Fence will be installed with wildlife friendly considerations.

Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $3,881.11

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #116 - Barbed or Smooth Wire for Difficult Terrain, Multi-Strand

Scenario Description:

Barbed, Smooth ,or Woven Wire Difficult Installation - Installation of fence in difficult situations will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Constructed using fencing materials rather than a pre-manufactured gate.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. R

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, brace posts, etc... Fence will be installed with wildlife friendly considerations.

Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $5,047.48

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.82

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #117 - Woven Wire

Scenario Description:

Woven - Installation of fence will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Woven wire is typically used in applications with sheep, goats, hogs, wildlife exclusion, shelterbelt/tree protection, etc. Constructed using fencing materials rather than a pre-manufactured gate.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, livestock access to water bodies is uncontrolled

After Situation:

Installation of fence will allow for implementation of a rotational grazing plan that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Woven wire fence includes posts, wire, fasteners, gates, etc... Woven wire is typically used in applications with sheep, goats, hogs, wildlife exclusion, shelterbelt/tree protection, etc.

Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $5,001.80

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.79

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #152 - Woven Wire, 96 Inch

Scenario Description:

Woven Wire fencing installed for large livestock such as Bison, large ungulate herbivores, captive cervidae that are not domesticated. Because of the size and behavior differences relative to domesticated livestock, fences, handling facilities and loading facilities must be more robust to accommodate bison. Fence allows for the implementation of a grazing management under a CPS 528 Prescribed Grazing plan. Fence facilities the movement of livestock for forage management and protection of sensitive areas. All fence components are included. Fence encloses <= 20 acres or 2640 foot linear run connection with 5-8 wire fencing. Install fence with considerations for wildlife corridors.

Before Situation:

Livestock have access to forage and sensitive areas without management of intensity, duration and frequency of grazing events. Plant productivity and health is degraded. Water quality may be impaired by sediment and livestock access to water.

After Situation:

Installation of the tall woven wire high tensile electric fence allows for grazing management to be implemented. Fence is installed to specifications meeting the producer's objective and livestock type. Fence is installed with wildlife friendly considerations and known wildlife corridors.

Feature Measure: length

Scenario Unit: Foot

Scenario Typical Size: 2,640.0

Scenario Total Cost: $21,595.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #168 - High Tensile, Eight Wire Electric

Scenario Description:

A high tensile wire fence which is electrified for large livestock such as Bison, large ungulate herbivores, captive cervidae that are not domesticated. Eight strands of wire are used for visual barrier with a minimum of 3 wires electrified. Fence allows for the implementation of a grazing management plan. Because of the size and behavior differences relative to domesticated livestock, fences, handling facilities and loading facilities must be more robust to accommodate bison. Fence allows for the implementation of grazing management under CPS Prescribed Grazing plan. Fence facilities the movement of livestock for forage management and protection of sensitive areas. All fence components are included. Fence encloses 40 acres. Install fence considering wildlife and known wildlife corridors.

Before Situation:

Livestock have access to forage and sensitive areas without management of intensity, duration and frequency of grazing events. Plant productivity and health is degraded. Water quality may be impaired by sediment and livestock access to water.

After Situation:

Installation of the 8 wire high tensile electric fence allows for grazing management to be implemented. Fence is installed to specifications meeting the producer's objective and livestock type. Fence is installed with wildlife friendly considerations and known wildlife corridors.

Feature Measure: length

Scenario Unit: Foot

Scenario Typical Size: 5,280.0

Scenario Total Cost: $18,078.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 382 - Fence

Scenario: #184 - High Tensile, Five Wire Electric

Scenario Description:

A five strand high tensile wire fence which is electrified for large livestock such as Bison, large ungulate herbivores, captive cervidae that are not domesticated. Because of the size and behavior differences relative to domesticated livestock, fences, handling facilities and loading facilities must be more robust to accommodate bison. Fence allows for the implementation of a grazing management under CPS 528 Prescribed Grazing plan. Fence facilities the movement of livestock for forage management and protection of sensitive areas. All fence components are included. Fence encloses 40 acres. Install fence considering wildlife friendly design and adjustment for wildlife corridors.

Before Situation:

Livestock have access to forage and sensitive areas without management of intensity, duration and frequency of grazing events. Plant productivity and health is degraded. Water quality may be impaired by sediment and livestock access to water.

After Situation:

Installation of the 5 wire high tensile electric fence allows for grazing management to be implemented. Fence is installed to specifications meeting the producer's objective and livestock type. Fence is installed with wildlife friendly considerations and known wildlife corridors.

Feature Measure: length

Scenario Unit: Foot

Scenario Typical Size: 5,280.0

Scenario Total Cost: $16,219.92

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.07

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 383 - Fuel Break

Scenario: #53 - Mechanical and Chemical Application

Scenario Description:

Fuel Break installation requires tree thinning, treating woody residue, pruning, and mowing. Thinning treatment and pruning is done by hand, treating woody residue (piling/burning, crushing, or off-site removal) and mowing are mechanized. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Forest stand is overstocked with desirable and undesirable trees. Overstocking creates conditions conducive to wildfire movement across the landscape, and severe loss/damage of the forest stand. Shrub levels are high and significantly increase wildfire ri

After Situation:

Fuel Break is installed at the property line or a key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory, branches on remaining trees are pruned to 8 to 10 feet in height, all woody residue (thinned trees and pruned branches) are treated (piled/burned or lopped/scattered) so little remains in the fuel break and understory vegetation is mowed down to less than 1 foot in height. Cut stumps have been chemically treated to control sprouting.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 4.0

Scenario Total Cost: $7,921.22

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,980.30

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 383 - Fuel Break

Scenario: #54 - Mechanical and Chemical Application, Steep Slopes

Scenario Description:

Fuel Break installation requires tree thinning, treating woody residue, pruning, and brush cutting. Thinning treatment, tree pruning and brush cutting are done by hand, treating woody residue (piling/burning, crushing, or off-site removal) is mechanized and hand treatment. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

The forest stand is overstocked with trees (desirable and undesirable) and is at risk of loss if a wildfire should occur. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory,

After Situation:

Fuel Break is installed at the property line or key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue, thinned trees, pruned branches and cut brush, are treated.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 4.0

Scenario Total Cost: $12,998.32

Total Cost per Unit: $3,249.58

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 383 - Fuel Break

Scenario: #55 - Mechanical and Chemical Application with Masticator

Scenario Description:

Fuel Break installation requires tree thinning, treating woody residue, pruning, and mowing. Thinning treatment and pruning is done by hand; treating woody residue (piling/burning, crushing, or off-site removal) and mowing are mostly mechanized. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

The forest stand is overstocked with trees (desirable and undesirable) and is at risk of loss if a wildfire should occur. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory,

After Situation:

Fuel Break is installed at the property line or key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory, branches on remaining trees are pruned to 8 to 10 feet in height, all woody residue (thinned trees, pruned branches and brush) are mostly masticated but some is piled/burned, hauled of site or lopped/scattered) understory vegetation is cut down to less than 1 foot in height. Cut stumps have been chemically treated to control sprouting.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 4.0

Scenario Total Cost: $8,116.32

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,029.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 383 - Fuel Break

Scenario: #56 - Mechanical and Chemical Application with Masticator, Steep Slopes

Scenario Description:

Fuel Break installation requires tree thinning, treating woody residue, pruning, and brush cutting. Thinning is mechanized and hand cutting, tree pruning and brush cutting are done by hand, treating woody residue (piling/burning, crushing, or off-site removal) is mechanized and some hand treatment. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

The forest stand is overstocked with trees (desirable and undesirable) and is at risk of loss if a wildfire should occur. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory,

After Situation:

Fuel Break is installed a the property line or a key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory, branches on remaining trees are pruned to 8 to 10 feet in height, all woody residue (thinned trees, pruned branches and brush) are mostly masticated but some is piled/burned, hauled of site or lopped/scattered) so little remains in the fuel break and understory vegetation is cut down to less than 1 foot in height. Cut stumps have been chemically treated to control sprouting.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 4.0

Scenario Total Cost: $11,516.71

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,879.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 383 - Fuel Break

Scenario: #57 - Manual Application

Scenario Description:

Fuel Break installation requires tree thinning, treating woody residue, pruning, and mowing. Thinning treatment, pruning, brush cutting and treating woody residue (piling/burning, crushing, or off-site removal), is done by hand. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Forest stand is overstocked with desirable and undesirable trees. Overstocking creates conditions conducive to wildfire movement across the landscape, and loss of the forest stand. Excess stocking is impacting the health of the desired forest ecosystem an

After Situation:

A fuel break is installed by hand cutting trees, hand pruning remaining trees, piling and burning or removal of woody residue from tree cutting and pruning. FB installation is at property lines, around structures, at roadways, or other key locations to reduce continuity of vegetation cover. Width of fuel break varies based on site conditions.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 4.0

Scenario Total Cost: $10,313.44

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,578.36

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 383 - Fuel Break

Scenario: #58 - Mechanical Application, Non-Forest Land

Scenario Description:

A non forest fuel break occurs outside of forestlands where brush, grass and forbs dominate. Land uses where this scenario will be applied may be range, pasture or wetlands. The fuel break area is mowed/bushhog so standing vegetation is reduced to a low height. Resource concerns are degraded plant condition - wildfire hazard.

Before Situation:

Wildfire movement is a concern within the designated area. Vegetation is tall, dense and continuous creating conditions conducive for fire movement across the landscape.

After Situation:

A fuel break is installed by shredding/mowing/bushhogging a defined width at property lines, around structures, at roadways, or other key locations to reduce continuity of vegetation cover. Width of fuel break varies based on site conditions.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 4.0

Scenario Total Cost: $1,423.96

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $355.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 384 - Woody Residue Treatment

Scenario: #2 - Restoration, Conservation Treatment After Catastrophic Events

Scenario Description:

The use of a combination of hand (chainsaw) and heavy equipment similar to those used in logging to treat slash resulting from catastrophic events such as fire, wind, severe pest outbreak, ice storm, etc. This scenario will remove/treat the larger material the size of which is consistent with the large equipment used. Resource concerns include: Excessive plant pest pressure, Potential emissions of particulate matter, Wildfire hazard from excessive biomass accumulation, and Habitat degradation.

Before Situation:

A large amount of slash and woody residue is created as a result of a non-silvicultural event such as a wind storm, wildfire, ice storm, pest outbreak, etc. Because the slash and residue is created by a catastrophic event that can cause tree-lodging, snag

After Situation:

The material resulting from the catastrophic event is reduced to a level that will minimize the resource concerns.

Feature Measure: Acres of affected forest

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $16,752.09

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $837.60

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 384 - Woody Residue Treatment

Scenario: #7 - Mechanical and Manual Control, Chipper and Shredder

Scenario Description:

Treating an area of forest or undergrowth slash of undesirable species to reduce hazardous fuels and the risk of insect and disease, improve organic matter, avoid resprouting and reduce erosion while improving water quality. Removal of slash for undesirable species allows better effectiveness for undesirable species. Slash is treated with both hand (cutting, lopping, etc.) and mechanically (masticating, chipping, etc.) and/or piled in a desirable location. Typically done by hand and light equipment. Resource concerns include: Wildfire hazard from excessive biomass accumulation and potential excessive plant pest pressure, plant productivity and invasive species control.

Before Situation:

Woody material resulting from a silvicultural practice such as pruning, removal or a light thinning operation is causing both fire hazard and pest issues.

After Situation:

Fire and pest issues are reduced with slash spread out and in contact with the ground. Competition to desirable species is reduced and Invasive species are controlled allowing any required secondary treatments to be more effective.

Feature Measure: Acre Treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,827.97

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $182.80

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 384 - Woody Residue Treatment

Scenario: #49 - Mechanical and Manual Control for Slash, Less Than 5 Tons per Acre

Scenario Description:

This scenario treats woody residue that is considered to be of low complexity. Low complexity could include residue amount, size, volatility and accessibility by equipment. An increase in one factor could cause the use of the medium scenario. Typically, treatment is implemented by hand tools and light equipment to lop and scatter, hand pile to reduce continuity of woody residue that addresses a resource concerns. In General, these could be used following a light thinning/pruning. Resource concerns include Excessive plant pest pressure, Air Quality emissions, Wildfire hazard from excessive biomass accumulation, and degraded plant condition and habitat.

Before Situation:

Area has low amount of woody residue (i.e. <5 tons/ac, 6in diameter) that is easily accessible. Residue was created by management activity or natural weather event that is causing a resource concern or potential resource concern.

After Situation:

The residue is treated to an acceptable level to address the resource concern.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $5,723.65

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $143.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 384 - Woody Residue Treatment

Scenario: #65 - Mechanical and Manual Control for Slash, 5 to 15 Tons per Acre

Scenario Description:

This scenario treats woody residue that is considered to be a medium complexity. Medium complexity could include residue amount, size, volatility, and accessibility by equipment (moderate terrain). An increase in any of these factors could cause the need for the Heavy scenario. Typical treatment is implemented by medium sized equipment such as chipper, masticator, skid steer to reduce the dimensions of the woody residue to address resource concerns. Resource concerns include; Excessive plant pest pressure, Air Quality emissions, Wildfire hazard from excessive biomass accumulation, and degraded plant condition and habitat.

Before Situation:

Area has moderate amount of woody residue (i.e. 5-15 tons/ac, 8-12 in diameter). Residue was created by management activity or natural weather event that is causing a resource concern or potential resource concern.

After Situation:

The residue is treated to an acceptable level to address resource concern.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $12,314.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $615.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 384 - Woody Residue Treatment

Scenario: #81 - Mechanical and Manual Control for Slash, Greater Than 15 Tons per Acre

Scenario Description:

This scenario treats woody residue that is considered to be a high complexity. high complexity could include residue amount, size, volatility, and accessibility by equipment (steep/rough terrain). Typical treatment is implemented by heavy sized equipment such as masticators, mulchers, drum choppers, (Hand work with chainsaws could be used on steep slopes) to reduce the dimensions of the woody residue to address resource concerns. Resource concerns include: Excessive plant pest pressure, Air Quality emissions, Wildfire hazard from excessive biomass accumulation, and degraded plant condition and habitat.

Before Situation:

Area has high amount of woody residue (i.e. >15 tons/ac, >12 in diameter). Residue was created by management activity or natural weather event that is causing a resource concern or potential resource concern.

After Situation:

The residue is treated to an acceptable level to address resource concern

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $34,271.82

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,713.59

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 384 - Woody Residue Treatment

Scenario: #97 - Restoration/conservation treatment following catastrophic events

Scenario Description:

Use equipment to treat slash and woody reside within an area following a Catastrophic Event such as fire, wind, severe pest outbreak, ice storm, etc. to help restore/rehabilitate the site. Resource concerns could include: Excessive plant pest pressure, Air Quality emissions, Wildfire hazard from excessive biomass accumulation, and degraded plant condition and habitat.

Before Situation:

A large amount of slash and woody residue is created as a result of a Catastrophic event. The event has caused tree-lodging, snags, broken tops, etc.; and treatment is both difficult and dangerous. The presence of this material causes many adverse effects

After Situation:

The material resulting from the catastrophic event is reduced to a level that will minimize the resource concerns.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $52,606.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,630.34

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 384 - Woody Residue Treatment

Scenario: #113 - Air Curtain Burner

Scenario Description:
Addressing Air Quality Emissions Resource concerns by using an air curtain burner to replace open pile burning.

Before Situation:
Woody residue would typically be burned in open piles, resulting in substantial air quality issues

After Situation:
Air quality concerns are lessened by using air curtain burner instead of open pile burning.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $11,316.76

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $226.34

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 386 - Field Border

Scenario: #5 - Native Species

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of organic seed for herbaceous species.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field

After Situation:

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices while creating a buffer between organic systems and conventional cropping systems. Native grasses and legumes will be established in the field border to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall be adapted to the site, not function as a host for diseases of a field crop, and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: number of acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $232.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $232.29

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 386 - Field Border

Scenario: #6 - Introduced Species

Scenario Description:
A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of introduced species.

Before Situation:
Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field

After Situation:
The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Introduced grasses and legumes will be established in the field border to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall be adapted to site, will not function as a host for diseases of a field crop, and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $150.69

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $150.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 386 - Field Border

Scenario: #7 - Pollinator

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of pollinator friendly species.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field

After Situation:

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Pollinator herbaceous plantings will provide species which flower throughout the growing season. This provides a source of nectar for adult pollinators and a diversity of herbaceous material for immature pollinator life stages and for nesting. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall be adapted to site, will not function as a host for diseases of a field crop, and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $647.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $647.24

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 386 - Field Border

Scenario: #19 - Native Species, Foregone Income

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of native species. The area of the field border is taken out of production.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field

After Situation:

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Native grasses, legumes and forbs will be established in the field borders to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: number of acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $628.55

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $628.55

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 386 - Field Border

Scenario: #20 - Introduced Species, Foregone Income

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of introduced species. The area of the field border is taken out of production.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field

After Situation:

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Introduced grasses and legumes will be established for the field border to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species of grasses, legumes, forbs or shrubs shall be selected that are adapted to site, will not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost:	$546.95	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$546.95	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 386 - Field Border

Scenario: #21 - Pollinator, Foregone Income

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of pollinator friendly herbaceous species. The area of the field border is taken out of production.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field

After Situation:

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Pollinator herbaceous plantings will provide species which flower throughout the growing season. This provides a source of nectar for adult pollinators and a diversity of herbaceous material for immature pollinator life stages and for nesting. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall meet the pollinator habitat requirements of the state and be adapted to site; not function as a host for diseases of a field crop and; have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,043.50

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,043.50

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 386 - Field Border

Scenario: #77 - Field Border, Small

Scenario Description:
A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of introduced plant species.

Before Situation:
Before practice conditions may vary based on farm size and location. Fields may have erosion by wind or water. Site provides little wildlife food or cover or pollinator habitat. Site soil organic matter is depleting. Particulate matter as dust is generate

After Situation:
The 386 Implementation Requirements have been developed and applied for the site. Field border widths are based on NRCS local design criteria specific to the purpose for installing the practices. Species selected shall be adapted to site and not host disease or pests of the adjacent field crop. Species have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: planted area

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 2.0

Scenario Total Cost: $162.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $81.01

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 390 - Riparian Herbaceous Cover

Scenario: #1 - Native Perennial Grasses, Legumes, and Forbs Mix, Medium Density

Scenario Description:

Warm Season Grasses with Forbs: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). This practice can be used nation wide. The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of primarily warm season grasses, legumes, and/or forbs tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking).

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community with

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: Acres of Riparian Herbaceou

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $385.21

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $385.21

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 390 - Riparian Herbaceous Cover

Scenario: #2 - Native Perennial Grasses, Legumes, and Forbs Mix

Scenario Description:

Cool Season Grasses with Forbs: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). This practice can be used nation wide. The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of primarily cool season grasses, legumes, and/or forbs tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking).

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community with

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: Acres of Riparian Herbaceou

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $204.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $204.56

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 390 - Riparian Herbaceous Cover

Scenario: #3 - Pollinator Habitat

Scenario Description:

Pollinator Habitat: This scenario addresses inadequate pollinator habitat consisting of a herbaceous plant community. It functions to provide diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to provide the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Upland Wildlife Habitat Management (645) , Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). This practice can be used nationwide. The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of primarily native forbs and a warm season grass to provide forage for pollinators. Selected species will be tolerant to the site conditions planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking).

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community with

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. Plants established provide pollinator food sources and nesting areas. The quality and quantity of the riparian zone components are managed to support the pollinators that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: wildlife habitat, stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: Acres of Riparian Herbaceou

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $631.57

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $631.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 390 - Riparian Herbaceous Cover

Scenario: #39 - Native Perennial Grasses, Low Density

Scenario Description:

Warm Season Grasses: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). This practice can be used nation wide. The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of warm season grasses tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking).

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community with

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: Acres of Riparian Herbaceou

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $216.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $216.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 390 - Riparian Herbaceous Cover

Scenario: #40 - Introduced Cool Season Grasses

Scenario Description:

Cool Season Grasses: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). This practice can be used nation wide. The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of only cool season grasses tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking).

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community with

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: Acres of Riparian Cover

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $120.26

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $120.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #1 - Cuttings

Scenario Description:

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of tree and/or shrub poles and live stakes (whips) planted by hand. Materials will be from a nearby, off-site location. The ratio of whips to poles will be 5:1. The cuttings will be planted in a mosaic pattern while still dormant. Tree mesh will be placed on the large cuttings. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and or

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $7,405.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,702.89

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #2 - Bare-root, hand planted, conifers, hardwoods, shrubs

Scenario Description:

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planted bare-root shrubs, evergreen, and deciduous trees. One third of the area will be planted to each woody plant type. Planting for shrubs will be done at 6' x 6' spacing, evergreen tree spacing will be 12' x 15' and deciduous tree spacing at 15' x 15'. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and or

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit: Acre

Scenario Typical Size: 3.0

Scenario Total Cost: $4,544.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,514.67

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #3 - Bare-root, machine planted, conifers, hardwoods, shrubs

Scenario Description:

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of machine planted bare-root shrubs, evergreen, and deciduous trees. One third of the area will be planted to each woody plant type. Planting for shrubs will be done at 6' x 6' spacing, evergreen tree spacing will be 12' x 15' and deciduous tree spacing at 15' x 15'. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and or

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit: Acre

Scenario Typical Size: 3.0

Scenario Total Cost: $4,967.60

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,655.87

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #4 - Small container, hand planted, conifers, hardwoods, shrubs

Scenario Description:

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planted small containerized shrubs, evergreen, and deciduous trees. One third of the area will be planted to each woody plant type. Planting for shrubs will be done at 6' x 6' spacing, evergreen tree spacing will be 12' x 15' and deciduous tree spacing at 15' x 15'. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and or

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit: Acre

Scenario Typical Size: 3.0

Scenario Total Cost: $19,298.42

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,432.81

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #5 - Large container, hand planted, conifers, hardwoods, shrubs

Scenario Description:

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planted large containerized shrubs, evergreen, and deciduous trees. One third of the area will be planted to each woody plant type. Trees and shrubs will be strategically placed at an average of 48 per acre (30' x 30' spacing if evenly distributed). Tree shelters will be placed on the hardwoods and evergreens. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and or

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit: Acre

Scenario Typical Size: 3.0

Scenario Total Cost: $9,879.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,293.10

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #6 - Bare root shrubs, 300 stems per acre, no tubes

Scenario Description:

Establish a buffer of hardwood shrubs or trees into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand or machine planted bare-root deciduous trees. General, tree spacing is 12' x 12'; (302 trees per acre) however, other spacing may be used depending on the objectives. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of production to install the riparian buffer. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 484 Mulching

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and or

After Situation:

A buffer of trees will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of Riparian Forest Buff

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $2,097.14

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,048.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #7 - Shrub Planting, 680 stems per acre, no tubes

Scenario Description:

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planted or machine planting bare-root shrubs. Generally, planting for shrubs will be done at 8' x 8' spacing however, other spacings may be used depending on the objective. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of production to install the riparian buffer. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 484 Mulching

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and or

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of Riparian Forest Buff

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $3,504.89

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,752.44

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #8 - Shrub Planting, 871 stems per acre, no tubes

Scenario Description:

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planted or machine planting bare-root shrubs. Generally, planting for shrubs will be done at 5' x 10' spacing however, other spacings may be used depending on the objective. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of production to install the riparian buffer. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 484 Mulching

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and or

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of Riparian Forest Buff

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $4,170.94

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,085.47

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #9 - Bare Root Hardwoods with tubes, 110 trees per acre

Scenario Description:

Establish a buffer of hardwood trees into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand or machine planted bare-root deciduous trees. General, tree spacing is 20' x 20'; (110 trees per acre) however, other spacing may be used depending on the objectives. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of production to install the riparian buffer. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 484 Mulching

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and or

After Situation:

A buffer of trees will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of Riparian Forest Buff

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $14,930.09

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,493.01

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #10 - Bare Root Hardwoods with tubes, 150 trees per acre

Scenario Description:

Establish a buffer of hardwood trees into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand or machine planted bare-root deciduous trees. General, tree spacing is 15' x 20'; (150 trees per acre) however, other spacing may be used depending on the objectives. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of production to install the riparian buffer. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 484 Mulching

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and or

After Situation:

A buffer of trees will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of Riparian Forest Buff

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $20,050.32

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,005.03

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #11 - Bare Root Hardwoods with tubes, 300 trees per acre

Scenario Description:

Establish a buffer of hardwood trees into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand or machine planted bare-root deciduous trees. General, tree spacing is 12 X 12 (300 trees per acre) however, other spacing may be used depending on the objectives. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of production to install the riparian buffer. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 484 Mulching

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and or

After Situation:

A buffer of trees will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of Riparian Forest Buff

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $32,779.70

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,277.97

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #12 - Riparian Forest Buffer, FI Unplanted

Scenario Description:

Establish a buffer of trees and/or shrubs on cropland in a corn-wheat-soybean rotation that is suitable to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body and extend the minimum required width. Trees and shrubs are established without planting, by using natural regeneration and existing vegetation available from soil seed-bank, over bank flooding, or seed rain. During establishment year, the new buffer is marked to prevent accidental damage by field cultivation or spraying operations.

Before Situation:

Cropland in the geomorphic floodplain and adjacent to a perennial stream or canal. The Field is used to produce row-crops such as corn, wheat and soybeans grown in rotation. Active bank erosion is depositing sediment, nutrients and organics in the riparia

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the resource concerns of Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Feature Measure: Area of Riparian Buffer Plan

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $659.74

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $329.87

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #14 - Natural regeneration with some limited tree planting

Scenario Description:

Establish a buffer of trees and shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planted deciduous tree whips at a tree spacing of 40' x 40' (25 trees per acre). The area will be sprayed twice to remove existing heavy fescue sod and planted to a companion planting (once under 490 to kill fescue and once under 391 at planting to kill remaining competition). This will allow for natural regeneration and existing vegetation available from adjacent seed tree sources as well as from soil seed bank to establish and fill in between the planted trees at a 40'x40' spacing. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Payment includes trees, equipment and labor to plant trees and a companion planting (foregone income for the land taken out of production to install the riparian buffer not allowed per PS Notice 16-11). Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control.

Before Situation:

Cropland and pasture in the geomorphic floodplain and adjacent to a perennial stream or watercourse. The field is used to produce row-crops such as corn, wheat and soybeans grown in rotation or pasture for grazing. Active bank erosion is depositing sedime

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the resource concerns of Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Feature Measure: Acre of riparian forest buffe

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $765.21

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $765.21

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #48 - Small area hand planting with container or bare root stock

Scenario Description:

Establish a small (<1 ac) buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and provide conservation benefits. The buffer will be located adjacent to a watercourse or waterbody and designed with dimensions and plant spacings that fully implement the practice. The planting will consist of hand-planted containerized or bare-root trees or shrubs in combinations that emulate the native species composition of the area. The planted area will be no more than one acre in size, such that quantities of trees and shrubs are small and bulk pricing does not apply. This scenario includes tree/shrub components representative of small-area pricing; other trees and/or shrubs sizes/ages may be substituted. Resource concerns include: Plant productivity and health, Plant structure and composition, Sediment transported to surface water, Nutrients transported to surface water, Elevated water temperature, Pesticides transported to surface water, Pathogens and chemicals from manure, biosolids, or compost applications transported to surface water, Bank erosion from streams, shorelines, or water conveyance channels, Terrestrial habitat for wildlife and invertebrates, Aquatic habitat for fish and other organisms.

Before Situation:

Typical settings include degraded or converted riparian forests, and nonforest conditions with undesirable amounts or types of vegetation. Active bank erosion is contributing sediment, nutrients, pesticides, pathogens, chemicals, or organics into surface

After Situation:

A riparian buffer of trees and shrubs has been restored and is functioning properly to provide stability, filtration, shade, and desirable habitat to address identified resource concerns.

Feature Measure: Area of planting

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $3,178.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,178.73

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 391 - Riparian Forest Buffer

Scenario: #49 - Small area hand planting with container or bare root stock, with tree shelters

Scenario Description:

Establish a small (<1 ac) buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and provide conservation benefits. The buffer will be located adjacent to a watercourse or waterbody and designed with dimensions and plant spacings that fully implement the practice. The planting will consist of hand-planted containerized or bare-root trees or shrubs in combinations that emulate the native species composition of the area. Tree shelters will be placed on all trees and/or shrubs. The planted area will be no more than one acre in size, such that quantities of trees and shrubs are small and bulk pricing does not apply. This scenario includes tree/shrub components representative of small-area pricing; other trees and/or shrubs sizes/ages may be substituted. Resource concerns include: Plant productivity and health, Plant structure and composition, Sediment transported to surface water, Nutrients transported to surface water, Elevated water temperature, Pesticides transported to surface water, Pathogens and chemicals from manure, biosolids, or compost applications transported to surface water, Bank erosion from streams, shorelines, or water conveyance channels, Terrestrial habitat for wildlife and invertebrates, Aquatic habitat for fish and other organisms.

Before Situation:

Typical settings include degraded or converted riparian forests, and nonforest conditions with undesirable amounts or types of vegetation. Active bank erosion is contributing sediment, nutrients, pesticides, pathogens, chemicals, or organics into surface

After Situation:

A riparian buffer of trees and shrubs has been restored and is functioning properly to provide stability, filtration, shade, and desirable habitat to address identified resource concerns.

Feature Measure: Area of planting

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $5,600.91

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,600.91

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 393 - Filter Strip

Scenario: #5 - Native Species

Scenario Description:
A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of native species.

Before Situation:
Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring

After Situation:
The 393 Implementation Requirements are developed for the site and applied. The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of native species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and seed. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas.

Feature Measure: number of acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $332.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $332.67

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 393 - Filter Strip

Scenario: #6 - Introduced Species

Scenario Description:

A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of introduced species.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring

After Situation:

The 393 Implementation Requirements are developed for the site and applied. The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and seed. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas.

Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $243.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $243.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 393 - Filter Strip

Scenario: #16 - Native Species, Foregone Income

Scenario Description:

A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of native species. The area of the filter strip is taken out of production.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring

After Situation:

The 393 Implementation Requirements are developed for the site and applied. The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of native species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and seed. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on the contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Feature Measure: number of acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $728.93

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $728.93

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 393 - Filter Strip

Scenario: #17 - Introduced Species, Foregone Income

Scenario Description:

A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of introduced species. The area of the filter strip is taken out of production.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring

After Situation:

The 393 Implementation Requirements are developed for the site and applied. The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and seed. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $639.49

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $639.49

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 394 - Firebreak

Scenario: #1 - Bare Soil, Disked

Scenario Description:

Installation of a bare-ground firebreak of a minimum width of 20' around a 20 acre field/farm using farm equipment. Generally water control devices such as water bars are not needed due either to the lack of steep terrain or the temporary nature of the firebreak. This practice is typically implemented to control fire during a prescribed burn of a field with shrubs and/or warm season grasses managed for wildlife. Resource concerns include Wildfire hazard from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, and Habitat degradation.

Before Situation:

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Installation will be accomplished by making two passes with the use of typical farm equipment such as tractors, plows, disks, or similar

After Situation:

Associated Practices: 338-Prescribed Burning; 383-Fuelbreak; 643- Restoration and Management of Declining Habitats; 645-Upland Habitat Development and Management; 647-Early Successional Habitat

Feature Measure: Length of firebreak

Scenario Unit: Foot

Scenario Typical Size: 5,000.0

Scenario Total Cost: $736.71

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.15

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 394 - Firebreak

Scenario: #2 - Bare Soil, Less Than or Equal to 15 Percent Slope

Scenario Description:

Use of medium equipment such as small dozers to blade, disk, plow, etc. bare-soil firebreaks on slopes less than 15%. Generally, water control devices such as water bars are limited to 10 or less per 1,000 feet when properly planned and installed using the same equipment. Resource concerns include Wildfire hazards from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, and Habitat degradation.

Before Situation:

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Conditions such as topography, the presence of brush and trees, etc. make the use of typical farm equipment impractical.

After Situation:

The property is adequately protected from wildfire or can be safely prescribe burned and the potential for excessive erosion from the firebreak is negligible.

Feature Measure: Length of firebreak

Scenario Unit: Foot

Scenario Typical Size: 3,000.0

Scenario Total Cost: $2,363.08

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.79

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 394 - Firebreak

Scenario: #3 - Bare Soil, Greater Than or Equal to 15 Percent Slope

Scenario Description:

Use of equipment such as small dozers to blade bare-soil firebreaks on slopes equal to or greater than 15%. Water control devices such as water bars placed at approximately 15 to 25 per 1,000 ft section of firebreak, are necessary to control erosion. These will be installed with the same equipment. Resource concerns include Wildfire hazard from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, Habitat degradation, Soil erosion, and Excessive sediment in surface waters.

Before Situation:

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Conditions such as topography, the presence of brush and trees, etc. make the use of typical farm equipment impractical. As slopes incre

After Situation:

The property is adequately protected from wildfire or can be safely prescribe burned and the potential for excessive erosion from the firebreak is minimized.

Feature Measure: Length of firebreak

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $2,279.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.28

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 394 - Firebreak

Scenario: #4 - Permanent Vegetation, 20 Feet

Scenario Description:

Establishing a 20 foot wide strip of permanent vegetation that will serve as a green firebreak. Scenario includes clearing the site, preparing the seedbed, seeding (typically cool season grasses and/or legumes), and applying needed soil amendments. Clearing will be achieved with the use of a bush hog or similar equipment. Seedbed preparation and vegetation establishment will be accomplished with farm equipment. Soil amendments will be applied according to local FOTG guidance. This scenario does not include follow-up maintenance operations such as weed control. mowing, etc. Resource concerns include Wildfire hazard from excessive biomass accumulation, Soil erosion, and Excessive sediment in surface waters.

Before Situation:

Firebreak installed in the fall prior to scheduled spring prescribed burn to control fire. Green firebreak established by planting clover and winter wheat. Soil amendments applied at seeding.

After Situation:

The property is adequately protected from wildfire or can be safely prescribe burned. Wildlife habitat will also be enhanced and the potential for erosion from the firebreak is minimized.

Feature Measure: Length of firebreak

Scenario Unit: Foot

Scenario Typical Size: 5,000.0

Scenario Total Cost: $937.90

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.19

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 394 - Firebreak

Scenario: #6 - Fire Plow

Scenario Description:

Practice is installed to facilitate a prescribed burn which will help maintain or enhance habitat (cover, shelter and forage) as well as connecting fragmented habitats. This practice scenario will be implemented to enhance plant condition by improving productivity, health and vigor of desired tree species. Habitat quality will also be improved as a result of reducing the stocking density of plants in the understory by and enabling regeneration of ground level vegetation

Before Situation:

A stand of forestland age 12-40+ with prescribed burning planned. Some border or property line firebreaks exist but additional firebreaks are needed to facilitate planned

After Situation:

After Practice Implementation: Firebreaks are installed by a contractor using a bulldozer/Fireplow and push blade to clear flammable debris and vegetation along the planned location. Raking and hand work is used to tie bladed firebreaks into streams, wetlands and other sensitive areas. Planned firebreaks are installed according design bladed width. Associated Practices: 338-Prescribed Burning; 383-Fuelbreak; 643- Restoration and Management of Declining Habitats; 645-Upland Habitat Development and Management; 647-Early Successional Habitat

Feature Measure: Length of feet

Scenario Unit: Foot

Scenario Typical Size: 5,000.0

Scenario Total Cost: $1,917.96

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #1 - Riparian Zone, Forested

Scenario Description:

This scenario describes fish and wildlife habitat improvement and/or management actions focused on the community structure and function of forested riparian zone plant communities. The planned activity meets the 395 standard, and facilitating practice standards, especially Codes 390 and 391, utilized in combination to satisfy all requirements specific to habitats needed for the stream and riparian species for which the practice is being implemented. Implementation will improve instream and riparian habitat complexity, water quality, hiding and resting cover, and/or increased food availability for desired riparian and stream species. Because species and habitats differ dramatically within and across regions and/or MLRAs, up to 12 riparian plant community-specific scenarios may be required across the US.

Before Situation:

Riparian quality and quantity are at risk as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 for those elements. The site does not have adequate food, cover, and/or connectivity for riparian wildlife, and contributes insuffic

After Situation:

Revegetation/reforestation of the riparian zone is completed and the vegetation community is under close management to insure long-term survival and ecological succession of the plant community. The quality and quantity of the riparian zone components of the site are managed to support a diverse vegetation community suitable for the site, the species that depend on it for habitat, and the functions it performs or will eventually perform as the vegetation matures. These functions include: stream temperature moderation thru shading, recruitment of instream large wood and/or non-woody organic matter, riparian habitat for terrestrial insects and other riparian-dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $21,028.15

Total Cost per Unit: $10,514.07

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #2 - Wood Structure, Root Wads, Instream

Scenario Description:

This scenario involves placement of large wood (logs, root wads, log structures) into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components lacking for aquatic species (i.e. large wood, pools). A project design for wood placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large wood and root wads placed into the stream will mimic genus, age, and size of mature trees found in intact, reference riparian areas in the MLRA where the project is located. Large wood/trees with rootwads intact should be placed in streams to create pool habitat according to NRCS engineering specifications and with close review & approval of a fish habitat biologist. Boulders placed to provide ballast shall only be used if the geomorphic setting and project design demand this component. The planned activity will meet the current 395 standard, and facilitating practice standards utilized, including timing of work windows required for protected aquatic and riparian species, and protecting/restoring vegetation and substrates of/to areas impacted by heavy equipment. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Monitoring records demonstrating implementation of this scenario will address resource concerns for stream species of concern are required.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat c

After Situation:

Stream habitat within the project reach is improving as a result of placing logs, root wads, and/or wood structures in the channel and/or along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

Feature Measure: Bankfull width x reach lengt

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $22,334.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $22,334.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #3 - Rock Structure, Boulders Instream

Scenario Description:

This scenario describes the implementation of a stream habitat improvement and management project that places individual boulders or boulder clusters, or rock structures in or adjacent to the stream channel as habitat components. A project design for boulder placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Boulders should be placed in streams to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologist onsite during implementation of the project design. Spawning gravel placement should be placed to restore spawning area substrates potentially disturbed by rock placement. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, spawning habitat, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of stream habitat assessment, and project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat conn

After Situation:

Stream habitat within the project reach is improving as a result of placing boulders or constructing rock structures in the channel and/or along the stream bank. Hydraulic complexity of the habitat in the reach is increased, and hiding cover, food availability and refuge habitat for stream species is improving. Streambank vegetation is increasing and contributing to stability of the streambanks.

Feature Measure: Bankfull width x reach lengt

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $22,286.75

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $22,286.75

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #4 - Rock and Wood Structure

Scenario Description:

This scenario describes the implementation of a stream habitat improvement and management project where practices are focused on instream habitat improvement with a combination of rock AND wood structures. This scenario involves placement of large wood and rock structures into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components (such as large wood, pools) are not currently present in the stream or are limited for aquatic species. A project design for placement of habitat structures (boulders, boulder clusters, wood, wood structures) will be based on assessment of (a) the target stream reach characteristics and (b) those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Rock boulder sizes should also reflect the geomorphic setting of the stream reach. Large wood placed into the stream under this scenario should be similar in species, age, and size (diameter) as trees found in the surrounding riparian area, to the extent possible. Wood, boulders and/or boulder clusters will be placed in the stream to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologist onsite during the planning and implementation of the project. This scenario involves restoring one acre of stream. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5. The site does not have adequate food, cover, and perhaps habitat connectiv

After Situation:

Stream habitat within the project reach is improving as a result of placing logs, rocks, or constructing wood and rock structures in the channel and/or along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

Feature Measure: stream length X bank full wi

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $39,059.11

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $39,059.11

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #33 - Berm Removal

Scenario Description:

This scenario describes fish and wildlife habitat improvement and/or management actions focused on the community structure and function of forest riparian zone communities. Historic large floods deposited massive amounts of boulder, cobble, and gravel streambed material onto agricultural floodplains. These floods also created obstructions in the channel consisting of accumulated streambed material which in some cases aggraded all the way to the tops of the banks and created avulsions. Flood recovery efforts involved pushing the alluvial material from the channel and floodplain to the top of the stream bank where it was shaped into berms. These berms have altered the stream hydrology by not allowing the stream to access the floodplain and have altered the near bank topography and soil composition thereby degrading the stream and riparian zone. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat Degradation; SOIL EROSION - Excessive bank erosion from streams shorelines or water conveyance channels. Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. -- Site preparation and Reclamation associated with project footprint: (382) Fence. -- Reach Planning/Habitat Enhancement: (327) Conservation Cover, (342) Critical Area Planting, (390) Riparian Herbaceous Cover), (391) Riparian Forest Buffer, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, (584) Channel Bed Stabilization, (612) Tree Shrub Establishment

Before Situation:

Riparian quality and quantity are at risk as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 for those elements, particularly the Hydrologic Alteration Element 2. Mounds of boulders, cobbles, gravels and fines line the stream

After Situation:

Access to the floodplain is reestablished and the reclaimed area at the top of streambanks is planted with a diverse vegetated community. The berm material is relocated outside of the floodplain. The material is spread, seeded, and mulched. The quality and quantity of the riparian zone components of the site are managed to support a diverse vegetation community suitable for the site, the species that depend on it for habitat, and the functions it performs or will eventually perform as the vegetation matures. These functions include: stream temperature moderation through shading, recruitment of instream large wood and/or non-woody organic matter, riparian habitat, streambank integrity, and filtration of contaminants from surface runoff into the stream. A trapezoidal berm 1000' long , 12' wide on the bottom, 4' wide on the top, with a height of 8' for a total of 2370 CY with vegetation growing intermittently throughout was used for estimation purposes. The berm material is hauled out of the floodplain to an approved location.

Feature Measure: volume of berm removal

Scenario Unit: Cubic Yard

Scenario Typical Size: 2,370.0

Scenario Total Cost: $28,608.34

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12.07

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 396 - Aquatic Organism Passage

Scenario: #1 - Removal, Concrete Dam

Scenario Description:

Full or partial removal of a concrete dam to restore aquatic organism passage, improve water quality, and promote functional river ecology and geomorphology. The extent of removal (full or partial) is determined through consultations with the dam owner in consideration of prevailing regulations and site historical status. Adjacent floodplain surfaces above and below the target dam are considered in the planning process to account for shifts in streamflow and geomorphic regime. Resulting channel dimensions and profile are determined on a site-specific basis to reflect--to the fullest extent possible--pre-dam conditions. A hydraulic analysis of the up and downstream impacts including potential loss of flood protection, irrigation, recreation, etc. must be completed and approved with the associated state and or federal requirements, environmental impact statement. Even though the structure is on private property state and federal regulations must be followed and signed off by a PE. Pre-removal sediment assays are completed to determine the toxicity of sediment stored behind the dam. Planning for the reclamation and management of stored sediments is completed according to geomorphic conditions, prevailing regulations, and the results of sediment toxicity investigations. Removal is done with an assortment of equipment, including tracked excavators outfitted with hydraulic chisels, hammers and/or buckets with "thumbs", bull dozers, skid steers, cranes, front-end loaders, and dump trucks. Alternative demolition techniques may include the use of high explosives, diamond-chain, or similar circular saws to remove the dam in a piecewise manner. Removed materials are trucked away and disposed or recycled off-site. Disturbed areas are revegetated using Critical Area Planting (342). Scenario does not include additional measures needed in the active channel and floodplain to account for post-removal changes to stream plan, pattern, or profile, or reclamation of any former impounded areas. Additional structural measures may be necessary to address constructed features associated with the removed dam including canals, raceways, adjacent spillways, navigation locks, access and maintenance roads, or similar civil works. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature. Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

A channel-spanning concrete dam no longer has functional use, may be failing, or creates a hazard to downstream capital infrastructure or communities. The dam blocks upstream aquatic organism migration, and downstream migrants may be diverted into hydraul

After Situation:

The existing dam is removed and reach geometry and slope are restored to pre-dam conditions to the fullest extent practicable. Aquatic organism passage and river ecology and geomorphic conditions are restored to pre-dam conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

Feature Measure: Cubic Yards of concrete in d

Scenario Unit: Cubic Yard

Scenario Typical Size: 250.0

Scenario Total Cost: $187,238.49

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $748.95

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 396 - Aquatic Organism Passage

Scenario: #2 - Removal, Earthen Dam

Scenario Description:

Full removal of an earthen dam to restore aquatic organism passage, improve water quality, and promote functional river ecology and geomorphology. The removal extent is determined through consultations with the dam owner in consideration of prevailing regulations and site historical status. Adjacent floodplain surfaces above and below the target dam are considered in the planning process to account for shifts in streamflow and geomorphic regime. Resulting channel dimensions and profile are determined on a site-specific basis to reflect, to the fullest extent possible, pre-dam conditions. A hydraulic analysis of the up and downstream impacts including potential loss of flood protection, irrigation, recreation, etc. must be completed and approved with the associated state and or federal requirements, environmental impact statement. Even though the structure is on private property state and federal regulations must be followed and signed off by a PE. Pre-removal sediment assays are be completed as necessary to determine the toxicity of sediment stored behind the dam. Planning for the reclamation and management of stored sediments is completed according to geomorphic conditions, prevailing regulations, and the results of sediment toxicity investigations. Removal is done with an assortment of equipment, including tracked excavators outfitted with hydraulic chisels, hammers and/or buckets with "thumbs", bull dozers, skid steers, cranes, front-end loaders, and dump trucks. Removed materials are trucked away and disposed or recycled off-site, unless native streambed material found in the embankment can be used in site reclamation. Disturbed areas are revegetated using Critical Area Planting (342). Scenario does not include additional measures needed in the active channel and floodplain to account for post-removal changes to stream plan, pattern, or profile, or reclamation of any former impounded areas. Additional structural measures may be necessary to address constructed features associated with the removed dam including head gates, canals, raceways, access and maintenance roads, or similar civil works. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature. Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

A channel-spanning earthen dam no longer has functional use, may be failing, or creates a hazard to downstream capital infrastructure or communities. The dam blocks upstream aquatic organism migration, and downstream migrants may be diverted into hydrauli

After Situation:

The existing dam is removed and reach geometry and slope are restored to pre-dam conditions to the fullest extent practicable. Aquatic organism passage and river ecology and geomorphic conditions are restored to pre-dam conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

Feature Measure: Cubic Yards of earthen emb

Scenario Unit: Cubic Yard

Scenario Typical Size: 500.0

Scenario Total Cost: $125,143.32

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $250.29

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 396 - Aquatic Organism Passage

Scenario: #3 - Removal, Passage Barriers

Scenario Description:

Removal of passage barriers, including small relict earthen diversions (e.g., splash dams), failing or undersized culverts, and sediment or large woody material (>10cm diameter and 2m length) from mass wasting or major flood events. Instream material associated with the previously mentioned circumstances or structures prevents aquatic organism passage by the creation of channel-spanning blockages, or areas of shallow depth, high velocities, or extensive changes in water surface elevation. In addition, these features may encourage abrupt channel changes that endanger adjacent capital infrastructure or transportation corridors. Excessive streambank erosion by flows deflected around or impounded behind these features may impair water quality by introducing fine sediment out of phase with the natural hydrograph and the life history requirements of native aquatic species. A hydraulic analysis of the up and downstream impacts including potential loss of flood protection, irrigation, recreation, etc. must be completed and approved with the associated state and or federal requirements, environmental impact statement. Even though the structure is on private property state and federal regulations must be followed and signed off by a PE. Removal is done with an assortment of equipment, including tracked excavators outfitted with buckets with "thumbs", bull dozers, skid steers, front-end loaders, and dump trucks. The channel and adjacent floodplain are restored to pre-blockage conditions to the fullest extent practicable. Removed materials are trucked away and disposed or recycled off-site, unless native streambed material found in the blockage can be used in site reclamation. Large woody material, if present, is used for instream reclamation, replaced in the channel downstream of the blockage, or trucked offsite for disposal or stockpiling for future projects. Disturbed areas are revegetated using Critical Area Planting (342). Scenario does not include additional measures needed in the active channel and floodplain. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; (643) Restoration and Management of Rare and Declining Habitats. ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An instream feature spanning the active channel creates hydraulic conditions that exceed the swimming or crawling abilities of native aquatic organisms. Event-driven mass wasting or instream deposits of coarse sediment create channel blockages or areas of

After Situation:

The instream barrier is removed by a combination of methods and equipment and the channel and affected floodplain are restored to pre-blockage conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

Feature Measure: Cubic Yards of mineral sedi

Scenario Unit: Cubic Yard

Scenario Typical Size: 200.0

Scenario Total Cost: $31,227.01

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $156.14

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 396 - Aquatic Organism Passage

Scenario: #4 - Fishway, Nature-Like

Scenario Description:

Nature-like fishways, also known as roughened channels, rock ramps, or bypass channels, are constructed features that provide passage around an instream barrier or in place of a removed barrier. Fishway design is based on simulating or mimicking adjacent stream characteristics, using natural materials, and providing suitable passage conditions over a range of flows for a wide variety of fish species and other aquatic organisms. Nature-like fishways provide enhanced passage conditions compared to concrete or aluminum (Alaskan Steeppass) ladders, and are not as susceptible to debris-related operational issues. When used to bypass an instream barrier, they require a larger footprint than instream structures, and may also require control structures to regulate flow through the fishway or address tailwater fluctuations affecting the fishway entrance (downstream end). Fishway design includes an assessment of adjacent stream characteristics, including channel geometry, slope, sediment texture and composition, and major geomorphic units that govern channel plan, pattern and profile. In the case of a fishway that bypasses an instream barrier, the design is tailored to these elements, the elevation required to ascend the barrier, and the known range of flow variation or operations. For fishways constructed in the place of a removed barrier, the design may be a hybrid approach that meets the same criteria, although in a smaller instream footprint. Nature-like fishways are constructed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Large woody material is used to create channel structural elements in some settings, when available and where approved by oversight agencies. Removed materials are trucked away and disposed or recycled off-site, unless excavated native streambed material can be used in fishway construction. Large woody material or removed trees, if present, are used for fishway construction trucked offsite for disposal, or trucked offsite for stockpiling for future projects. Disturbed areas are revegetated using Critical Area Planting (342) and access control and signage are provided. Scenario does not include additional measures needed in the active channel and floodplain or at an existing dam necessary to control flow associated with nature-like fishway. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

An instream barrier prevents upstream migration of native aquatic organisms and no support exists for removal. Similarly, an instream barrier is removed, and interested parties require maintenance of an upstream pool or pond. The subject stream contains a

After Situation:

A nature-like fishway is constructed in place of a removed barrier or around an existing barrier. The fishway is designed to mimic the adjacent natural stream, and is constructed of rock and/or large woody material that provides quality passage conditions for a number of species and geomorphic stability over a range of flows. Resource Concerns are addressed within the context of the site.

Feature Measure: Length of Fishway

Scenario Unit: Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $393,174.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $196.59

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 396 - Aquatic Organism Passage

Scenario: #5 - Culvert, Corrugated Metal Pipe

Scenario Description:

A corrugated metal (galvanized steel or aluminum) pipe culvert (CMP) of any shape (round, elliptical, or squash) used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. CMPs used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, CMPs used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The first estimate of culvert size--diameter or span--is obtained by analyzing bank full channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bank full investigations are begun at least 10-20 estimated bank full channel widths above the existing stream crossing. Culvert diameter or span is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Once the CMP diameter or span is determined, culvert length will be determined by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wingwalls may be necessary in shorter installations and/or where fill/roadway cover is limited or the stream alignment is not perpendicular to the road axis. Culvert wall thickness and corrugations are determined by road loading requirements. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross-sectional shape, substrate composition and arrangement, and bank shape and composition are determined. CMPs are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. . Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. The culvert is placed within the roadway on a sub excavated compacted bed, set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. Backfill depths are typically at least 20% of the culvert diameter or rise, but may deviate based on the shape of the culvert used, channel dimensions, substrate size, and the site longitudinal profile. Special equipment such as motorized wheelbarrows may be necessary to backfill smaller CMPs. Once the simulated streambed in the culvert barrel is complete, the roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated using Critical Area Planting (342). Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert as contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting

After Situation:

The undersized culvert is replaced with a CMP sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

Feature Measure: CMP

Scenario Unit: Foot

Scenario Typical Size: 40.0

Scenario Total Cost:	$40,743.76	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$1,018.59	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 396 - Aquatic Organism Passage

Scenario: #6 - Culvert, Stream Simulation with Headwall

Scenario Description:

A multi-plate galvanized steel or aluminum culvert (arch or box) used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. They commonly attach to preformed reinforced or poured-in-place concrete footings. Bottomless culverts used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, bottomless culverts used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The first estimate of culvert span is obtained by analyzing bank full channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bank full investigations are begun at least 10-20 estimated bank full channel widths above the existing stream crossing. Culvert span is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Once the culvert span is determined, culvert length will be dictated by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wingwalls may be necessary in shorter installations and/or where fill/roadway cover is limited or the stream alignment is not perpendicular to the road axis. Culvert wall thickness and footing requirements are determined by road loading requirements and site geotechnical investigations. Generally, the preferred footing is a T design with a spread footing with stem wall. Connecting the culvert leg to the footing can be done by welding, grouting, or bolting. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross sectional shape, substrate composition and arrangement, and bank shape and composition are determined. Bottomless arch or box culverts are commonly delivered in sections and bolted together in the field. Smaller arches can be delivered in one piece. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. Footings are placed or poured, and the new streambed is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. Once the simulated streambed between the footings is complete, the culvert sections are assembled and attached to the footings. Larger rock may be placed along the footing/culvert stemwall to protect the connection from damage by transported bedload. The roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated using Critical Area Planting (342). Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. Scenario does not include concrete for head or wingwalls.

Before Situation:

An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resultin

After Situation:

The undersized culvert is replaced with a bottomless arch or box culvert sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Typical size is 20' span (interior dimension) by 22.5' length with headwall. Aluminum headwalls are included with the installation which allows for a shorter installation length. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Feature Measure: Greatest of Span or Rise (ID)

Scenario Unit: Square Foot

Scenario Typical Size: 450.0

Scenario Total Cost:	$137,731.14	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$306.07	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 396 - Aquatic Organism Passage

Scenario: #7 - Culvert, Stream Simulation

Scenario Description:

A multi-plate galvanized steel or aluminum culvert (arch or box) used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. They commonly attach to preformed reinforced or poured-in-place concrete footings. Bottomless culverts used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, bottomless culverts used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The first estimate of culvert span is obtained by analyzing bank full channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bank full investigations are begun at least 10-20 estimated bank full channel widths above the existing stream crossing. Culvert span is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Once the culvert span is determined, culvert length will be dictated by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wingwalls are not included in this scenario. Culvert wall thickness and footing requirements are determined by road loading requirements and site geotechnical investigations. Generally, the preferred footing is a T-design with a spread footing with stem wall. Connecting the culvert leg to the footing can be done by welding, grouting, or bolting. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross-sectional shape, substrate composition and arrangement, and bank shape and composition are determined. Bottomless arch or box culverts are commonly delivered in sections and bolted together in the field. Smaller arches can be delivered in one piece. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. Footings are placed or poured, and the new streambed is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. Once the simulated streambed between the footings is complete, the culvert sections are assembled and attached to the footings. Larger rock may be placed along the footing/culvert stemwall to protect the connection from damage by transported bedload. The roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated using Critical Area Planting (342). Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. Scenario does not include concrete for head or wingwalls.

Before Situation:

An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resultin

After Situation:

The undersized culvert is replaced with a bottomless arch or box culvert sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Typical size is 15' span (interior dimension) by 40' length. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Feature Measure: Greatest of span or rise (int

Scenario Unit: Square Foot

Scenario Typical Size: 600.0

Scenario Total Cost:	$67,178.53	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$111.96	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 396 - Aquatic Organism Passage

Scenario: #8 - Culvert, Concrete Box

Scenario Description:

A four-sided precast concrete box (square or rectangular) culvert used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. Concrete box culverts are generally available in sections of 1-foot increments. Concrete box culverts used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, concrete box culverts used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The first estimate of culvert width is obtained by analyzing bank full channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bank full investigations are begun at least 10-20 estimated bank full channel widths above the existing stream crossing. Culvert width is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Once the culvert width is determined, culvert length will be determined by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wingwalls may be necessary in shorter installations and/or where fill/roadway cover is limited or the stream alignment is not perpendicular to the road axis. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross-sectional shape, substrate composition and arrangement, and bank shape and composition are determined. Concrete box culverts are delivered in sections and assembled onsite, and require adequate bed compaction throughout the crossing section. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. The new streambed is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. The roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated with Critical Area Planting (342). Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing.

Before Situation:

An existing undersized culvert as contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting

After Situation:

The undersized culvert is replaced with a concrete box culvert sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Typical size is 8' span (interior dimension) by 20' length. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Feature Measure: Greatest of span or rise (int

Scenario Unit: Square Foot

Scenario Typical Size: 160.0

Scenario Total Cost: $53,782.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $336.14

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 396 - Aquatic Organism Passage

Scenario: #9 - Bridge, Cast-In-Place Abutment

Scenario Description:

A channel-spanning structure that carries a road or trailway across a river or stream. Constructed of timber, I-beams, or concrete, bridges are attached at either end to prefabricated, reinforced and poured-in-place, or piling abutments capped/surrounded with concrete. Longer span bridges may require instream pilings to support the travel surface. Bridge decking can be timber, concrete, asphalt, or some combination thereof. Bridge design is completed to conform to loading requirements and site conditions. Geotechnical investigations are used to determine the best support structure suited to a given site. The bridge deck is designed to rest on abutments placed on the adjacent floodplain. Bridge components are delivered to the site and assembled by a combination of equipment and manual labor. They are installed with an assortment of equipment used for excavation, placing material, delivering and removing material, and lifting bridge components from delivery trucks onto the constructed bridge support elements. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert (if applicable), and topsoil conservation for site reclamation. Stream diversion is not necessary since the bridge will be constructed above the active channel. Disturbed areas are revegetated using Critical Area Planting (342). Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the bridge crossing.

Before Situation:

An existing stream crossing outfitted with an undersized culvert has a history of maintenance issues and failure. The downstream channel has experienced bed and bank scour, and the crossing may have to the deposition of a wedge of sediment upstream of the

After Situation:

The undersized culvert is replaced with a timber bridge placed on cast -in -place (CIP) concrete abutments. Typical size 30' span by 14' width. The bridge deck is composed of timber planks, and elevated, continuous railings run down each side connecting one abutment to its counterpart on the opposite bank. Signs on either approach indicate bridge capacity and weight restrictions. Because the bridge spans the active channel and sits atop the adjacent floodplain surface, geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Feature Measure: Area of bridge deck

Scenario Unit: Square Foot

Scenario Typical Size: 420.0

Scenario Total Cost: $97,449.44

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $232.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 396 - Aquatic Organism Passage

Scenario: #10 - Bridge, Precast Abutment

Scenario Description:

A channel-spanning structure that carries a road or trailway across a river or stream. Constructed of timber, I-beams, or concrete, bridges are attached at either end to prefabricated or precast concrete. Longer span bridges may require instream pilings to support the travel surface. Bridge decking can be timber, concrete, asphalt, or some combination thereof. Bridge design is completed to conform to loading requirements and site conditions. Geotechnical investigations are used to determine the best support structure suited to a given site. The bridge deck is designed to rest on abutments placed on the adjacent floodplain. Bridge components are delivered to the site and assembled by a combination of equipment and manual labor. They are installed with an assortment of equipment used for excavation, placing material, delivering and removing material, and lifting bridge components from delivery trucks onto the constructed bridge support elements. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert (if applicable), and topsoil conservation for site reclamation. Stream diversion is not necessary since the bridge will be constructed above the active channel. Disturbed areas are revegetated using Critical Area Planting (342). Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the bridge crossing.

Before Situation:

An existing stream crossing outfitted with an undersized culvert has a history of maintenance issues and failure. The downstream channel has experienced bed and bank scour, and the crossing may have to the deposition of a wedge of sediment upstream of the

After Situation:

The undersized culvert is replaced with a timber bridge placed on precast concrete abutments. Typical size is 30' span by 14' width. The bridge deck is composed of timber planks, and elevated, continuous railings run down each side connecting one abutment to its counterpart on the opposite bank. Signs on either approach indicate bridge capacity and weight restrictions. Because the bridge spans the active channel and sits atop the adjacent floodplain surface, geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Feature Measure: Area of bridge deck

Scenario Unit: Square Foot

Scenario Typical Size: 420.0

Scenario Total Cost: $82,288.93

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $195.93

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 396 - Aquatic Organism Passage

Scenario: #11 - Bridge, Prefabricated

Scenario Description:

A channel-spanning structure constructure from a manufactured concrete or steel bridge structure that has been certified by a PE that carries a road or trailway across a river or stream. Bridge design is completed to conform to loading requirements and site conditions. The bridge deck is designed to rest on abutments placed on the adjacent floodplain. Bridge components are delivered to the site and assembled by a combination of equipment and manual labor. They are installed with an assortment of equipment used for excavation, placing material, delivering and removing material, and lifting bridge components from delivery trucks onto the constructed bridge support elements. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert (if applicable), and topsoil conservation for site reclamation. Channel diversion or dewatering is required since an existing blockage will be removed for bridge construction. Disturbed areas are revegetated using Critical Area Planting (342). Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the bridge crossing.

Before Situation:

An existing undersized culvert creates an upstream passage blockage to fish and other aquatic organisms. The existing crossing does not meet State or Federal fish passage guidance. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degra

After Situation:

The undersized culvert is replaced with a manufactured bridge placed on precast concrete abutments. Typical size is 30' span by14' width. The bridge deck is composed of concrete or steel and elevated, continuous railings run down each side connecting one abutment to its counterpart on the opposite bank. Signs on either approach indicate bridge capacity and weight restrictions. Because the bridge spans the active channel and sits atop the adjacent floodplain surface, geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. Resource Concerns are addressed within the context of the site. Associated Practices: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; (395) Stream Habitat Improvement and Management, (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection. Use (578) Stream Crossing when the primary intent is not a biological concern, but hydrologic or for moving animals, vehicles or humans across or fording stream.

Feature Measure: Area of bridge deck

Scenario Unit: Square Foot

Scenario Typical Size: 420.0

Scenario Total Cost: $91,166.64

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $217.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 396 - Aquatic Organism Passage

Scenario: #12 - Ladder, Concrete

Scenario Description:

Formed, reinforced, poured-in-place concrete structures outfitted with baffles (Denil), vertical slots, pools and weirs, submerged orifices, chutes or some combination thereof to provide upstream passage for aquatic organisms over dams and other hydraulic structures. Although fish ladder designs vary according to target species and site conditions, they can generally be described as a three-sided concrete channel with integrated hydraulic features that provide a gradual elevation increase across some distance that allows aquatic organism to swim over a barrier--they convert the total barrier head elevation into passable increments. Concrete ladders are often constructed with resting pools and may have switchbacks. The primary water source for a concrete ladder comes from streamflow diverted into the ladder exit (upstream end) and since it is passed through the ladder to the river below, it is not a consumptive use. These ladders often require flow control and regulating devices (sometimes automated), gates, and may need auxiliary pumps to provide attraction flows at the ladder entrance (downstream end) or augment flow in the ladder. Gages above and below the dam are required to inform ladder operation. Trash racks are used at the upstream end to block debris from entering the ladder. Concrete ladders also require frequent maintenance, and flow through unautomated ladders may need to be adjusted manually when adjacent river conditions or dam operations change. Concrete ladder designs can be complex and require interactions between engineering and ecological sciences for successful implementation. For example, the ladder entrance is one of the most important elements of the structure, and placement of this entrance in the downstream reach is a function of site characteristics and aquatic organism biology. In addition, some aquatic animals will not swim through a submerged orifice, so use of pool-orifice ladders is not recommended. Partners associated with dam ownership and operation, regulatory agencies, and others are consulted and included in the design and construction process. Ladder designs account for run volume and timing, and the swimming capabilities of target species. Some ladders in highly visible areas are finished with masonry facades to blend the ladder to the site in the interest of aesthetics or to conform with historic appearances. Concrete ladders are constructed with equipment for excavation, placing material, and delivering and removing material. Lifts or booms are required to place concrete into forms. Because ladders are often attached to existing dams, personnel familiar with the dam structure are involved at all phases of the process to ensure that plans conform with site requirements. Bed and bank excavation are necessary to create the location for concrete ladders, so site isolation and sediment and erosion control measures are used. Disturbed areas are revegetated using Critical Area Planting (342) and access control and signage are provided. Scenario does not include additional measures in the adjacent active channel necessary to control flow, address channel elevation or stability, or encourage fish guidance into the concrete ladder. Scenario does not include structures used as counting stations or to trap and sample upstream migrants. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

An operational, low hazard class fixed crest concrete dam becomes the target of parties interested in providing fish passage. The dam presently blocks the upstream migration of a number of native aquatic organisms, and suitable spawning and rearing habita

After Situation:

A concrete pool and chute ladder outfitted with aluminum internal features and 2 turn/resting pool is installed. The ladder is attached to the face and abutment of the dam, and the entrance is located along the streambank where migrating aquatic organisms are likely to encounter it. The ladder passes the estimated run volume with minimal delays, and native aquatic animals are able to reach upstream spawning and rearing areas and successfully produce offspring that become part of the population. The ladder has an operating plan that stipulates actions and responsible parties for every month of the year. The ladder is fenced to control access and signage indicating its function and relevant warnings is provided at numerous locations. Resource Concerns are addressed within the context of the site.

Feature Measure: Barrier height (feet)

Scenario Unit: Foot

Scenario Typical Size: 20.0

Scenario Total Cost: $374,932.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $18,746.64

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 396 - Aquatic Organism Passage

Scenario: #15 - Crossing, Low Water

Scenario Description:

Structure installed on low volume or on unimproved roads at watercourse crossings. Primary use is to allow livestock and equipment access to other parcels of land or operational units. Low-water crossings provide safe and stable stream crossings that don't negatively impact water and ecological quality while remaining stable across a wide range of flows. Variations exist, but a common application consists of an improved or hardened ford located above a hydraulic control (e.g., bedrock outcropping, riffle, or step composed of coarse substrates). Properly designed and installed low water crossings provide aquatic organism passage (AOP), promote stream ecological and geomorphic function, remain stable over time, and can pass sediment and woody debris. Conservation planning and interaction with the landowner is vital to determine if existing crossings can be consolidated into fewer, more reliable locations. Characterizing a site according to its watershed position and geomorphic function will aid design decisions. Optimal AOP conditions are usually realized when the backfill is composed of a mixture that mimics bed material as evaluated from a reference reach adjacent to the crossing—preferably at least 10-20 estimated bank full channel widths above an existing crossing to avoid effects that alter channel geometry or bedform composition and spacing. Low water crossings are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Low water crossings provide the best mix of function and longevity when they are designed and built to conform to existing channel geometry and slope, constructed to match the shape of the existing channel, and oriented to cross the stream at a 90 degree angle. Crossing width, measured along the downstream axis, should not exceed 2X bank full width. Low water crossings are commonly constructed by over excavating the crossing section 6-12 inches below the existing streambed and backfilling the void with well-graded rock back to natural bed elevation. Geotextile lining may be required in some settings. Rock size and gradation is the smallest mix needed to remain stable under prevailing flow conditions—larger rock can endanger livestock and turbulence impairs passage. Sand or soil may be added into the mix to seal the section to ensure that the stream doesn't percolate into the crossing substrate. Smaller material increases bed diversity, chokes voids between bigger stones, and helps preserve passage quality. Smaller rock smaller (< 2 inches) at the finished surface may become lodged in livestock hooves. The road/trail surface of the crossing should be extended to an elevation that exceeds the known high water level on each side of the crossing. The downstream edge of the crossing should not produce a sharp drop in water surface to preserve AOP quality and discourage sediment deposition and debris accumulation. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated using Critical Area Planting (342). Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. Stream corridor fencing should be considered to control livestock access and preserve water and riparian quality. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

A small farming operation has a mixture of pastures, hay meadows, and crops that all require seasonal movement of equipment and livestock between parcels. Four unimproved stream crossings provide unreliable access across the property and require yearly ma

After Situation:

An improved ford is constructed by excavating the channel just upstream of the boulder/cobble hydraulic control. The cut is lined with geotextile to control seepage and subsurface flow, and backfilled up to the existing bed elevation with a well-graded mix of rock sized to mimic the material in the channel upstream of the crossing. The finished crossing surface is at grade with the up and downstream channel elevation, and no drop exists along the downstream edge. Approaches on either side of the crossing are extended up to the adjacent floodplain surface, and the finished instream portion of the ford matches the existing channel cross section. Approach slopes are shallow enough for expected equipment traffic, including towed combinations, and armored as needed with larger rock to protect against erosion that may occur when the floodplain is inundated. The crossing is fenced and gated to control livestock access and provide greater flexibility to the landowner's grazing needs. AOP is provided, and the crossing remains stable across a range of flow and sediment and debris transport events. Resource Concerns are addressed within the context of the site.

Feature Measure: Cubic Yard of Crossing Mate

Scenario Unit: Cubic Yard

Scenario Typical Size: 42.0

Scenario Total Cost:	$13,739.80	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$327.14	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 396 - Aquatic Organism Passage

Scenario: #16 - Weir, Step Pool

Scenario Description:

Step pool weirs are constructed features that provide passage around an instream barrier or in place of a removed barrier. Step Pool Weirs are constructed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Disturbed areas are revegetated using Critical Area Planting (342) and access control and signage are provided. Scenario does not include additional measures needed in the active channel and floodplain or at an existing dam necessary to control flow associated with nature-like fishway. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Associated Practices (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment, 580 Streambank and Shoreline Protection, (395) Stream Habitat Improvement and Management, (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control580 Streambank and Shoreline Protection. Use (578) Stream Crossing when the primary intent is not a biological concern, but hydrologic or for moving animals, vehicles or humans across or fording stream.

Before Situation:

An instream barrier prevents upstream migration of native aquatic organisms and no support exists for removal. Similarly, an instream barrier is removed, and interested parties require maintenance of an upstream pool or pond.

After Situation:

A step pool weir is constructed in place of a removed barrier. The step pool weir is constructed of rock that provides quality passage conditions for a number of species and geomorphic stability over a range of flows. Resource Concerns are addressed within the context of the site. The typical scenario is for a 35' wide channel 100 feet long with weirs every 10'.

Feature Measure: Cubic Yard of Material

Scenario Unit: Cubic Yard

Scenario Typical Size: 800.0

Scenario Total Cost: $181,920.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $227.40

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 410 - Grade Stabilization Structure

Scenario: #1 - Check Dams

Scenario Description:

Typical setting is on a 40-acre pasture/hayland field having a slope of 5 to 10 percent where ephemeral gullies have formed. Typical installation consists of stabilizing/regrading the gully and installing six check dams with a top width of 3', average height of 2.5', 19' length, and 2:1 side slopes, ; containing an average of 21 tons of rock for a total of 126 tons. The check dams are underlain with geotextile fabric. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

Before Situation:

The operator presently has erosion gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed vegetation of disturbed areas use Critical Area Planting (342).

Feature Measure: Tons of rock installed

Scenario Unit: Ton

Scenario Typical Size: 126.0

Scenario Total Cost: $15,483.06

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $122.88

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 410 - Grade Stabilization Structure

Scenario: #5 - Embankment, Soil Treatment

Scenario Description:

An earthen embankment dam with a principal spillway pipe where on site soils are not acceptable and require extra processing or hauling from off farm, distances greater than one mile. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, 90 feet of 10" pace, pipe with a canopy inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yard

Scenario Typical Size: 2,500.0

Scenario Total Cost: $29,626.05

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11.85

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 410 - Grade Stabilization Structure

Scenario: #6 - Pipe Drop, Plastic

Scenario Description:

A full flow pipe drop (i.e.: riser and barrel) grade stabilization structure designed and constructed using plastic pipe without anti-seep collars. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser weir length (Diameter x 3.14) in feet times the length of the pipe barrel in (feet). Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon 6 ft high 18" (1.5') PVC riser with a 40 ft long barrel (1.5' x 3.14 x 40' = 188 SF). Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

Feature Measure: Riser Weir Length x Barrel L

Scenario Unit: Square Foot

Scenario Typical Size: 188.0

Scenario Total Cost: $10,798.09

Total Cost per Unit: $57.44

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 410 - Grade Stabilization Structure

Scenario: #7 - Pipe Drop, Steel

Scenario Description:

A full flow pipe drop (i.e.: riser and barrel) grade stabilization structure designed and constructed with a metal anti-seep collar. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser weir length (Diameter x 3.14) in feet times the length of the pipe barrel in (feet). Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a smooth steel pipe drop structure with a 36", 12' tall riser and a 100' long 30" barrel (Riser Weir length x Barrel Length = 3ft x 3.14 x 30ft = 940). Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

Feature Measure: Riser Weir Length x Barrel L

Scenario Unit: Square Foot

Scenario Typical Size: 940.0

Scenario Total Cost: $19,411.45

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $20.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 410 - Grade Stabilization Structure

Scenario: #8 - Drop Structure, Weir

Scenario Description:

A Straight, semicircular, or Box Drop structure composed of metal or reinforced concrete used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a semicircular steel toe wall structure with a drop of 3ft and weir length of 30ft (90 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (i.e.: outlet apron elevation).Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Feet of Weir length times Dr

Scenario Unit: Square Foot

Scenario Typical Size: 90.0

Scenario Total Cost: $14,604.87

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $162.28

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 410 - Grade Stabilization Structure

Scenario: #9 - Rock Drop

Scenario Description:

A Straight Drop structure constructed of rock riprap held in place by galvanized wire, such as, gabion baskets, fence panels, or "sausage" baskets. These structures are used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a gabion wall structure with a drop of 3ft and weir length of 8ft (24 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (i.e.: outlet apron elevation).Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Feet of Weir length times Dr

Scenario Unit: Square Foot

Scenario Typical Size: 24.0

Scenario Total Cost: $5,302.65

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $220.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 410 - Grade Stabilization Structure

Scenario: #10 - Drop Structure, Panel Rock

Scenario Description:

A Straight Drop structure constructed of rock riprap held in place by galvanized wire "cattle" panels. These structures are used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a structure with a drop of 4ft and weir length of 8ft (32 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (i.e.: outlet apron elevation).Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Feet of Weir length times Dr

Scenario Unit: Square Foot

Scenario Typical Size: 32.0

Scenario Total Cost: $4,672.63

Total Cost per Unit: $146.02

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 410 - Grade Stabilization Structure

Scenario: #12 - Chute Structure

Scenario Description:

A chute structure consisting of rock riprap, pavers, concrete or any other durable material used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a 10' wide chute that has 2:1 side slopes and is 1' deep and consists of rock that is 20" thick, stone that is 6" thick, and geotextile. The chute drops 6' vertical on a 2:1 slope with a 3' flat inlet and a 6' flat outlet, therefore, the typical surface area of the project is 14.4' x 22' or 323 SqFt. The unit of payment measurement is defined as the Tons of Rock Riprap used to build the rock structure, including the chute, side slopes, entrance and exit sections. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Ton of Riprap

Scenario Unit: Ton

Scenario Typical Size: 33.0

Scenario Total Cost: $5,073.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $153.75

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 410 - Grade Stabilization Structure

Scenario: #13 - Pipe Inlet, Plastic or Corrugated Metal Pipe

Scenario Description:

A pipe inlet installed consisting of plastic or CMP that does not require any additional appurtenances such as headwalls or risers. The pipe inlet may be of any size, typically 12" and less than 18" and may require a face plate, which is included as a part of the structure. Payment rate is based on the length of the pipe in feet. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in swales that outlet into field borders or filter strips. Cost estimate is based upon 30 foot long, 12" PVC pipe with a faceplate. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

Feature Measure: Length of Pipe

Scenario Unit: Foot

Scenario Typical Size: 30.0

Scenario Total Cost: $2,145.04

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $71.50

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 410 - Grade Stabilization Structure

Scenario: #76 - Pipe, Less Than or Equal to 6 Inch

Scenario Description:

An earthen embankment dam with a principal spillway pipe of 6 inches or less. Assessment shows anti-seep collars or sand diaphragms are not required. To stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,000 cubic yards, and 80 feet of pipe 6" PVC pipe with a canopy inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yard

Scenario Typical Size: 2,000.0

Scenario Total Cost: $12,521.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 410 - Grade Stabilization Structure

Scenario: #78 - Pipe, 8 to 12 Inch

Scenario Description:

An earthen embankment dam with a principle spillway pipe between 8 and 12 inches, anti-seep collars or sand diaphragm, and excavated plunge pool basin. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, 90 feet of 10" pace, pipe with a canopy inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yard

Scenario Typical Size: 2,500.0

Scenario Total Cost: $19,174.80

Total Cost per Unit: $7.67

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 410 - Grade Stabilization Structure

Scenario: #79 - Pipe, Greater Than 12 Inch

Scenario Description:

An earthen embankment dam with a principle spillway pipe greater than 12 inches. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, smooth steel drop inlet principle spillway with a 7 ft riser and 90 ft barrel, and 82 Square feet of anti-seep collars. A rock lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yard

Scenario Typical Size: 2,500.0

Scenario Total Cost: $26,422.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $10.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 412 - Grassed Waterway

Scenario: #1 - GWW < 1000ft long

Scenario Description:

Typical practice is 500' long, 12' bottom, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a resu

After Situation:

Installed grassed waterway is 500' long, 12' bottom, 8:1 side slopes, 1.5' depth. The practice is installed using a dozer. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Foot

Scenario Typical Size: 18,000.0

Scenario Total Cost: $1,614.58

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 412 - Grassed Waterway

Scenario: #2 - GWW > 1,000ft long

Scenario Description:

Typical practice is 1,500' long, 12' bottom, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a resu

After Situation:

Installed grassed waterway is 1,500 ' long, 12' bottom, 8:1 side slopes, 1.5' depth. The practice is installed using a dozer. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Acre of Waterway

Scenario Unit: Acre

Scenario Typical Size: 1.3

Scenario Total Cost: $2,970.84

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,376.68

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 412 - Grassed Waterway

Scenario: #3 - GWW with geotextile or stone checks

Scenario Description:

Typical practice is 1,200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Fabric or stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. Fabric Checks are installed 18" deep with 12" laid over on the surface. (Alternatively, rock checks could be installed). This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a resu

After Situation:

Installed grassed waterway is 1,200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth. Fabric checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Fabric or stone checks are installed with small backhoe and labor. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Acre of Waterway

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $3,916.55

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,916.55

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 412 - Grassed Waterway

Scenario: #27 - Base Waterway

Scenario Description:

Typical practice is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a resu

After Situation:

Installed grassed waterway is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth. The practice is installed using a dozer. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Acre of Waterway

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $2,649.42

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,649.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 412 - Grassed Waterway

Scenario: #28 - With Checks

Scenario Description:

Typical practice is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Fabric or stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. Fabric Checks are installed 18" deep with 12" laid over on the surface. (Alternatively, rock checks could be installed). This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a resu

After Situation:

Installed grassed waterway is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth. Fabric checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Fabric or stone checks are installed with small backhoe and labor. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Acre of Waterway

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $4,023.70

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,023.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 420 - Wildlife Habitat Planting

Scenario: #194 - High Species Diversity on Fallow or Non-Cropland, no Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) by establishing herbaceous plants. This practice scenario applies to areas not in production (e.g. – fallow areas, forest understory, and non-cropped areas in and around crop fields). Control or suppression of a well-established existing stand of undesirable vegetation should have been completed prior to implementation of this practice scenario through successful implementation of other practice standards, including CPS 314 or CPS 315. This scenario, when appropriately installed, will address the inadequate wildlife habitat resource concern by planting a moderately diverse mix of seeds that is readily available for purchase from multiple vendors in combination with minor seed bed preparation. Seed is typically not available from traditional agricultural vendors and requires making a special order or ordering online. Other practices are planned and installed after planting to manage the habitat as needed.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and ma

After Situation:

Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. The area will provide the identified habitat requirements for target species and will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $3,518.25

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $703.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 420 - Wildlife Habitat Planting

Scenario: #195 - Specialized Habitat Requirements on Non-Cropland, no Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) by establishing herbaceous plants. This practice scenario applies to areas not in production (e.g. – fallow areas, forest understory, and non-cropped areas in and around crop fields). Control or suppression of a well-established existing stand of undesirable vegetation should have been completed prior to implementation of this practice scenario through successful implementation of other practice standards, including CPS 314 or CPS 315. This scenario, when appropriately installed, will address the inadequate wildlife habitat resource concern by planting a specialized and often diverse mix of seeds that is NOT readily available for purchase, in combination with minor seed bed preparation. Seed is not available from traditional agricultural vendors and requires making a special order. Cost of seed is high due to limited availability and plant materials selected are needed to meet specific habitat requirements or ecosystem functions. Other practices are planned and installed after planting to manage the habitat as needed.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and ma

After Situation:

Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. The area will provide the identified habitat requirements for target species and will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $7,690.18

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,538.04

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 420 - Wildlife Habitat Planting

Scenario: #196 - High Species Diversity on Cropland with Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) and changing use (annual crop to permanent vegetation) by establishing herbaceous plants. This practice scenario applies to cropland currently in production. The inadequate wildlife habitat resource concern is met by planting a moderately diverse mix of seeds that is readily available for purchase from multiple vendors in combination with minor seed bed preparation. Seed is typically not available from traditional agricultural vendors and requires making a special order or ordering online. Weed pressure is minimal due to current and past management. Control or suppression of existing undesirable vegetation is accomplished through a single herbicide treatment. Post-planting weed treatment, beyond normal practice maintenance if necessary, will be accomplished by applying additional practice standards as appropriate.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and ma

After Situation:

The land is no longer in crop production. Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $6,704.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,340.83

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 420 - Wildlife Habitat Planting

Scenario: #197 - Specialized Habitat Requirements on Cropland with Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) and changing use (annual crop to permanent vegetation) by establishing herbaceous plants. This practice scenario applies to cropland currently in production. The inadequate wildlife habitat resource concern is met by planting a specialized and often diverse mix of seeds that is NOT readily available for purchase, in combination with minor seed bed preparation. Seed is not available from traditional agricultural vendors and requires making a special order. Cost of seed is high due to limited availability and plant materials selected are needed to meet specific habitat requirements or ecosystem functions. Weed pressure is minimal due to current and past management. Control or suppression of existing undesirable vegetation is accomplished through a single herbicide treatment. Post-planting weed treatment, beyond normal practice maintenance if necessary, will be accomplished by applying additional practice standards as appropriate.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and ma

After Situation:

The land is no longer in crop production. Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $9,948.74

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,989.75

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 420 - Wildlife Habitat Planting

Scenario: #198 - Very Small Acreage (<.5 ac) Planting with Seedlings

Scenario Description:

This scenario is applicable to very small areas (typical size is ¼ acre) in need of wildlife habitat establishment by planting of potted plants, plugs, or similar non-seed plant materials. A wildlife habitat evaluation found the need to improve habitat by altering the current vegetative conditions (diversity, richness, structure or pattern). Potted herbaceous plants and/or shrubs are planted in 6' rows and a 4' spacing (1815 plants/acre) to facilitate access of the site with mechanical equipment (e.g., ATV, hand or riding mower) for weed control or other management after establishment. The site preparation requires treatment with broad spectrum herbicide to kill the existing vegetation. Then tillage, smoothing and firming of the soil is conducted prior to planting the plant materials.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and have the potential to meet or exceed the minimum criteria. Current conditions and management are insufficient to address identified limiti

After Situation:

The Wildlife Habitat Planting criteria have been successfully implemented. The site has been mechanically and chemically treated and planting has occurred. The area is adequately stocked with desired species and full coverage of permanent vegetation is expected. The vegetative cover will provide the desired habitat requirements for target wildlife. The site meets or exceeds planning criteria for inadequate wildlife habitat.

Feature Measure: sg ft planted (1/4 acre)

Scenario Unit: Square Foot

Scenario Typical Size: 10,890.0

Scenario Total Cost: $7,567.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 420 - Wildlife Habitat Planting

Scenario: #199 - Low Species Diversity on Non-Cropland, no Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) by establishing herbaceous plants. This practice scenario applies to areas not in production (e.g. – fallow areas, forest understory, and non-cropped areas in and around crop fields). Control or suppression of a well-established existing stand of undesirable vegetation should have been completed prior to implementation of this practice scenario through successful implementation of other practice standards, including CPS 314 or CPS 315. This scenario, when appropriately installed, will address the inadequate wildlife habitat resource concern by planting a low diversity, low cost mix of readily available seeds in combination with minor seed bed preparation. Other practices are planned and installed after planting to manage the habitat as needed.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and ma

After Situation:

Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. The area will provide the identified habitat requirements for target species and will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $1,790.40

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $358.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 420 - Wildlife Habitat Planting

Scenario: #200 - Low Species Diversity on Cropland with Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) and changing use (annual crop to permanent vegetation) by establishing herbaceous plants. This practice scenario applies to cropland currently in production. The inadequate wildlife habitat resource concern is met by planting a low diversity, low cost mix of readily available seeds in combination with minor seed bed preparation. Weed pressure is minimal due to current and past management. Control or suppression of existing undesirable vegetation is accomplished through a single herbicide treatment. Post-planting weed treatment, beyond normal practice maintenance if necessary, will be accomplished by applying additional practice standards as appropriate.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and ma

After Situation:

The land is no longer in crop production. Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $4,512.64

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $902.53

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 420 - Wildlife Habitat Planting

Scenario: #286 - Very Small Acreage (<.5 ac) Planting with Plugs

Scenario Description:

This scenario is applicable to small areas (typical size is ¼ acre) in need of wildlife habitat establishment by plugs, or similar non-seed plant materials. A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) by establishing small patches of native vegetation. Herbaceous plugs are planted in 18” x 18” staggered row spacing (43560 sqft per acre/2.25 sqft per plant = 19,360 plants/acre OR 4840 plants per ¼ acre). Seed bed preparation requires treatment with broad spectrum herbicide, tillage, smoothing and firming of the soil prior to planting materials. Participant will typically hire labor to assist with portions of implementation. Utilizing plugs/sprigs following plant bed preparation is needed to ensure successful establishment due to site restrictions.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria. The planner has determined that the planning unit has the potential to meet or exceed the minimum criteria. Current conditions and management

After Situation:

The Wildlife Habitat Planting criteria have been successfully implemented. The site has been mechanically and chemically treated and planting has occurred. The area is adequately stocked with desired species and full coverage of permanent vegetation is expected. The vegetative cover will provide the desired habitat requirements for target wildlife. The site meets or exceeds planning criteria for inadequate wildlife habitat.

Feature Measure: Area Planted

Scenario Unit: Square Foot

Scenario Typical Size: 10,890.0

Scenario Total Cost: $13,494.66

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.24

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 422 - Hedgerow Planting

Scenario: #1 - Wildlife, NWSGs and trees, hand plant trees, machine plant grass

Scenario Description:

Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat connectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants. Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A mix of 2 native warm season grasses adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated in the specification for the site. This scenario assumes approximate average width of 25 feet but may vary throughout. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence.

Before Situation:

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

After Situation:

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

Feature Measure: Square foot of planting

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 20.0

Scenario Total Cost: $956.36

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $47.82

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 422 - Hedgerow Planting

Scenario: #2 - Wildlife machine plant

Scenario Description:

This scenario is for machine planting of woody species. Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat connectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants. Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A mix of 2 native grasses adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated in the specification for the site. This scenario assumes approximate average width of 25 feet but may vary throughout. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence.

Before Situation:

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

After Situation:

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

Feature Measure: Square foot of planting

Scenario Unit: Square Foot

Scenario Typical Size: 20,000.0

Scenario Total Cost: $1,412.42

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.07

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 422 - Hedgerow Planting

Scenario: #3 - Wildlife cool season grass and trees, hand plant tree, machine plant grass

Scenario Description:

Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat connectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants. Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A native cool season grass adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated in the specification for the site. This scenario assumes approximate average width of 35 feet but may vary throughout. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence.

Before Situation:

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

After Situation:

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

Feature Measure: Planting Area

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 20.0

Scenario Total Cost: $956.36

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $47.82

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 430 - Irrigation Pipeline

Scenario: #1 - Buried Pipe Less Than or Equal to 2 Inch Diameter

Scenario Description:

Description: Below ground installation of main, submain, etc. PVC or PE pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 24-inch; Scenario- Install 1000 feet of 1.5-inch, Sch 40 PVC ASTM 1785 (0.52 #/ft) pipeline with appurtenances.. Pipeline installed below ground with a minimum of 2 feet of ground cover. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Pipe Length

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $4,443.08

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.44

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 430 - Irrigation Pipeline

Scenario: #2 - Buried Pipe Greater Than 2 Inch Diameter and Less Than 6 Inch Diameter

Scenario Description:

Description: Below ground installation of main, submain, etc. PVC or PE pipeline.. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 24-inch; Scenario: Install 1000 feet of 4-inch, Sch 40 PVC (2 #/ft) pipeline with appurtenances.. Pipeline installed below ground with a minimum of 2 feet of ground cover. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Pipe Length

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $9,332.58

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9.33

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 430 - Irrigation Pipeline

Scenario: #3 - Buried Pipe Greater Than or Equal to 6 Inch Diameter

Scenario Description:

Description: Below ground installation of main, submain, etc. PVC or PE pipeline.. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 24-inch. Scenario Install 1000 feet of 6-inch, Sch 40 PVC (3.6 #/ft) pipeline with appurtenances.. Pipeline installed below ground with a minimum of 2 feet of ground cover. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Pipe Length

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $14,618.54

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $14.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 430 - Irrigation Pipeline

Scenario: #4 - Surface HDPE

Scenario Description:

Description: Surface installation of HDPE (Iron Pipe Size & Tubing) pipeline. Typical size of pipe installed: 1-inch to 4-inch; Install 1000 feet of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.43 lb./ft Appurtenances include: couplings, fittings, anchors, tees, air vents, thrust blocks, gate valves, air release valves, drain valve, and pressure relief valve, etc. and are included in the cost of pipe material (additional 15% of pipe material quantity). Revegetation is not included. Appurtenances include: fittings, air vents, pressure relief valves, anchors, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe Cost of appurtenances does not include flow meters or backflow preventers. HDPE Pipeline with appurtenances, on the ground surface, next to fence line. Typical installation applies to soils with no special requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline leaking, too small for efficiency, needs replacement or supplement irrigation conveyance system.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Pipe Length

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $2,612.89

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.61

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 430 - Irrigation Pipeline

Scenario: #68 - PVC (Iron Pipe Size), less than or equal to 4 inch, Small Scale System

Scenario Description:

Below ground installation of PVC (Iron Pipe Size) pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 3-inch. Construct 260 feet of 3-inch, Class 125 (SDR-32.5), PVC pipeline with appurtenances, installed below ground with a minimum of 2 feet of ground cover. The unit is weight of pipe material in pounds. 260 feet of 3-inch, Class 125 (SDR-32.5) PVC pipe weighs 0.730 lb./ft, or a total of 189.8 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface &Subsurface; 447 - Irrigation and Drainage Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Length of Pipe

Scenario Unit: Linear Foot

Scenario Typical Size: 260.0

Scenario Total Cost: $2,729.08

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $10.50

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 430 - Irrigation Pipeline

Scenario: #93 - HDPE (Iron Pipe Size and Tubing), less than or equal to 2 inch, Small Scale

Scenario Description:

Below ground installation of HDPE (Iron Pipe Size &Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; and typical scenario size is 1-inch. Construct 260 feet of 1-inch, Class 130 (SDR 13.5), HDPE pipeline with appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is weight of pipe material in pounds. 260 feet of 1-inch, Class 130 (SDR-13.5), HDPE weighs 0.16 lb./ft, or a total of 42 pounds. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface &Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 42.0

Scenario Total Cost: $2,835.44

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $67.51

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 430 - Irrigation Pipeline

Scenario: #94 - Surface HDPE (Iron Pipe Size and Tubing), less than or equal to 2 inch, Small Scale

Scenario Description:

On-ground surface installation of HDPE (Iron Pipe Size &Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; and typical scenario size is 1-inch. Construct 260 feet of 1-inch, Class 130 (SDR 13.5), HDPE pipeline with appurtenances. The unit is weight of pipe material in pounds. 260 feet of 1-inch, Class 130 (SDR-13.5), HDPE weighs 0.16 lb./ft, or a total of 42 pounds. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface &Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 42.0

Scenario Total Cost: $492.46

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11.73

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 436 - Irrigation Reservoir

Scenario: #1 - Embankment Dam with On-Site Borrow

Scenario Description:

The reservoir, created by an embankment built across a natural depression, with an 18" diameter principal spillway outlet through the embankment, is controlled by a canal-style gate. Outlet can also serve as overflow protection with a 12" diameter standpipe and tee to the 18" pipe. Any watershed runoff will be diverted around reservoir. It will be built with approximately 4,500 cubic yards of on-site material. It will be about 19.9 feet high and 200 feet long and hold approximately 1,000,000 gallons (3 acre-feet). The top of berm will be 10 feet wide and the embankment side slopes will be 2.5 H to 1 V up and down stream. Resource concern: Insufficient Water - Inefficient use of irrigation water. Associated practices include: 521 - Pond Sealing or Lining (various); 320 - Irrigation Canal or Lateral; 430 - Irrigation Pipeline; 428 - Irrigation Ditch Lining; 533 - Pumping Plant; 440 series - Irrigation Systems; 378 - Pond; 447 - Irrigation System, Tailwater Recovery; 484 - Mulching; and 342 - Critical Area Planting.

Before Situation:

Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient water application. Divert water around - no spillway

After Situation:

This is an embankment, installed across a natural off-stream intermittent watercourse, used to store water for subsequent irrigation. It will be used to accumulate and store water for timely and efficient application of water through an irrigation system The water source could be a well, irrigation district pipeline, and/or a pump from a stream. It is designed to deliver water by gravity to an open ditch or non-pressurized pipeline, generally in excess of 5 cfs. All earthen materials will be from on-site sources.

Feature Measure: Volume of Compacted Eartfi

Scenario Unit: Cubic Yard

Scenario Typical Size: 4,500.0

Scenario Total Cost: $27,431.50

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.10

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 436 - Irrigation Reservoir

Scenario: #7 - Plastic Tank 2,000 - 4,000 gallons

Scenario Description:

A 3,000 Gallon, above-ground, High Density Polyethylene plastic enclosed tank, is installed on 6" of well-compacted drain rock or a 4" thick reinforced concrete support pad, to store water from a reliable source for irrigation of an area less than one acre. The scenario assumes the typical dimensions of the tank are 102" in diameter and 93" tall. The scenario also assumes a 126" diameter gravel base or concrete pad to extend a minimum of 12" past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, or connecting fittings. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

Before Situation:

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

After Situation:

An above-ground plastic tank, constructed to withstand the elements, is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a large roof area, a water ram , or a pump drawing water from a stream.

Feature Measure: Volume of Tank Storage

Scenario Unit: Gallon

Scenario Typical Size: 3,000.0

Scenario Total Cost: $6,058.14

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 436 - Irrigation Reservoir

Scenario: #16 - Plastic Tank < 2000 gallons

Scenario Description:

A 1,200Gallon, above-ground, High Density Polyethylene plastic enclosed tank, is installed on 6" of well-compacted drain rock or a 4" thick reinforced concrete support pad, to store water from a reliable source for irrigation of an area less than one acre. The scenario assumes the typical dimensions of the tank are 102" in diameter and 93" tall. The scenario also assumes a 126" diameter gravel base or concrete pad to extend a minimum of 12" past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, or connecting fittings. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

Before Situation:

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

After Situation:

An above-ground plastic tank, constructed to withstand the elements, is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a large roof area, a water ram, or a pump drawing water from a stream.

Feature Measure: Volume of Tank Storage

Scenario Unit: Gallon

Scenario Typical Size: 1,200.0

Scenario Total Cost: $3,417.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.85

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 436 - Irrigation Reservoir

Scenario: #17 - Plastic Tank > 4,000 gallons

Scenario Description:

A 7,000Gallon, above-ground, High Density Polyethylene plastic enclosed tank, is installed on 6" of well-compacted drain rock or a 4" thick reinforced concrete support pad, to store water from a reliable source for irrigation of an area less than one acre. The scenario assumes the typical dimensions of the tank are 102" in diameter and 93" tall. The scenario also assumes a 126" diameter gravel base or concrete pad to extend a minimum of 12" past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, or connecting fittings. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

Before Situation:

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

After Situation:

An above-ground plastic tank, constructed to withstand the elements, is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a large roof area, a water ram, or a pump drawing water from a stream.

Feature Measure: Volume of Tank Storage

Scenario Unit: Gallon

Scenario Typical Size: 7,000.0

Scenario Total Cost: $11,929.41

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 436 - Irrigation Reservoir

Scenario: #34 - Plastic tank, less than or equal to 1,000 gallons

Scenario Description:

A 1,000 Gallon, above-ground, High Density Polyethylene plastic enclosed tank, is installed on 6" of well-compacted drain rock or a 4" thick reinforced concrete support pad, to store water from a reliable source for irrigation of an area less than one acre. The scenario assumes the typical dimensions of the tank are 72" in diameter and 66" tall. The scenario also assumes a 96" diameter gravel base or concrete pad to extend a minimum of 12" past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, or connecting fittings. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

Before Situation:

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

After Situation:

An above-ground plastic tank, constructed to withstand the elements, is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a large roof area, a water ram , or a pump drawing water from a stream.

Feature Measure: Volume of Tank Storage

Scenario Unit: Gallon

Scenario Typical Size: 1,000.0

Scenario Total Cost: $5,920.91

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.92

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 441 - Irrigation System, Microirrigation

Scenario: #1 - SDI (Subsurface Drip Irrigation)

Scenario Description:

A subsurface drip irrigation system (SDI) with a lateral spacing between 37-59 inches. This buried drip irrigation system utilizes a thin wall dripperline or tape with inline emitters at a uniform spacing for the system laterals. The dripperline or tape is normally installed by being plowed in approx. 10-14 inches deep with a chisel shank type plow equipped with tape reels. This type of drip irrigation system utilizes a buried supply manifold with automated zone control valves and a buried flush manifold with manual flush valves. This permanent micro-irrigation system includes an automated filter station, flow meter, backflow prevention device, automated control box or timer, the thin wall dipperline or tape for laterals, both a supply and a flushing manifold and numerous types of water control valves. This is an all-inclusive system starting with the filter station including all required system components out to the flush valves. The water supply line from the water source to the filter station is an irrigation pipeline (430) and is not included as part of this system Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measurement, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

Typical before irrigation situation would normally be an existing inefficient surface or sprinkler irrigation system on a cropland or hayland field. The existing irrigation system would experience poor, non-uniform irrigation applications and significant

After Situation:

A typical practice would be the installation of a subsurface drip irrigation system (SDI) on a 60 acre cropland or hayland field. The system lateral (thin wall dripperline or tape) spacing would 40 inches. This highly efficient SDI (buried) irrigation system provides irrigation water directly to the plant root zone eliminating application losses resulting in a very high water application efficiency and properly designed these SDI systems are capable of very uniform water applications. Typical field size is 60 acres.

Feature Measure: Acres in System

Scenario Unit: Acre

Scenario Typical Size: 60.0

Scenario Total Cost: $158,512.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,641.88

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 441 - Irrigation System, Microirrigation

Scenario: #2 - Surface PE with emitters

Scenario Description:

A micro-irrigation system, utilizing surface PE tubing (can be placed on trellis or above ground) with emitters to provide irrigation for an orchard, vineyard, or other specialty crop grown in a grid pattern. The typical system is a permanent system, installed on a 60 acre vineyard on the ground surface or trellis. The vineyard has a plant spacing of 8 feet x 9 feet. Laterals are spaced 9 feet apart. This system utilizes emitters at each tree or plant as the water application device. This system typically includes a filter system, PE tubing laterals, PVC manifolds, and submains, valves, fittings, emitters, etc. This practice applies to systems designed to discharge < 60 gal/hr. at each individual lateral discharge point. Does not include Pump, Power source, Water source (well or reservoir). Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measurement, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

A vineyard has an inefficient surface flood irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to an vineyard. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Feature Measure: Acres in System

Scenario Unit: Acre

Scenario Typical Size: 60.0

Scenario Total Cost: $163,636.74

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,727.28

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 441 - Irrigation System, Microirrigation

Scenario: #3 - Microjet

Scenario Description:

A micro-irrigation system, utilizing micro-jets to provide irrigation and\or frost protection for an orchard or other specialty crops grown in a grid pattern. The system is installed with all fittings, control valves, pressure reducing/regulating valves, air/vacuum release, sand media/screen/disc filters, pressure gauges, submains, lateral lines, and micro-jet sprayers to deliver water to the trees. This practice applies to systems designed to discharge < 60 gal/hr. at each individual lateral discharge point. Does not include Pump, Power source, Water source (well or reservoir). The typical installation is a permanent, microjet -irrigation system installed on a 60 acre orchard. Typical tree spacing is 20' x 20 feet. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measurement, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

An orchard has an inefficient irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A micro-spray microirrigation system is utilized to provide highly efficient irrigation to an orchard. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Feature Measure: Acres in System

Scenario Unit: Acre

Scenario Typical Size: 60.0

Scenario Total Cost: $243,510.99

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,058.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 441 - Irrigation System, Microirrigation

Scenario: #4 - Surface Tape 1.1 - 6 acres

Scenario Description:

A micro-irrigation system using drip tape or similar type micro-irrigation material placed on the soil surface for vegetables or field crops. Spacing of drip tape or similar type micro irrigation material is based on soil type or row alignment but will typically vary from 18" to 36". This system typically includes a filter system, PE manifolds fittings, drip tape, etc. This practice applies to systems designed to discharge < 60 gal/hr. at each individual discharge point. Does not include Pump, power source, water source. Surface placed drip tape will not meet the 441 practice life and will normally need replacement every year. After first installation drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. Water source is typically groundwater well or public water source. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and Facilities. Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, 590 Nutrient Management, and 595-Itegrated Pest Management.

Before Situation:

A typical before irrigation situation would normally be an existing inefficient sprinkler or surface irrigation system for vegetable or other crop production system. The existing irrigation system would experience poor, nonuniform irrigation applications

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced. Drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. A typical scenario consists of a 3 acre irrigated field with lateral spacing of 2 feet.

Feature Measure: Acres in System

Scenario Unit: Acre

Scenario Typical Size: 3.0

Scenario Total Cost: $8,893.13

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,964.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 441 - Irrigation System, Microirrigation

Scenario: #5 - Surface Tape > 6 acres

Scenario Description:

A micro-irrigation system using drip tape or similar type micro-irrigation material placed on the soil surface for vegetables or other field crops. Spacing of drip tape similar type micro irrigation material is based on soil type or row alignment but will typically vary from 18" to 36". This system typically includes a filter system, PE manifolds fittings, drip tape, etc. Does not include Pump, power source, water source. Surface placed drip tape will not meet the 441 practice life and will normally need replacement every year. After first installation drip tape will be replaced as a part of regular operation and maintenance as required for proper operation of the system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and Facilities. Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, 590 Nutrient Management, and 595-Itegrated Pest Management.

Before Situation:

A typical before irrigation situation would include an existing inefficient sprinkler or surface irrigation system used to irrigate vegetables or other crops. The existing irrigation system would supply excessive or inadequate non-uniform irrigation appli

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a field. Crop water requirements are met. Water applications are normally reduced and runoff eliminated. Offsite water quality is improved, and on site water use reduced. Drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. A typical scenario consists of a 15 acre irrigated field with lateral spacing of 2.5 feet.

Feature Measure: Acres in System

Scenario Unit: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $27,658.50

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,843.90

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 441 - Irrigation System, Microirrigation

Scenario: #6 - Hoop House Surface Microirrigation

Scenario Description:

Surface Microirrigation system for 30' x 96' seasonal high tunnel, 24" rows with emitters on a 12" spacing. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

A field has an inefficient garden-hose based sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to an area. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Feature Measure: Microirrigation area

Scenario Unit: Square Foot

Scenario Typical Size: 2,880.0

Scenario Total Cost: $1,343.69

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.47

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 441 - Irrigation System, Microirrigation

Scenario: #17 - Surface Tape < or = 1 acre

Scenario Description:

A micro-irrigation system using drip tape or similar type micro-irrigation material placed on the soil surface for vegetables or field crops. Spacing of drip tape or similar type micro irrigation material is based on soil type or row alignment but will typically vary from 18" to 36". This system typically includes a filter system, PE manifolds fittings, drip tape, etc. This practice applies to systems designed to discharge < 60 gal/hr. at each individual discharge point. Does not include Pump, power source, water source. Surface placed drip tape will not meet the 441 practice life and will normally need replacement every year. After first installation drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. Water source is typically groundwater well or public water source. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and Facilities. Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, 590 Nutrient Management, and 595-Itegrated Pest Management.

Before Situation:

A typical before irrigation situation would normally be an existing inefficient sprinkler or surface irrigation system for vegetable or other crop production system. The existing irrigation system would experience poor, nonuniform irrigation applications

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced. Drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. A typical scenario consists of a 1 acre irrigated field with lateral spacing of 3 feet.

Feature Measure: Acres in System

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $3,472.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,472.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 441 - Irrigation System, Microirrigation

Scenario: #44 - Small Microirrigation System

Scenario Description:

A small scale surface microirrigation system using drip tape or similar type micro-irrigation material placed on the soil surface to irrigate vegetables or field crops. Typically applied on a 40' by 40' plot, with 24" spaced rows, and emitters on a 12" spacing. Submains break plot into several smaller zones. System includes disk filter and chemical injection for chemigation. Water meter is not included. Natural Resource Concern(s): Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533 - Pumping Plant, 449 - Irrigation Water Management, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 328 - Conservation Crop Rotation, and 590 - Nutrient Management.

Before Situation:

A field has an inefficient garden-hose based sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a small plot. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on-site water use is reduced.

Feature Measure: Microirrigation area

Scenario Unit: Square Foot

Scenario Typical Size: 1,600.0

Scenario Total Cost: $2,025.31

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.27

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 441 - Irrigation System, Microirrigation

Scenario: #67 - Small Surface Tape System

Scenario Description:

A small scale micro-irrigation system using drip tape or similar type micro-irrigation material placed on the soil surface for vegetables or field crops. Spacing of drip tape or similar type micro irrigation material is based on soil type or row alignment but will typically vary from 18" to 36". This system typically includes a filter system, PE manifolds fittings, drip tape, etc. This practice applies to systems designed to discharge < 60 gal/hr. at each individual discharge point. Does not include Pump, power source, water source. Surface placed drip tape will not meet the 441 practice life and will normally need replacement every year. After first installation drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and Facilities. Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, 590 Nutrient Management, and 595-Itegrated Pest Management.

Before Situation:

A field has an inefficient garden-hose based sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced. Drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. A typical scenario consists of a 1,600 square feet irrigated field with lateral spacing of 2 feet.

Feature Measure: Microirrigation area

Scenario Unit: Square Foot

Scenario Typical Size: 1,600.0

Scenario Total Cost: $1,653.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.03

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 442 - Sprinkler System

Scenario: #1 - Center Pivot System

Scenario Description:

Installation of a low pressure center pivot system. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications). Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

A 160 acre field is flood irrigated. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers e

After Situation:

The existing surface irrigation system is converted to a low pressure center pivot. Corners are converted to non-irrigated cropland. The pivot is 1300 feet in length with pressure regulators and low pressure sprinklers on drops. The new irrigation system has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated. This center pivot scenario includes all hardware from the pivot point, including the concrete pad the pivot is placed on.

Feature Measure: Length of Center Pivot Later

Scenario Unit: Foot

Scenario Typical Size: 1,300.0

Scenario Total Cost: $118,268.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $90.98

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 442 - Sprinkler System

Scenario: #4 - Solid Set System

Scenario Description:

A solid set irrigation system. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

The typical installation will be on cropland with some existing inefficient irrigation. The farm is typically producing specialty crops, such as fresh vegetables.

After Situation:

The system is installed on 10 acres or less. The installed solid set system has 3-4 inch pipe sizes and sprinklers set 30 - 50 ft apart. Improved distribution uniformity and irrigation efficiency will result.

Feature Measure: Area of Irrigation System

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $56,925.46

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,692.55

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 442 - Sprinkler System

Scenario: #5 - Traveling Gun System, < 2 inch Hose

Scenario Description:

A portable small gun system used to apply irrigation water on small fields. A small traveling gun irrigation system is installed to apply water uniformly and at an acceptable application rate operated under pressure to effectively irrigate less than 3 acres. The irrigation system is installed with all necessary appurtenances. Resource concerns: Soil Erosion (Concentrated flow erosion, e.g. overflowing waste storage) and Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from liquid manure) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Conservation Crop Rotation (328), Cover Crop (340), Nutrient Management (590), Waste Utilization (633), Manure Transfer (634)

Before Situation:

An existing traveling gun on a 5 acre field is inefficient and is not applying water uniformly or not at an acceptable application rate. Excess applied water causes irrigation induced erosion, runoff and deep percolation. The runoff and deep percolation d

After Situation:

A small traveling gun irrigation system is installed to irrigate 5 acres based on the determined spacing needs. Irrigation is applied efficiently and uniformly to maintain adequate soil water for plant growth without causing excessive water loss, erosion, or water quality degradation The irrigation system is installed with all necessary appurtenances.

Feature Measure: Number of Traveling Gun Sy

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $15,628.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $15,628.27

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 442 - Sprinkler System

Scenario: #6 - Traveling Gun System, 2 to 3 inch Hose

Scenario Description:

A portable big gun system used to apply waste water from animal feeding operations. This traveling big gun unit includes a sprinkler, towable cart, 1000' or more of PE hard hose, a self propelled reel that moves the sprinkler toward the reel during operation. The reel attaches to a mainline with appropriately designed towpath width. The scenario describes an irrigation system that is typical to confined animal feeding operations. Resource concerns: Soil Erosion (Concentrated flow erosion, e.g. overflowing waste storage) and Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from liquid manure) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Conservation Crop Rotation (328), Cover Crop (340), Nutrient Management (590), Waste Utilization (633), Manure Transfer (634)

Before Situation:

A confined, animal operation has a waste management system that exceeds its capacity, or a operation that does not have a waste management system in place. The inefficiency of the existing system or the lack of a waste management system has an impact on t

After Situation:

The big gun applies animal manure in an appropriate quantity and location that eliminates both runoff of the manure and deep percolation of excess nutrients, salts, and pathogens. The big gun system is typically located on 50 acres or less of hay/pasture land, or 100 acres or less of cropland. The system includes a large irrigation gun with 1" to 1½" orifice mounted onto a movable cart. 1000' or more flexible 3" PE pipe is attached to the cart on one end and a large reel on the other end. The reel serves as storage are for the pipe as the cart moves back to the reel. The reel is turned by a small engine which gradually pulls the flexible pipe and cart back to the reel/base.

Feature Measure: Number of Traveling Gun Sy

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $25,603.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $25,603.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 442 - Sprinkler System

Scenario: #7 - Traveling Gun System, > 3 inch Hose

Scenario Description:

A portable big gun system used to apply waste water from animal feeding operations. This traveling big gun unit includes a sprinkler, towable cart, 1200' or more of PE hard hose, a self propelled reel that moves the sprinkler toward the reel during operation. The reel attaches to a mainline with appropriately designed towpath width. The scenario describes an irrigation system that is typical to confined animal feeding operations. Resource concerns: Soil Erosion (Concentrated flow erosion, e.g. overflowing waste storage) and Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from liquid manure) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Conservation Crop Rotation (328), Cover Crop (340), Nutrient Management (590), Waste Utilization (633), Manure Transfer (634)

Before Situation:

A confined, animal operation has a waste management system that exceeds its capacity, or a operation that does not have a waste management system in place. The inefficiency of the existing system or the lack of a waste management system has an impact on t

After Situation:

The big gun applies animal manure in an appropriate quantity and location that eliminates both runoff of the manure and deep percolation of excess nutrients, salts, and pathogens. The big gun system is typically located on 50 acres or less of hay/pasture land, or 100 acres or less of cropland. The system includes a large irrigation gun with 1" to 1½" orifice mounted onto a movable cart. 1200' or more flexible 4" PE pipe is attached to the cart on one end and a large reel on the other end. The reel serves as storage are for the pipe as the cart moves back to the reel. The reel is turned by a small engine which gradually pulls the flexible pipe and cart back to the reel/base.

Feature Measure: Number of Traveling Gun Sy

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $49,126.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $49,126.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 442 - Sprinkler System

Scenario: #8 - Pod System

Scenario Description:

A portable irrigation system consisting of Polyethylene (PE) pipe and pods that have attached sprinklers. This scenario addresses installation of all pod style irrigation sprinkler systems. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

Pastureland is flood irrigated and has poor irrigation efficiency and distribution uniformity. The slope and irregular shape of the field limit the potential for improved management to improve the irrigation efficiency or the distribution uniformity. Irri

After Situation:

A 10 acre irrigated pasture with a medium pressure irrigation system consisting of sprinkler pods along a PE line is installed. The pods and PE line are placed in different sections of the pasture by dragging both with a four wheeler. The PE line is 660 feet in length and has 14 pods evenly spaced along its length. The improved distribution uniformity and irrigation efficiency reduces the inefficient use of water on irrigated land, reducing irrigation water applied and energy use. Water application rates meet the pasture vegetation consumptive use requirements. Runoff and deep percolation as a result of irrigation are eliminated, and the receiving waters are no longer degraded.

Feature Measure: Number of Sprinkler Pods

Scenario Unit: Each

Scenario Typical Size: 14.0

Scenario Total Cost: $5,592.40

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $399.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 442 - Sprinkler System

Scenario: #9 - Renovation of Existing Sprinkler System

Scenario Description:

Center Pivot and Linear Move sprinkler systems are used in large crop fields with fairly regular field borders and flat topography. The scenario involves changing nozzles on center pivot or lateral move irrigation systems to low-pressure systems to improve efficiency of water use and reduce energy use. This scenario is intended for cropland areas where the objective is water conservation. A typical scenario assumes a 1300 LF span, including end booms renozzled with low-pressure nozzles. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

A center pivot or lateral move system has high pressure sprinklers. The nozzles are worn and water is applied non-uniformly. Water runs off the field and degrades the receiving waters. Deep percolation in some parts of the field degrades the ground water

After Situation:

A Center Pivot or Linear Move sprinkler system with a span of 1300 linear feet is re-nozzled with low-pressure nozzles. The irrigation water is applied efficiently and uniformly to maintain adequate soil moisture for optimum plant growth. Runoff and deep percolation are eliminated, and the surface and ground water is no longer degraded. The irrigation induced soil erosion caused by runoff is also eliminated. The lower pressure requirements of the sprinklers reduces the energy used by the pump.

Feature Measure: Length of Lateral Retrofitted

Scenario Unit: Foot

Scenario Typical Size: 1,300.0

Scenario Total Cost: $10,372.51

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7.98

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 442 - Sprinkler System

Scenario: #63 - Small Solid Set, Above Ground Laterals

Scenario Description:

A permanent solid set irrigation system with buried submains and above ground laterals such as polyethylene flexible tubing. The typical system is installed on a 2 acre orchard or nursery, with plant spacing of 15 feet x 22 feet. Laterals are spaced 22 feet apart, however other spacing for this scenario apply. This system utilizes sprayers or minisprinklers at each tree or plant. This system typically includes a filter system, PE tubing laterals, PVC manifolds, and submains, valves, fittings, and emitters. System installation does not include a flowmeter, Pump, Power source, Irrigation Water Conveyance to the irrigated field, or Water source (well or reservoir). Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449).

Before Situation:

The typical installation will be on an orchard, nursery, or vineyard with an existing inefficient irrigation system.

After Situation:

An irrigation system is utilized to provide improved distribution uniformity and irrigation efficiency to an orchard, nursery, or vineyard. Runoff and water applications are reduced, resulting in offsite water quality improvement and on site water use reduction.

Feature Measure: Area in Irrigation System

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $7,215.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,607.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 442 - Sprinkler System

Scenario: #87 - VRI System Retrofit Zone

Scenario Description:

Integrating variable application technology onto a center pivot system or linear move for precision zone placement of water along the length of the system. A variable application over the field based on either1) EC mapping, 2) previous year(s) harvest yield maps, 3) soil properties, 4) within field ET variability, 5) topography, or combination of each. This scenario is to renovate a previously installed pivot or linear move irrigation system with proper modular components and pressure regulating devices, GPS for field locations, new control panel, valves, and other needed components to install a VRI system for more effective utilization of water. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and groundwater, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping), and protection of wetland areas enrolled in conservation program and other environmental sensitive areas. Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Wetland Restoration (657), Wetland Enhancement (658) Wetland Creation (659)

Before Situation:

A center pivot or lateral move system applies water at the same rate regardless of variations in the field that affect crop health or water quality. Deep percolation in some parts of the field degrades the groundwater quality. Chemigation applications are

After Situation:

A Center Pivot or Linear Move sprinkler system with a span of 1300 linear feet is has modular VRI components added to the system which increases irrigation efficiency, by utilizing a modern center pivot system, resulting in water savings. The irrigation water is applied efficiently to maintain adequate soil moisture for optimum plant growth. Runoff is eliminated and deep percolation is controlled based on salt leaching requirements. The surface and ground water is no longer degraded. The irrigation induced soil erosion caused by runoff is also eliminated. The reduced water volume delivered to the sprinklers reduces the energy used by the pump. Chemigation applications do not apply inappropriate amounts of chemicals near sensitive areas.

Feature Measure: Length of Center Pivot or La

Scenario Unit: Linear Foot

Scenario Typical Size: 1,300.0

Scenario Total Cost: $64,790.09

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $49.84

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 442 - Sprinkler System

Scenario: #88 - Gravity to Pivot Conversion with VRI Zone Control

Scenario Description:

Upgrading existing irrigation system with a more uniform and efficient (vendor provided and installed modular system) Center Pivot or Linear Move system for the purpose of protecting water quality and utilizing water effectively. Integrating variable application technology onto a center pivot system for precision zone placement of water along the length of the system for water savings. A variable application over the field based on either 1) EC mapping, 2) previous year(s) harvest yield maps, 3) soil properties, 4) within field ET variability, 5) topography, or combination of each. This scenario is a new system to replace an existing gravity system, with the proper components, nozzles, and pressure regulating devices along with other needed components for installation of a VRI system for more effective utilization of water. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping), and protection of wetland areas enrolled in conservation program and other environmentally sensitive areas. Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Wetland Restoration (657), Wetland Enhancement (658) Wetland Creation (659)

Before Situation:

Flood application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients, salts, and che

After Situation:

A new Center Pivot or Linear Move sprinkler system with a span of 1300 linear feet and a modular VRI system increases irrigation efficiency utilizing a modern center pivot system, resulting in water savings. The irrigation water is applied efficiently to maintain adequate soil moisture for optimum plant growth. Runoff is eliminated, deep percolation is controlled based on salt leaching requirements, and the surface and groundwater is no longer degraded. The irrigation induced soil erosion caused by runoff is also eliminated. The reduced water volume delivered to the sprinklers reduces the energy used by the pump.

Feature Measure: Length of Center Pivot or La

Scenario Unit: Linear Foot

Scenario Typical Size: 1,300.0

Scenario Total Cost: $178,900.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $137.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 442 - Sprinkler System

Scenario: #89 - Mobile Drip Irrigation Retrofit, Center Pivot

Scenario Description:

Center pivot sprinkler systems are used to irrigate low-profile crops (e.g., alfalfa or small grains) to medium-profile crops (e.g., corn) in fields with regular field borders and flat to slightly sloping terrain. The scenario involves retrofitting an existing center pivot irrigation system to incorporate dragged low-pressure drip irrigation lines to improve efficiency of water use and reduce energy use. A typical scenario assumes a 1,300 linear foot span, retrofitted to include heavy wall drip hoses in place of nozzles or sprinkler heads. Drip hoses are spaced 20 to 60 inches apart and include drippers of 1 to 2 gallon per hour flowrate and are spaced approximately every 6 to 12 inches on the driplines. Systems with shorter profile crops may have a manifold that is 3 to 4 feet from the ground. Crops are typically planted in a circular pattern relative to the center pivot path. In-line mesh filtration and chemigation is included. Sand separator not included. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. operating pressure and volume pumped) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

A center pivot system that has high pressure sprinklers. The nozzles are worn and water is applied non-uniformly. Water runs off the field and degrades receiving waterbodies. Deep percolation in some parts of the field degrades groundwater quality. The hi

After Situation:

A center pivot sprinkler system with a span of 1,300 linear feet is retrofitted to apply water through dragged surface drip irrigation lines. Irrigation water is applied efficiently and uniformly directly to the soil surface to maintain soil moisture for optimal plant growth. Runoff and deep percolation are addressed, and surface waterbodies are no longer degraded. Lower pressure requirements and higher application efficiency of the center mobile drip irrigation retrofit reduces the energy used by the pump.

Feature Measure: Length of Lateral Retrofitted

Scenario Unit: Linear Foot

Scenario Typical Size: 1,300.0

Scenario Total Cost: $24,301.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $18.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 443 - Irrigation System, Surface and Subsurface

Scenario: #1 - Surge Valve & Controller

Scenario Description:

This scenario would typically include installation and utilization of a 10-inch surge valve with automated controller (including all appurtenances) and installation labor needed to convert from a conventional surface irrigated system to a surge irrigation system. Typical field size is 80 acres. The surge valve will be used with PVC Gated Pipe or PE Gated Tubing to convey and distribute irrigation water to alternating irrigation sets in a timed surge cycle that results in reduced a surging irrigation application. The surging action increases rate of advance along set length, reduces deep percolation at upper end of field, increases uniformity of application along row length, and on lower intake soils can significantly reduce runoff losses. The result is improved irrigation efficiency, reduced leaching and erosion losses, and conserved energy. This scenario does not include gated pipe or associated practices. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation- Excess nutrients in surface and ground waters, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities Associated Practices: 464-Irrigation Land leveling, 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

Unacceptable irrigation application uniformity along existing surface irrigation system furrow or border length caused by excessive run length or soil infiltration rate when operated with continuous inflow on existing system. System is over irrigated in a

After Situation:

A surge surface irrigation system is in place. After implementation, distribution uniformity and irrigation efficiency is improved, by reducing irrigation application volume and deep percolation losses. Runoff reductions, reduced energy use, and air quality improvements can also result.

Feature Measure: Number of Surge Valves

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,192.06

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,192.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 443 - Irrigation System, Surface and Subsurface

Scenario: #21 - Ebb and Flow Benches

Scenario Description:

Water tight benches, that are housed within the interior of a greenhouse, are installed that re-circulates (ebb and flow) water for irrigation purposes. Typical system consist of bay with three benches 4 feet wide and 100 feet long (1200 sq ft). The bench is flooded then slowly drained to allow water to upflux of water into potted plants located on the bench. This type of drip irrigation system utilizes a buried supply manifold with automated zone control valves and a buried drainage manifold. This permanent subsurface irrigation system will include a filter station, flow meter, backflow prevention device, automated control box or timer, both a supply and drainage manifold, sump and numerous types of water control valves. This scenario includes all material and labor to install the benches filter and automation system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation Excessive leaching of nutrients into ground and surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 533-Pumping Plant, 620-Underground Outlet

Before Situation:

An existing inefficient microirrigation or sprinkler irrigation system in a greenhouse. The existing irrigation system experiences poor, non-uniform irrigation applications and significant water losses affecting both water quantity and water quality.

After Situation:

This highly efficient subsurface irrigation system provides irrigation water directly to the plant root zone by capillary action and recirculates excess water for reuse, eliminating application losses resulting from water leaching through the pot during irrigation or being applied to areas without pots.

Feature Measure: Square Feet

Scenario Unit: Square Foot

Scenario Typical Size: 1,200.0

Scenario Total Cost: $24,282.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $20.24

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 443 - Irrigation System, Surface and Subsurface

Scenario: #36 - Flood Floor Irrigation

Scenario Description:

The scenario consists of a concrete floor and under floor water distribution system. The plants receive water from the flooded floor through the root zone. Only needed water is taken up by the soil medium. After irrigation is complete, all water is cycled to the holding tank and is reused for the next irrigation cycle. For pumps - use CPS 533 - Pumping Plant , for piping use CPS 430 - Irrigation Pipeline. Based on flood floor design

Before Situation:

The greenhouse plants are watered by hand or by sprinkler system. Water drips onto the floor and sinks into the earthen floor, runs off or evaporates. Water is lost to the plants and can become contaminated with fertilizers or pesticides.

After Situation:

Greenhouse irrigation water is supplied by a Flood-Floor irrigation system. Water is taken up by the soil medium. All remaining water is recycled for reuse. No water is wasted or contaminated.

Feature Measure: Square foot of flooded area

Scenario Unit: Square Foot

Scenario Typical Size: 21,600.0

Scenario Total Cost: $214,332.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9.92

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 443 - Irrigation System, Surface and Subsurface

Scenario: #61 - Nutrient Film Technique (NFT)

Scenario Description:

A nutrient film technique (NFT) system where a very shallow stream (film) of water containing nutrients required for plant growth circulates between gently sloped growing channels (troughs) and a nutrient reservoir housed within a greenhouse. Plant roots are contained in watertight growing channels and are in contact with the nutrient solution. Typical system has an overall footprint of 3,000 sq. ft. and consists of nutrient reservoir tank, submersible pump for nutrient solution recirculation, growing channels, metal table framing, and all the necessary plumbing. The scenario includes all material and labor to install the NFT system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation Excessive leaching of nutrients into ground and surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 430 - Irrigation Pipeline and 620-Underground Outlet

Before Situation:

An existing inefficient microirrigation or sprinkler irrigation system in a greenhouse. The existing irrigation system experiences poor, non-uniform irrigation applications and significant water losses affecting both water quantity and water quality.

After Situation:

This highly efficient subsurface irrigation system provides irrigation water directly to the plant root zone by capillary action and recirculates excess water for reuse, eliminating application losses resulting from water leaching through the pot during irrigation or being applied to areas without pots.

Feature Measure: Square Feet

Scenario Unit: Square Foot

Scenario Typical Size: 3,000.0

Scenario Total Cost: $32,508.61

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $10.84

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 447 - Irrigation and Drainage Tailwater Recovery

Scenario: #13 - Delta Tail Water Pit

Scenario Description:

A recovery pit is constructed to temporality store the excess irrigation water and create a pumping pool so that the excess water can be recovered and reused. Typical pit size is trapezoidal ditch with 14ft bottom x 10ft depth x 1750 ft length with 2:1 side slopes. The total yardage of earthwork is 22,037 cy. Construction is typically done with either tractors and pans or with dozer and excavator.

Before Situation:

Excess irrigation water collects at lower ends of field and backs up into crops and causes plant stress or causes erosion and travels off farm in a drainage ditch causing water quality issues in lower watersheds. Excess irrigation water and runoff during

After Situation:

Excess irrigation water is collected and directed into a recovery system where the water can be recycled and reused for irrigation. Sedimentation has a chance to settle out of the water allowing for less sediment to travel down stream. All runoff has an opportunity to be collected.

Feature Measure: Excavated Material

Scenario Unit: Cubic Yard

Scenario Typical Size: 22,307.0

Scenario Total Cost: $43,253.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 447 - Irrigation and Drainage Tailwater Recovery

Scenario: #14 - Tailwater Collection Structure

Scenario Description:

A collection structure designed and constructed to efficiently direct excess tailwater from a field and deliver into a tailwater recovery ditch or tailwater recovery pit. Typical installation will be a flashboard riser or drop inlet structure placed at edge of field through an earthen berm to direct tailwater into tailwater recovery system. Resource concern(s): Water quality, inefficient use of water. Cost estimate based on 18' weir and 55' long, 15" diameter barrel.

Before Situation:

During irrigation, tailwater exits the field in an uncontrolled manner and is being lost downstream and cannot be recovered for future use.

After Situation:

Tailwater is collected through structure at a prescribed location and directed into tailwater recovery system for re-use. Other associated practices may include Irrigation reservoir (436), Irrigation and Drainage Tailwater Recovery Pit (447), Surface Drain, Main or Lateral (608), Surface Drain, Field Ditch (607)

Feature Measure: weir dia (in) x barrel length (

Scenario Unit: Inch-Foot

Scenario Typical Size: 990.0

Scenario Total Cost: $5,023.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.07

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 449 - Irrigation Water Management

Scenario: #1 - Basic IWM <= 30 acres

Scenario Description:

A low Intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by the feel method, volumes of irrigation water are based on energy or water district bills, records are kept on paper copies, and calculations are made by hand. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkle, 328-Conservation Crop Rotation, 590-Nutrient Management or 447-Tail Water Recovery.

Before Situation:

The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 15 ac. corn field (average between 1 ac. and 30 ac.)

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Area of Irrig. Systems Mana

Scenario Unit: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $437.51

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $29.17

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 449 - Irrigation Water Management

Scenario: #2 - Basic IWM > 30 acres

Scenario Description:

A low Intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by the feel method, volumes of irrigation water are based on energy or water district bills, records are kept on paper copies, and calculations are made by hand. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkle, 328-Conservation Crop Rotation, 590-Nutrient Management or 447-Tail Water Recovery.

Before Situation:

The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 100 acre corn field with a sprinkler irrigation syst

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Area of Irrig. Systems Mana

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $661.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 449 - Irrigation Water Management

Scenario: #3 - Intermediate IWM <= 30 acres

Scenario Description:

A medium intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by in-field moisture sensors with manual downloads. Irrigation amounts are recorded from a flow meter near the pump. Records are input manually into an irrigation scheduling computer program. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkle, 328-Conservation Crop Rotation, 590-Nutrient Management or 447-Tail Water Recovery.

Before Situation:

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a corn field with a surface irrigation system. The typica

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Area of Irrig. Systems Mana

Scenario Unit: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $682.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $45.47

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 449 - Irrigation Water Management

Scenario: #4 - Intermediate IWM > 30 acres

Scenario Description:

A medium intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by in field moisture sensors with manual downloads. Irrigation amounts are recorded from a flow meter near the pump. Records are input manually into an irrigation scheduling computer program. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkle, 328-Conservation Crop Rotation, 590-Nutrient Management or 447-Tail Water Recovery.

Before Situation:

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 100 acre corn field with a sprinkler irrigation system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Area of Irrig. Systems Mana

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $906.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $18.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 449 - Irrigation Water Management

Scenario: #5 - Advanced- Soil Moisture Sensors

Scenario Description:

This practice includes the installation of soil moisture sensors such as tensiometers, gyp blocks, capacitance sensors etc., that are installed and read to determine point in time soil moisture by depth. The installation includes the purchase of soil moisture meters and sensors, installation equipment, and labor to install and read sensors or meter. Typical Scenario involves installation of resistance sensor blocks in a 80 acre field of irrigated cropland. Producer periodically monitors soil moisture sensors during the growing season. Meters used to read sensors may be portable. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkle, 328-Conservation Crop Rotation, 590-Nutrient Management or 447-Tail Water Recovery.

Before Situation:

Producer uses feel method to estimate soil moisture for scheduling irrigation.

After Situation:

Producer has installed four sensors at each monitoring site to a depth of four feet with one sensor representing each foot of depth. Producer uses periodic soil moisture measurements to schedule irrigation resulting supplemented by weather station data providing improved irrigation water management and reduced energy use. Two monitoring stations are installed.

Feature Measure: Number of Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 2.0

Scenario Total Cost: $1,976.19

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $988.10

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 449 - Irrigation Water Management

Scenario: #6 - Soil Moisture Sensors with Data Recorder

Scenario Description:

This practice includes the installation of one weather station, eight electrical soil moisture sensors such as capacitance or resistance sensors that are monitored to determine soil moisture. The installation includes the purchase of soil moisture sensors, installation equipment (probe or auger), and two data loggers to log continuous soil moisture data that can be downloaded to a personal computer and associated graphing software. Typical Scenario involves installation of resistance sensor blocks in a 120 acre field of sprinkler irrigated cropland, two monitor stations are installed representing 60 acres of typical soil and crop. Producer periodically monitors soil moisture sensors during the growing season. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkle, 328-Conservation Crop Rotation, 590-Nutrient Management or 447-Tail Water Recovery.

Before Situation:

Producer uses feel method to estimate soil moisture for scheduling irrigation in the field.

After Situation:

Producer has installed four sensors at each monitoring site to a depth of four feet with one sensor representing each foot of depth. Producer periodically downloads continuously recorded soil moisture measurements that are used to schedule irrigation more effectively resulting in improved irrigation water management and reduced energy use.

Feature Measure: Number of Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 2.0

Scenario Total Cost: $3,275.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,637.73

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 449 - Irrigation Water Management

Scenario: #121 - Advanced IWM < 1 acre

Scenario Description:

A high intensity irrigation water management system for producers using a checkbook method with advanced methods of determining irrigation water applied, and estimating crop evapotranspiration, monitoring field soil moisture, or monitoring crop temperature stress. The irrigation water management system is typically located on a small-scale agricultural operation cultivated by an individual or a group of people (e.g., repurposed land, private or community-gardens). Multiple crops are grown in the same space or within the growing season on less than 1 acre. Typical methods include flow measurement, daily record keeping, and use of real-time evapotranspiration estimates (such as those provided dedicated weather stations) and/or soil moisture sensors with automated data logging to monitor field soil moisture content and/or crop temperature. For this scenario, soil moisture is determined by automated soil moisture monitoring stations equipped with telemetry data. Irrigation amounts are recorded from a flow meter near the pump. Telemetry data is automatically sent to a computer with irrigation software. Irrigator also receives real time data via mobile phone applications. Some data such as total water applied may be entered into computer software manually. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use- Equipment and facilities. Associated Practices: 441-Irrigation System, Microirrigation; 442-Irrigation System, Sprinkler; 443-Irrigation System, Surface and Subsurface.

Before Situation:

A sub-acre mixed or intercropped area is irrigated with a sprinkler or microirrigation system. The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,132.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,132.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 449 - Irrigation Water Management

Scenario: #122 - Intermediate IWM < 1 acre

Scenario Description:

A medium intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). The irrigation water management system is typically located on a small-scale agricultural operation cultivated by an individual or a group of people (e.g., repurposed land, private or community-gardens). Multiple crops are grown in the same space or within the growing season on less than 1 acre. For a typical scenario, soil moisture is determined by in-field moisture sensors with manual downloads. Irrigation amounts are recorded from a flow meter near the pump. Records are input manually into an irrigation scheduling computer program. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System, Microirrigation; 442-Irrigation System, Sprinkler; 443-Irrigation System, Surface and Subsurface.

Before Situation:

A sub-acre mixed or intercropped area is irrigated with a sprinkler or microirrigation system. The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,706.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,706.29

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 449 - Irrigation Water Management

Scenario: #123 - Basic IWM < 1 acre

Scenario Description:

A low Intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). The irrigation water management system is typically located on a small-scale agricultural operation cultivated by an individual or a group of people (e.g., repurposed land, private or community-gardens). Multiple crops are grown in the same space or within the growing season on less than 1 acre. For a typical scenario, soil moisture is determined by the feel method, volumes of irrigation water are based on energy or water district bills, records are kept on paper copies, and calculations are made by hand. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface.

Before Situation:

A sub-acre mixed or intercropped area is irrigated with a sprinkler or microirrigation system. The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,279.72

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,279.72

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 460 - Land Clearing

Scenario: #2 - Heavy Equipment

Scenario Description:
Site preparation of a field with dozer or equivalent heavy equipment to achieve a conservation objective. Typical scenario is approximately 10 acres of trees and shrubs to be cleared. The resource concern is determined by the conservation objective met with the final practice applied to the field.

Before Situation:
Forested field of approximately 10 acres, with moderate density evenly spaced tree canopy.

After Situation:
Crew uses 200 HP dozer to clear trees and prepare field for conservation objective, includes on-site debris disposal as necessary. Associated practices, like plantings, other structures, or irrigation/drainage water management practices, would be contracted separately as needed.

Feature Measure: Area Cleared

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $11,312.32

Total Cost per Unit: $1,131.23

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 462 - Precision Land Forming and Smoothing

Scenario: #11 - Site Stabilization

Scenario Description:

The site contains a gully or other site specific topographic problem. Site conditions require attention to elevation and grade. Resource concerns are EXCESS / INSUFFICIENT WATER -(Ponding, Flooding) and SOIL EROSION -(Sheet, Rill)

Before Situation:

The site, commonly a crop field or CAFO, has localized gully or topographic issues causing drainage or erosion problems. Typical situation is a gully 10 feet wide and 5 feet deep.

After Situation:

Land has been shaped to the required elevations and grades. Resource concerns have been treated. Associated practices, like plantings or drainage water management practices, would be contracted separately as needed.

Feature Measure: Cubic yards of material plac

Scenario Unit: Cubic Yard

Scenario Typical Size: 6,000.0

Scenario Total Cost: $15,564.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.59

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 462 - Precision Land Forming and Smoothing

Scenario: #18 - Minor Shaping

Scenario Description:
The land surface is shaped or leveled to a specific elevation and grade for various land uses. Cuts and fills are small. The resource concerns are EXCESS / INSUFFICIENT WATER -(Ponding, Flooding) and SOIL EROSION -(Sheet, Rill)

Before Situation:
The field has minor topographic issues or problems with surface drainage or erosion which can be corrected without land leveling or land smoothing. Site conditions require attention to elevation and grade. Typical situation is a 5 acre field. Material to

After Situation:
Land has been shaped to the required elevations and grades. Resource concerns have been treated. Associated practices, like plantings or drainage water management practices, would be contracted separately as needed.

Feature Measure: Acres of land treated

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $3,856.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $771.25

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 462 - Precision Land Forming and Smoothing

Scenario: #32 - Minor Shaping - Field Scale

Scenario Description:
Removing irregularities on the land surface of cropland by use of heavy equipment.

Before Situation:
Field damaged by flooding, past agricultural practices, or other topographic issues causing drainage or field workability issues. Typically less than 100 cy/acre material moved.

After Situation:
Land level, backhoe, bulldozer or other heavy equipment used to correct irregularities and address drainage or workability issues.

Feature Measure: Acres of land treated

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $4,035.70

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $100.89

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 464 - Irrigation Land Leveling

Scenario: #14 - Small Scale Irrigation Land Leveling

Scenario Description:

This is scenario will level a typical 10 acres of irrigated crop land surface to enhance uniform flow of surface water to improve irrigation efficiency using dirtpans/carry-all/pan-scraper equipment. The typical volume of earth moved is 100 to 500 cubic yards per acre. Resource Concern: Excess/Insufficient - Inefficient Use of Irrigation Water Associated Conservation Practices: 433 - Irrigation System, Surface and Subsurface; 607 - Surface Drain, Field Ditch; 388 - Irrigation Field Ditch; 449 - Irrigation Water Management; or 587 - Structure for Water Control.

Before Situation:

Irregular field surface reduces uniformity of surface application and thus irrigation efficiency by localized ponding and/or excess runoff/run-on.

After Situation:

Cropland will be reshaped to provide uniform distribution of irrigation water in order to promote irrigation efficiencies.

Feature Measure: Acres of Area

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $11,746.48

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,174.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 464 - Irrigation Land Leveling

Scenario: #26 - Irrigation Land Leveling

Scenario Description:

This is scenario will level a typical 80 acres of irrigated crop land surface to enhance uniform flow of surface water to improve irrigation efficiency using dirtpans/carry-all/pan-scraper equipment. The typical volume of earth moved is 100 to 500 cubic yards per acre. Resource Concern: Excess/Insufficient - Inefficient Use of Irrigation Water Associated Conservation Practices: 433 - Irrigation System, Surface and Subsurface; 607 - Surface Drain, Field Ditch; 388 - Irrigation Field Ditch; 449 - Irrigation Water Management; or 587 - Structure for Water Control.

Before Situation:

Irregular field surface reduces uniformity of surface application and thus irrigation efficiency by localized ponding and/or excess runoff/runon.

After Situation:

Cropland will be reshaped to provide uniform distribution of irrigation water in order to promote irrigation efficiencies.

Feature Measure: Volume of Earth Moved

Scenario Unit: Cubic Yard

Scenario Typical Size: 28,000.0

Scenario Total Cost: $69,591.18

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.49

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 468 - Lined Waterway or Outlet

Scenario: #1 - Turf Reinforced Matting

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with Turf Reinforced Matting (TRM). 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. TRM is installed over 100% of the width of the waterway to prevent scour and aid in waterway establishment. Cost include excavation, spoiling of excess material, and furnishing and installing TRM. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:

TRM lined waterway is 300 ' long by 15' wide by 1.5' deep. The practice is installed using a hydraulic excavator. TRM is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Foot

Scenario Typical Size: 4,500.0

Scenario Total Cost: $6,397.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 468 - Lined Waterway or Outlet

Scenario: #2 - Rock Lined, 12 inch (Region)

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 9", Velocity ~ 8 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 9" Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:

Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Foot

Scenario Typical Size: 4,500.0

Scenario Total Cost: $29,755.50

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.61

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 468 - Lined Waterway or Outlet

Scenario: #3 - Rock Lined - 18 inches

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 12", Velocity ~ 9 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 12" Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:

Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Foot

Scenario Typical Size: 4,500.0

Scenario Total Cost: $44,032.12

Total Cost per Unit: $9.78

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 468 - Lined Waterway or Outlet

Scenario: #4 - Rock Lined, 24 inch

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 18", Velocity ~ 11 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 18" Rock Riprap to a thickness of 24". Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:

Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Foot

Scenario Typical Size: 4,500.0

Scenario Total Cost: $58,146.51

Total Cost per Unit: $12.92

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 468 - Lined Waterway or Outlet

Scenario: #5 - Concrete

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with concrete. 1/2 the channel is excavated, before excavation for concrete and subgrade material. Excess excavation is spoiled in the immediate area. Concrete is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, 6" of clean sand or gravel subgrade, and 5" reinforced concrete slab. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway. Usually installed in locations where rock or othe

After Situation:

Concrete lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated using a hydraulic excavator. Concrete slab is placed on 6" of clean sand or #57 stone. Concrete is placed, graded and screeded by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Foot

Scenario Typical Size: 4,500.0

Scenario Total Cost: $45,870.48

Total Cost per Unit: $10.19

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 468 - Lined Waterway or Outlet

Scenario: #8 - Plunge Pool - Rock

Scenario Description:

Install a 2 ft thick rock lined plunge pool that is 15 ' long, 10ft btm width, 2:1ss and 5' deep lined with riprap (D100 = 18", Velocity ~ 11 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 18" Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of outlet erosion. Situation is to difficult to handle with vegetative stabilization.

After Situation:

Rock lined plunge pool is 15 ' long, 10ft btm width, 2:1ss and 5' deep. Plunge area is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Cubic Yard of Rock Placed

Scenario Unit: Cubic Yard

Scenario Typical Size: 50.0

Scenario Total Cost: $9,868.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $197.37

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 468 - Lined Waterway or Outlet

Scenario: #16 - Rock Lined, 36 inch

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 18", Velocity ~ 11 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 18" Rock Riprap to a thickness of 36". Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:

Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Foot

Scenario Typical Size: 4,500.0

Scenario Total Cost: $86,699.75

Total Cost per Unit: $19.27

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 468 - Lined Waterway or Outlet

Scenario: #26 - Rock Lined, 12 inch

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 9", Velocity ~ 8 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 9" Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:

Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Foot

Scenario Typical Size: 4,500.0

Scenario Total Cost: $34,435.68

Total Cost per Unit: $7.65

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 468 - Lined Waterway or Outlet

Scenario: #27 - Concrete Block

Scenario Description:

Install 36' long (including inlet and outlet aprons) by 15' wide by 1.5' deep trapezoidal shaped waterway or chute lined with concrete blocks. 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. 8"x8"x16" standard concrete blocks are installed over 100% of the width of the waterway/chute to prevent scour. Cost include excavation, spoiling of excess material, 3" stone subgrade, geotextile and furnishing and installing standard concrete blocks. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway. Usually installed in locations where rock or othe

After Situation:

Concrete block lined waterway or chute is 36 ' long by 15' wide by 1.5' deep. Chute is installed on a 3 to 1 slope. The practice is installed using a hydraulic excavator. Geotextile and concrete blocks are installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Foot

Scenario Typical Size: 540.0

Scenario Total Cost: $4,241.49

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7.85

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 472 - Access Control

Scenario: #1 - Trail and or road closure

Scenario Description:

Restricting access to the use of forest/farm roads and trails by the use of a gate and limited fencing. Resource concerns include Undesirable plant productivity and health, Concentrated flow erosion, Soil compaction, Excessive sediment in surface waters, and Wildlife habitat degradation.

Before Situation:

Roads are damaged or misused, illegal activities occur and/or forest resources are at risk. Extensive amount of fencing (other than that needed to restrict access at the site of ingress) is not included in this scenario, but instead will be planned and in

After Situation:

Roads are protected, illegal activities are stopped and/or forest resources are secure.

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $846.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $846.83

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 472 - Access Control

Scenario: #2 - Animal exclusion from riparian zone

Scenario Description:

Livestock remain excluded by a fence from a riparian area that was previously grazed, in order to protect water quality. Monitoring occurs to ensure development of invasive plants or plants toxic to livestock is detected. In addition, monitoring occurs to ensure impacts of human access does not degrade natural resources. This is for facilitating exclusion of animals to protect or enhance natural resource values. Control will be established using the associated practice 382 Fencing. The primary resource concern is water quality; secondary concern: wildlife habitat. Other associated practices include: 390 Riparian Herbaceous Buffer and 391 Riparian Forest Buffer;

Before Situation:

Sensitive areas are threatened by the adverse actions of domestic and/or wild animals. The importance of the sensitive areas can include (but are not limited to): wildlife habitat, plant species composition, newly established trees and/or plants, stream b

After Situation:

Sensitive areas are protected from the adverse actions of domestic and/or wild animals by excluding them from the area.

Feature Measure: Area of Riparian zone

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $68.88

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $34.44

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 472 - Access Control

Scenario: #3 - Animal exclusion from other sensitive areas such as wetlands and sinkholes

Scenario Description:

Livestock remain excluded by a fence from springs, seeps, wetlands, tidal marsh areas, sinkholes or other similarly sensitive ecological site that was previously grazed, in order to protect water quality. Monitoring occurs to ensure development of invasive plants or plants toxic to livestock is detected. In addition, monitoring occurs to ensure impacts of human access does not degrade natural resources. This is for facilitating exclusion of animals to protect or enhance natural resource values. Control will be established using the associated practice 382 Fencing. The primary resource concern is water quality; secondary concern: wildlife habitat. Other associated practices include: 390 Riparian Herbaceous Buffer and 391 Riparian Forest Buffer;

Before Situation:

Sensitive areas are threatened by the adverse actions of domestic and/or wild animals. The importance of the sensitive areas can include (but are not limited to): wildlife habitat, plant species composition, newly established trees and/or plants, stream b

After Situation:

Sensitive areas are protected from the adverse actions of domestic and/or wild animals by excluding them from the area.

Feature Measure: Area with sensitive landscap

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $31.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $31.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 472 - Access Control

Scenario: #4 - Animal exclusion from woodland areas

Scenario Description:

Livestock remain excluded by a fence from woodlands sites that were previously grazed, in order to protect water quality. Monitoring occurs to ensure development of invasive plants or plants toxic to livestock is detected. In addition, monitoring occurs to ensure impacts of human access does not degrade natural resources. This is for facilitating exclusion of animals to protect or enhance natural resource values. Control will be established using the associated practice 382 Fencing. The primary resource concern is water quality; secondary concern: wildlife habitat. Other associated practices include: 390 Riparian Herbaceous Buffer and 391 Riparian Forest Buffer;

Before Situation:

Sensitive areas are threatened by the adverse actions of domestic and/or wild animals. The importance of the sensitive areas can include (but are not limited to): wildlife habitat, plant species composition, newly established trees and/or plants, stream b

After Situation:

Sensitive areas are protected from the adverse actions of domestic and/or wild animals by excluding them from the area.

Feature Measure: Wooded area

Scenario Unit: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $58.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.91

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 472 - Access Control

Scenario: #22 - Animal exclusion from sensitive areas

Scenario Description:

Excluding animals from an area in order to address identified resource concerns. This is for facilitating exclusion of animals to protect or enhance natural resource values. Control will be by temporary electric fencing. Any need for permanent fencing will be planned and installed using the Fence practice (382). Clearing of brush and trees is not necessary. Resource concerns include Wildlife Habitat degradation, Undesirable plant productivity and health, and/or Excessive sediment in surface waters.

Before Situation:

Sensitive areas are threatened by the adverse actions of domestic and/or wild animals. The importance of the sensitive areas can include (but are not limited to): wildlife habitat, plant species composition, newly established trees and/or plants, stream b

After Situation:

Sensitive areas are protected from the adverse actions of domestic and/or wild animals by excluding them from the area.

Feature Measure: Length of fence

Scenario Unit: Foot

Scenario Typical Size: 3,600.0

Scenario Total Cost: $702.58

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.20

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 472 - Access Control

Scenario: #34 - Trail/Road Access Control with hand tools

Scenario Description:
Restricting access to the use of forest/farm/garden roads and trails by the use of a gate and limited fencing. Resource concerns include undesirable plant productivity and health, concentrated flow erosion, soil compaction, and excessive sediment in surface waters.

Before Situation:
Roads or trails are damaged or misused, illegal activities occur, and/or forest/farm/garden resources are at risk. Extensive amount of fencing (other than that needed to restrict access at the site of ingress) is not included in this scenario, but instead

After Situation:
Road/trails are protected, illegal activities are stopped and/or forest/farm/garden resources are secure.

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $809.31

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $809.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 472 - Access Control

Scenario: #36 - Cave Gate

Scenario Description:
Installing a barred metal gate to exclude human access to sensitive cave species in a karst area. Access control is needed to treat the wildlife resource concern.

Before Situation:
The cave is currently unprotected from human access, and bats are susceptible to white nose syndrome infection. T&E bat species could easily be impacted by this fungus.

After Situation:
Sensitive cave species are protected from human traffic and fungal infection. Typical size is an 11'x15' gate assembly installed at the cave opening.

Feature Measure: average depth times averag

Scenario Unit: Square Foot

Scenario Typical Size: 165.0

Scenario Total Cost: $13,104.51

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $79.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 484 - Mulching

Scenario: #1 - Natural Material, Full Coverage

Scenario Description:
Application of straw mulch or other state approved natural material to reduce erosion and facilitate the establishment of vegetative cover. Mulch provides full coverage and is typically used with critical area planting. Assumes 125 bales/acre (3 bales/1000 sq ft)

Before Situation:
Typical scenario ranges from a 0.1 to 1.0 acre disturbed site around a newly constructed structural practice. The potential for soil erosion is high and mulch is needed to stabilize the soil and facilitate the establishment of vegetative cover.

After Situation:
Straw mulch has been applied to areas needing mulch. Erosion and sedimentation is reduced, water and soil quality is protected, and vegetative cover is established.

Feature Measure: Area Covered by Mulch

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $606.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $606.81

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 484 - Mulching

Scenario: #2 - Erosion Control Blanket

Scenario Description:

Installation of erosion control blanket on critical areas with steep slopes, grassed waterways or diversions.. Blanket is typically made of coconut coir, wood fiber, straw and is typically covered on both sides with polypropylene netting. Used to help control erosion and establish vegetative cover.

Before Situation:

There are areas of concentrated flow or very steep eroding areas needing a high level of erosion protection. Soil erosion is a concern and there is little to no vegetation.

After Situation:

The erosion control blanket is placed on concentrated flow or steep areas and secured with ground stables. Soil erosion is minimized and vegetative cover is established.

Feature Measure: Area Covered by Mulch

Scenario Unit: Square Foot

Scenario Typical Size: 5,000.0

Scenario Total Cost: $1,560.89

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 484 - Mulching

Scenario: #3 - Synthetic Material

Scenario Description:
Installation of geotextile, biodegradable plastic, polyethylene plastic, or other state approved synthetic mulch to conserve soil moisture, moderate soil temperature, and provide erosion control. Payment based on actual area covered by mulching material.

Before Situation:
Site conditions very. Typically scenarios include new tree and shrub plantings, irrigated orchards or vineyards, or annual and perennial specialty crops. Water quantity and soil moisture is a concern.

After Situation:
Synthetic mulch is applied in rows with a mulch layer or by other mechanized means. Soil moisture is conserved, energy use associated with irrigation is decreased.

Feature Measure: SF Covered by Mulch

Scenario Unit: Square Foot

Scenario Typical Size: 43,560.0

Scenario Total Cost: $7,264.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.17

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 484 - Mulching

Scenario: #4 - Tree and Shrub

Scenario Description:

Barrier fabric or other suitable natural or synthetic mulch is installed with a new tree and shrub planting to support establishment. Typically used during the installation of conservation practices. Rate is per tree/shrub and assumes 1 square yard of barrier fabric and 5 staples/tree.

Before Situation:

Site conditions vary. Typical scenario is an installation of 100 native trees and shrubs to enhance wildlife habitat. Sites are often remote and trees may not be planted in rows, requiring each tree to be mulched individually

After Situation:

Barrier fabric squares are installed with 5 sod staples each, around individual trees and shrubs to aid establishment. Weeds are controlled and soil moisture conserved to aid tree/shrub growth establishment.

Feature Measure: Number of Trees Mulched

Scenario Unit: Each

Scenario Typical Size: 100.0

Scenario Total Cost: $150.09

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.50

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 484 - Mulching

Scenario: #56 - Natural Material, Partial Coverage

Scenario Description:

Application of straw mulch or other state approved natural material (such as wood chips, compost, or hay) to reduce erosion, moderate soil temperature and suppress weeds. Typically used to provide partial coverage (either in-row or between rows) to suppress weeds. Payment based on total acres mulched, assuming 3-5 ft. swatch and 10-12 ft. row spacing.

Before Situation:

Site conditions vary. Typically scenarios include new tree and shrub plantings, irrigated orchards or vineyards, or annual and perennial specialty crops. Water quantity and soil moisture is a concern.

After Situation:

Implementation Requirements are prepared according to the 484 Mulching Standard and implemented. Straw or other natural mulch is applied in rows by hand or by mechanized means. Soil moisture is conserved, energy use associated with irrigation is decreased, and weed growth is suppressed.

Feature Measure: Total Acres Mulched

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,830.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $283.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #1 - Ground Applied Herbicide, Forestland

Scenario Description:

This practice involves the use of various herbicides applied using ground-based machinery in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. Typical sites include abandoned fields, pastures, agricultural fields or forestland that was recently harvested. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including herbaceous plants and woody vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target spec

After Situation:

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $4,599.76

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $114.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #2 - Aerial Applied Herbicide, Forestland

Scenario Description:

This practice involves the use of herbicides applied by fixed wing aircraft in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. This typical scenario includes open land such as abandoned fields, pastures or forestlands that were recently harvested. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition. Due to the potential for direct and off-site effects on wildlife and non-target plant species, and uncertainty about conservation benefits vs. support to production, ground based treatments are preferred. However, this scenario is allowed by policy, but should only be used where conservation benefits outweigh negative impacts and reasonable effort should be made and documented through the CPA-52 process to assure that this treatment will minimize off-site effects on wildlife and non-target plant species; and to assure that conservation is served and not just production.

Before Situation:

Undesirable vegetation is present on the site including herbaceous plants and woody competition. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target spe

After Situation:

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 40 acres.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $4,484.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $112.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #3 - Hand Applied Herbicide, Forestland

Scenario Description:

This practice involves the use of various herbicides applied using backpack sprayer or similar equipment, and hack-n-squirt for tree control, in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. Typical sites include lands such as old fields, pastures, rangelands, agricultural fields, previous forestlands that have been abandoned and are now covered with a mixture of grasses, forbs, shrubs and some remnant trees. Resource concerns are: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition.

Before Situation:

Undesirable vegetation, including woody and herbaceous plants, occupy 100 % of the site. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of

After Situation:

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 40 acres.

Feature Measure: area of treatment

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $5,599.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $139.98

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #4 - Rollerchop, Forest

Scenario Description:

This practice involves the use of a dozer pulling a roller chopper to treat an area in order to improve site conditions for establishing trees and/or shrubs. It could be used in conjunction with prescribed burning operations. Typical sites include 3-5 year old cut-over forest land with some trees and mostly brush cover that is not appropriate to the site or providing the desired condition for the landowner. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition and soil quality degradation - soil erosion - sheet and rill.

Before Situation:

The site is non stocked or inadequately stocked forestland to be reforested, dominated by undesirable vegetation including herbaceous plants and significant amounts of woody vegetation (trees and brush). There is also a significant component of woody debr

After Situation:

Undesirable vegetation has been removed reducing competition for target trees and/or shrubs. Woody debris has been removed to facilitate tree/shrub planting operations. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size is 40 acres.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $6,380.87

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $159.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #5 - Rollerchop and Spray, Forest

Scenario Description:

This practice involves the use of a dozer, roller chopper and ground applied herbicide to treat an area in order to improve site conditions for establishing trees and/or shrubs. It could be used in conjunction with prescribed burning operations. Typical sites include 3-5 year old cut-over forest land with some trees and mostly brush cover that is not appropriate to the site or providing the desired condition for the landowner. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition and soil quality degradation - soil erosion - sheet and rill.

Before Situation:

The site is non stocked or inadequately stocked forestland to be reforested, dominated by undesirable vegetation including herbaceous plants and significant amounts of woody vegetation (trees and brush). There is also a significant component of woody debr

After Situation:

Undesirable vegetation has been removed to reduce competition for target trees and/or shrubs. Woody debris has been removed to facilitate tree/shrub planting operations. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size is 40 acres.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $9,200.41

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $230.01

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #6 - Shear and Pile, Forest, Dozer

Scenario Description:

This practice involves the use of heavy machinery to treat an area in order to improve site conditions for establishing trees and/or shrubs. Typical sites include 1-5 year old cut-over forest land with trees and heavy brush cover that is not appropriate to the site or providing the desired condition for the landowner. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition and soil quality degradation - soil erosion - sheet and rill.

Before Situation:

The site is non stocked or inadequately stocked forestland to be reforested, dominated by undesirable vegetation including herbaceous plants and significant amounts of woody vegetation (trees and brush). There is also a significant component of woody debr

After Situation:

Undesirable vegetation has been removed using heavy mechanical methods like shearing and piling to reducing competition for target trees and/or shrubs. Woody debris has been removed to facilitate tree/shrub planting operations. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size is 40 acres.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $15,004.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $375.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #7 - Mow and Spray, NonForest

Scenario Description:

This practice involves the use of a tractor pulling bush hog mower and band sprayed herbicide to clear above ground vegetation and target plants in order to improve site conditions for establishing trees and/or shrubs. Typical sites include abandoned fields, pastures, and agricultural fields. This following resource concerns: soil quality degradation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including herbaceous plants and sparse woody competition. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of tar

After Situation:

Undesirable vegetation has been removed, thus enhancing the conditions for planting and survival of trees and/or shrubs. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $4,549.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $113.75

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #8 - Mow and Disk, NonForest

Scenario Description:

This practice involves the use of light/moderate machinery to clear above ground vegetation and to also rip/cut/lift underground root systems in order to improve site conditions for establishing trees and/or shrubs. Typical sites include abandoned fields, pastures, and over grown agricultural fields. This following resource concerns: soil quality degradation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including herbaceous plants and sparse woody competition. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of tar

After Situation:

Undesirable vegetation has been removed using a bush hog to knock down stand vegetation and heavy tillage equipment is used to breakup and lift root systems, breakup plow pans (<18" deep), thus enhancing the conditions for planting and survival of trees and/or shrubs. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 40 acres.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $4,800.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $120.01

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #9 - Spray, Cross Rip ARRI

Scenario Description:

Spray site with glyphosate product in the summer then mechanically treat proposed planting areas with 4 foot single shank ripper using a D9 dozer or equivalent on an 8 foot by 8 foot cross section to reduce soil compaction on previously reclaimed mine lands to improve conditions for tree and/or shrub plantings. Cross ripping of sloped area is done on the contour to minimize erosion. This scenario reflects work being done through the Appalachian Regional Reforestation Initiative (ARRI) . http://arri.osmre.gov/fra/advisories/fra_no.4.pdf

Before Situation:

Open area has compacted soils and undesirable vegetation due mine reclamation land shaping techniques that will negatively affect the survival and growth of newly planted trees and/shrubs. This practice is used to reduce soil compaction and competing vege

After Situation:

A previously mined site is sprayed with herbicide and cross ripped to alleviate compaction to allow the desired tree/shrub to be planted in the treated area. Resulting site is more conducive to tree/shrub growth because competition has been eliminated.

Feature Measure: Acreage treated

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $3,682.10

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $736.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #10 - Furrow or Scalp and spray

Scenario Description:
In a one pass operation prior to tree planting, furrow/scalp as shallow as possible (2-4) inches to lay aside undesirable thatch and vegetation, and broadcast apply pre-emergent herbicide, such as 2 oz. Oust and 4 oz. Arsenal per acre.

Before Situation:
Idle non-forest, open land with significant infestation of weeds that will compete with and reduce survival/growth of planted trees. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant p

After Situation:
Proposed planting area is free of competing vegetation and ready for tree planting. Reduction/removal of competing vegetation will improve the survival of trees planted.

Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $2,863.05

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $143.15

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #11 - Spray, Furrow or Scalp and Spray

Scenario Description:

In preparation for winter tree planting, perform 2 separate site preparation operations. 1. Broadcast spray proposed planting area in July-September with a non-selective herbicide, such as 8 quarts Razor and 4 ounces of Arsenal per acre. 2. In a one pass operation prior to tree planting, furrow/scalp as shallow as possible (2-4 inches) to lay aside undesirable thatch and vegetation and broadcast apply pre-emergent herbicide, such as 2 oz. Oust and 4 oz. Arsenal per acre.

Before Situation:

Idle, non-forest, open land with significant infestation of grass (species depending on location - bermudagrass, fescue, etc.) that will compete with and reduce survival/growth of planted trees. This practice is typically used to address the following res

After Situation:

Proposed planting area is free of competing grasses and ready for tree planting. Reduction/removal of competing grasses will improve survival/growth of planted trees. Typical scenario size - 20 acres.

Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $3,169.25

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $158.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #12 - Hand Scalp. 3 foot circles

Scenario Description:

Hand treating areas by scalping to bare ground to remove competing grasses/weeds to improve conditions for tree and/or shrub plantings. Work is completed by unskilled laborers. An area of approximately 3 feet in diameter is cleared of all competing grasses/weeds to allow the desired tree/shrub to be planted in the center of the cleared area. Typically at least 109 trees per acre (20' x 20' spacing).Work is typically completed with a rake or hoe. Resulting site is more conducive to tree/shrub growth because competition has been eliminated. Hand scalping is typically used in steep topography or in sensitive riparian sites where other mechanical and chemical means are not appropriate.

Before Situation:

Open area covered by grasses/weeds that will compete with the survival and growth of newly planted trees and/shrubs. This practice is used to replace plants that are not adapted or suited to the site based on landowner objectives or to augment poorly stoc

After Situation:

Resulting site is more conducive to tree/shrub growth because competition has been eliminated.

Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $351.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $351.79

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #17 - V-shear & Bed (single pass)

Scenario Description:

This practice involves the use of heavy machinery in order to improve site conditions for establishing trees and/or shrubs. Typical sites include 1-5 year old cut-over forest land with trees and heavy brush cover that is not appropriate to the site or providing the desired condition for the landowner. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition.

Before Situation:

The site is non stocked or inadequately stocked forestland to be reforested, dominated by undesirable vegetation including herbaceous plants and significant amounts of woody vegetation (trees and brush). There is also a significant component of woody debr

After Situation:

The site is non stocked or inadequately stocked forestland to be reforested, dominated by undesirable vegetation including herbaceous plants and significant amounts of woody vegetation (trees and brush). There is also a significant component of woody debris onsite. If left untreated, plant competition issues will result in poor survival or reduced growth of trees/shrubs to be established on the site.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $8,351.36

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $208.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #32 - Slash pulled to cover cut stumps to protect coppice regeneration

Scenario Description:

Treating an area of forest slash to improve the site for natural/coppice regeneration. Tops will be pulled over cut stumps to protect natural/coppice regeneration. Slash is treated by pulling tops over cut stumps with a dozer/skidder and operator. Resource concerns include: Degraded Plant Condition - Undesirable plant productivity and health, Inadequate structure and composition and Excessive plant pest pressure and Fish and Wildlife - Inadequate habitat, food, cover/shelter, habitat, continuity (space).

Before Situation:

Cut tops resulting from a silvicultural practice such as a timber harvest are left where they fall with no consideration for their ability to improve the site by protecting/promoting natural/coppice regeneration.

After Situation:

Cut tops are pulled over cut stumps, improving/protecting natural/coppice regeneration on the site. Improved regeneration establishes wildlife habitat, food, cover/shelter, habitat, continuity (space).

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,408.61

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $240.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #61 - Tree-Shrub Site Prep - small acreage

Scenario Description:

This practice involves the use of various chemical and tillage methods to allow for the planting of agroforestry practices and hedgerows. Site preparation includes chemically killing vegetation prior to mechanical site preparation that includes appropriate methods to allow for planting of the site which may include one or all of the following: ripping, disking, and harrowing. This practice may be applied on all lands needing treatment to facilitate establishment of trees and shrubs to facilitate establishment of agroforestry practices (alley cropping, forest farming, riparian forest buffer, silvopasture, and windbreak) and hedgerows. Resource concern: Soil erosion - wind erosion.

Before Situation:

Undesirable vegetation, including woody and herbaceous plants, is present on the site. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of tr

After Situation:

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and shrubs. Site conditions are favorable for successful establishment of trees and shrubs. The typical size is 0.5 acre.

Feature Measure: Area of treatment

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 22.0

Scenario Total Cost:	$431.89	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$19.63	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 500 - Obstruction Removal

Scenario: #4 - Removal and Disposal of Rock and or Boulders (Region)

Scenario Description:

Remove and disposal of rock and or boulders by drilling, blasting, demolition, excavation or other means required for removal. Dispose of all rocks and or boulders so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all rock and or boulders by removal to an approved location, or reuse location. Remove and dispose all rock and or boulders in order to apply conservation practices or facilitate the planned land use. Rocks and or boulders will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This

After Situation:

The typical area will be a 5.0 acre impaired area. The removal of rock and or boulders will be performed by drilling, blasting, demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all rocks and boulders from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 500.0

Scenario Total Cost: $6,846.45

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 500 - Obstruction Removal

Scenario: #5 - Removal and Disposal of Steel and or Concrete Structures

Scenario Description:

Remove and disposal of steel and or concrete structures by demolition, excavation or other means required for removal. Dispose of all steel and or concrete structures so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all steel and or concrete structures by removal to an approved location, or reuse location. Remove and dispose all steel and or concrete structures in order to apply conservation practices or facilitate the planned land use. Steel and or concrete structure removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This

After Situation:

The typical area will be a 2000 square feet of impaired land. The removal of steel and or concrete structures will be performed by demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all steel and or concrete structures from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Land Area

Scenario Unit: Square Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $32,163.96

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $16.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 500 - Obstruction Removal

Scenario: #6 - Removal and Disposal of Wood Structures

Scenario Description:

Remove and disposal of wood structures by demolition, excavation or other means required for removal. Dispose of all wood structures so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all wood structures by removal to an approved location, landfill, or reuse location. Remove and dispose all wood structures in order to apply conservation practices or facilitate the planned land use. Wood structure removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This

After Situation:

The typical area will be a 2000 square feet of impaired land. The removal of wood structures will be performed by demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all wood structures from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Land Area

Scenario Unit: Square Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $16,129.53

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 500 - Obstruction Removal

Scenario: #84 - Removal and disposal of light sand and flood sediment > 30 inches

Scenario Description:

Remove and disposal of > 30" of sand and flood deposited sediments by excavation or other means required for removal. Dispose of all sand and flood deposited sediments so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all sand and flood deposited sediments by removal to an approved location, or re-use location. Sand and/or silt removal will only address sand and/or silt obstructing farmland and cropland

Before Situation:

On any land where existing obstructions interfere with the return of land to its function prior to the occurrence of a natural disaster. The site may be recreation areas, farms, ranches, or other areas affected by natural disasters. This is not intended f

After Situation:

The typical area will be a 30 acre impaired area. The removal of sand and flood deposited sediments will be performed by excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all sand and flood deposited sediments from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: area covers by sediment gre

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $146,272.09

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,875.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 500 - Obstruction Removal

Scenario: #85 - Removal and disposal of heavy scattered debris

Scenario Description:

Removal of a heavy concentration of debris from farmland deposited by natural disaster. Includes the cost of all labor, equipment and disposal from area of debris. Debris is defined as woody material, rock, concrete, trash, and personal property deposited by natural disaster. This disposal shall be in accordance with all applicable Federal, State, and local laws, rules, and regulations. Dispose of all scattered debris so it does not impede farm operations or cause onsite or offsite damage. Dispose of all scattered debris by removal to an approved location, landfill, or reuse location. Scattered debris removal will only address debris obstructing farmland not in the footprint of a structure

Before Situation:

On any crop, farm or ranch land where debris from storm damage interfere with planned land use development, public safety or infrastructure. The site is covered with light debris, (wood, trees, metal, and other damage materials). Debris is scattered over

After Situation:

Scattered debris is removed from a affected area of the field.

Feature Measure: Area of debris

Scenario Unit: Square Foot

Scenario Typical Size: 12,000.0

Scenario Total Cost: $18,390.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.53

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 500 - Obstruction Removal

Scenario: #86 - Removal and disposal of light sand and flood sediment 12-30 inches

Scenario Description:

Remove and disposal of 12" to 30" of sand and flood deposited sediments by excavation or other means required for removal. Dispose of all sand and flood deposited sediments so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all sand and flood deposited sediments by removal to an approved location, or re-use location. Sand and/or silt removal will only address sand and/or silt obstructing farmland and cropland

Before Situation:

On any land where existing obstructions interfere with the return of land to its function prior to the occurrence of a natural disaster. The site may be cropland, farms, or ranches affected by natural disasters. This is not intended for the removal of obs

After Situation:

The typical area will be a 30 acre impaired area. The removal of sand and flood deposited sediments will be performed by excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all sand and flood deposited sediments from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: area covered by sediment

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $101,956.45

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,398.55

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 500 - Obstruction Removal

Scenario: #87 - Removal and disposal of light scattered debris

Scenario Description:

Removal of debris from farmland deposited by natural disaster. Includes the cost of all labor, equipment and disposal. Debris is defined as woody material, rock, trash, and personal property deposited by natural disaster. This disposal shall be in accordance with all applicable Federal, State, and local laws, rules, and regulations. Dispose of all scattered debris so it does not impede farm operations or cause onsite or offsite damage. Dispose of all scattered debris by removal to an approved location, landfill, or reuse location. Scattered debris removal will only address debris obstructing farmland not in the footprint of a structure

Before Situation:

On any crop, farm, or ranch land where debris from storm damage interfere with planned land use development, public safety or infrastructure. The site is covered with light debris, (wood, trees, metal, and other damage materials) on a percentage of the fi

After Situation:

Debris is removed from the field and land returned to prior use

Feature Measure: Area of debris scatter

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $5,103.57

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $510.36

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 500 - Obstruction Removal

Scenario: #88 - Removal and Disposal of Brush and Trees < 6 inch Diameter

Scenario Description:

Remove and disposal of brush and trees < 6 inches in diameter by demolition, excavation or other means required for removal. Dispose of all brush and trees so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all brush and trees by removal to an approved landfill, wood chipping and or land distribution, or recycling center, burial at an approved location or burning. If burning is used, implement appropriate smoke management to protect public health and safety. Remove and dispose of brush and trees in order to apply conservation practices or facilitate the planned land use. Brush and tree removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This

After Situation:

The typical area will be a 2.0 acre impaired area. The removal of brush and trees < 6 inch diameter will be performed with the use of equipment and hand labor. Dispose of all brush and trees from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Land Area

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $3,016.35

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,508.17

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 500 - Obstruction Removal

Scenario: #89 - Removal and Disposal of Brush and Trees > 6 inch Diameter

Scenario Description:

Remove and disposal of brush and trees > 6 inches in diameter by demolition, excavation or other means required for removal. Dispose of all brush and trees so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all brush and trees by removal to an approved landfill, wood chipping and or land distribution, or recycling center, burial at an approved location or burning. If burning is used, implement appropriate smoke management to protect public health and safety. Remove and dispose of brush and trees in order to apply conservation practices or facilitate the planned land use. Brush and tree removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This

After Situation:

The typical area will be a 2.0 acre impaired area. The removal of brush and trees > 6 inch diameter will be performed with the use of equipment and hand labor. Dispose of all brush and trees from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Land Area

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $4,972.74

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,486.37

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 500 - Obstruction Removal

Scenario: #90 - Removal and Disposal of Fence

Scenario Description:

Remove and disposal of all existing fences by demolition, excavation or other means required for removal. Dispose of all fence materials from the site so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all materials by removal to an approved landfill, wood chipping and land distribution, or recycling center, burial at an approved location or burning. If burning is used, implement appropriate smoke management to protect public health and safety. Remove and dispose of the unwanted fence obstruction in order to apply conservation practices such as Upland Wildlife Habitat Management (645) or facilitate the planned land use. Fence removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment and reduce hazards to wildlife.

Before Situation:

On any land where existing fence interferes with planned land use development, public safety, wildlife movement and habitat, or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected

After Situation:

The typical fence will be 2640 in linear feet. The removal of the fence will be performed with the use of equipment and hand labor. Dispose of all debris from the fence removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape such as Upland Wildlife Habitat Management (645).

Feature Measure: Length of Fence

Scenario Unit: Foot

Scenario Typical Size: 2,640.0

Scenario Total Cost: $3,718.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 500 - Obstruction Removal

Scenario: #91 - Removal and Disposal of Rock and or Boulders

Scenario Description:

Remove and disposal of rock and or boulders by drilling, blasting, demolition, excavation or other means required for removal. Dispose of all rocks and or boulders so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all rock and or boulders by removal to an approved location, or reuse location. Remove and dispose all rock and or boulders in order to apply conservation practices or facilitate the planned land use. Rocks and or boulders will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This

After Situation:

The typical area will be a 5.0 acre impaired area. The removal of rock and or boulders will be performed by drilling, blasting, demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all rocks and boulders from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 500.0

Scenario Total Cost: $73,003.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $146.01

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 511 - Forage Harvest Management

Scenario: #1 - Improved Forage Quality

Scenario Description:
Improved cultural practices and recordkeeping result in better forage quality and better livestock performance.

Before Situation:
Forage cutting heights are as close to the ground as equipment will allow resulting in very low stubble height. Plant regrowth is very slow. Forage quality tests are not regularly done. Records of forage quality components, cutting heights, moisture conte

After Situation:
Forage cutting heights are raised to leave at least 3-4" stubble height for cool season grasses and 6" - 8" (use a boot on the mower) for warm season grasses. Increased residual forage results in much faster plant regrowth. Forage quality tests are submitted to an accredited lab for analysis. Records of forage quality components, cutting heights, moisture content, and harvest schedule are regularly kept to track increased forage quality and improved livestock performance.

Feature Measure: Acreage of forage managed

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $96.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 511 - Forage Harvest Management

Scenario: #13 - Delayed Mowing for Wildlife

Scenario Description:

Delaying the harvest of the first cutting in perennial forage crops will benefit ground nesting birds. Research at the Smithsonian Conservation Biology Institute in Virginia showed that fledgling success for declining grassland songbirds can be greatly increased when the first harvest on a hayfield is delayed at least until late July. The delayed harvest results in a decrease in overall forage quality. Farmers could see as much as a 50% reduction in market value due to declines in protein (~50%) and digestibility (~20%), making the forage crop less palatable and lower in relative feed value. After the young have fledged, the field will be harvested for dry forages. Typical hayfield size 20 acres. Resource Concern INADEQUATE TERRISTRIAL HABITAT FOR WILDLIFE AND INVERTEBRATES – Quantity, quality or connectivity of food, cover, space and/or water is inadequate to meet requirements of identified terrestrial wildlife or invertebrate species.

Before Situation:

Perennial forage crops are produced and harvested throughout the nesting season; ground nesting birds are disturbed and/or fledgling birds are killed in the process.

After Situation:

Perennial crops are harvested with a delayed mowing until after the nesting season of the targeted ground nesting bird species or guild; forage quality is compromised; however, the survival of ground nesting birds is promoted. Typical hayfield size 20 acres.

Feature Measure: Increased grassland bird po

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $1,614.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $80.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 512 - Pasture and Hay Planting

Scenario: #1 - Native warm season grass

Scenario Description:

Establish or reseed adapted perennial native grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of native grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

After Situation:

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forage and Biomas

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $10,795.71

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $359.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 512 - Pasture and Hay Planting

Scenario: #3 - Native warm season grass mix

Scenario Description:

Establish or reseed adapted perennial native warm season grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable NWSG species are established to improve forage quality and quantity and reduce soil erosion on cropland, hayland, pasture and/or biomass production.

Feature Measure: Acres of Forage and Biomas

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $10,715.08

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $357.17

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 512 - Pasture and Hay Planting

Scenario: #4 - Native warm season grass mix, mined land

Scenario Description:

Establish or reseed adapted perennial native warm season grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Reclaimed mine land with low pH. Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable NWSG species are established to improve forage quality and quantity and reduce soil erosion on cropland, hayland, pasture and/or biomass production.

Feature Measure: Acres of Forage and Biomas

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $14,617.25

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $487.24

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 512 - Pasture and Hay Planting

Scenario: #6 - Warm season, introduced forage

Scenario Description:

Establish or reseed adapted introduced warm season grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forage and Biomas

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $10,424.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $347.49

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 512 - Pasture and Hay Planting

Scenario: #53 - Endophyte infect fescue conversion to native warm season grass mixture

Scenario Description:

Convert existing stand of endophyte-infected fescue stand to NWSGs to improve livestock nutrition and health and improve wildlife habitat values of the site. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings.

Before Situation:

Existing stand of endophyte-infected fescue grass provides poor nutrition to grazing livestock; poor wildlife habitat also. Resource concerns include undesirable forage quality and livestock health; may also include soil erosion and soil quality concerns.

After Situation:

Suitable NWSG species are established to improve forage quality, livestock nutrition and health as well as wildlife habitat. May also reduce soil erosion on cropland, hayland, pasture and/or biomass production.

Feature Measure: Acres of Forage and Biomas

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $3,810.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $381.04

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 512 - Pasture and Hay Planting

Scenario: #55 - Endophyte-infected fescue conversion to cool season grass and legume mixture

Scenario Description:

Establish a novel endophyte to improve livestock nutrition and health to improve wildlife habitat values of the site. Used for either conventional or no till seeding of perennial cool season grasses for pasture or hayland. PH assumed to need balancing with lime fertility needed.

Before Situation:

Existing stand of endophyte -infected fescue grass provides nutrition for grazing livestock: poor wildlife habitat also. Resource concerns include degraded plant conditions, undesirable plant productivity and health and livestock production limitation. In

After Situation:

Cool season grass and legume mixture established to improve livestock nutrition and health as well as improved ground cover, erosion control and wildlife habitat.

Feature Measure: Acres of Forage and Biomas

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $3,644.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $364.45

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 512 - Pasture and Hay Planting

Scenario: #90 - Introduced Cool Season Grasses with Legumes

Scenario Description:

Establish or reseed adapted perennial introduced cool season grasses and legumes to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding, and spreading.

Before Situation:

Poor or nonexistent stand of grass species. Resource concerns may include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Planting

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $11,646.66

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $388.22

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 512 - Pasture and Hay Planting

Scenario: #91 - Introduced Cool Season Grasses with Legumes with Low Input

Scenario Description:

Establish or reseed adapted perennial introduced cool season grasses and legumes to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertility and pH are not needed. Seed, equipment and labor for seed bed prep, tillage, seeding, and spreading are included.

Before Situation:

Poor or nonexistent stand of grass species. Resource concerns may include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Planting

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $4,452.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $148.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 512 - Pasture and Hay Planting

Scenario: #92 - Overseeding Legumes

Scenario Description:

Establishment of legumes for the purpose of increasing plant diversity, soil quality and fertility, and plant health and enhancing the quality of forage. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, seeding, and spreading. Mowing to be used to reduce light competition for overseeded legumes during germination.

Before Situation:

Existing stand of perennial grasses or monoculture with no legumes present.

After Situation:

Legumes will be maintained through proper grazing management and improve plant diversity and soil quality.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 30.0

Scenario Total Cost: $10,022.43

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $334.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 516 - Livestock Pipeline

Scenario: #1 - Buried Pipeline, all diameters

Scenario Description:

Description: Buried installation of PVC or HDPE (Iron Pipe Size & Tubing) pipeline. Scenario is for 1000 feet of 1½-inch, Sch 40 PVC, ASTM D1785 (0.52#/ft) or (SIDR-PR) ASTM D2239 (PE 3408) HDPE pipe weighs 0.43 lb./ft. Appurtenances include: couplings, fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 5% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pond (378), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of pipe

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $4,138.21

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.14

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 516 - Livestock Pipeline

Scenario: #2 - Surface Pipeline, all diameters

Scenario Description:

Description: Surface installation of PVC or HDPE (Iron Pipe Size & Tubing) pipeline. Scenario is for 1000 feet of 1½-inch, Class 200 (SDR-9.0, PE4708) HDPE pipe weighing 0.43 lb./ft. Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Pond (378), Watering Facility (614), and Water Harvesting Catchment (636). 5% added to pipe length for appurtenances.

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of pipe

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $2,330.87

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.33

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 516 - Livestock Pipeline

Scenario: #3 - Buried Pipeline in Rocky Terrain

Scenario Description:

Description: Buried installation of PVC or HDPE (Iron Pipe Size & Tubing) pipeline with 10% of line in rocky terrain. 1000 feet of 1½-inch, Sch 40 PVC, ASTM D1785 (0.52#/ft) or (SIDR-PR) ASTM D2239 (PE 3408) HDPE pipe weighs 0.43 lb./ft. Appurtenances include: couplings, fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 5% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), Pond (378) and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of Pipe

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $6,535.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.54

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 516 - Livestock Pipeline

Scenario: #4 - Rural water connection in steep topography with a Reduced Pressure Zone device

Scenario Description:

The rural water connection includes 60' of pipe, a Reduced Pressure Zone device (RPZ), all valves, and necessary installation for connecting from a rural water pipeline to a livestock distribution pipeline. This item includes installation, all materials, appurtenances, and labor required to construct and install meter box. This item does not include the hook-up fees to the rural water system. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636), Spring Development (574), and Prescribed Grazing (528).

Before Situation:

Inadequate water supply for domestic animals located on grazed range, pasture, or grazed forest in the northern plains region.

After Situation:

A rural water connection which provides access to a reliable, high quality water supply for meeting the needs of domestic animals on pasture. The meter, pipe and appurtenances will enable the pipeline to meet the quantity requirements of domestic animals.

Feature Measure: Rural water connection

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,459.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,459.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 516 - Livestock Pipeline

Scenario: #5 - Rural water connection without a Reduced Pressure Zone device

Scenario Description:

The rural water connection includes 60' of pipe, all valves, and necessary installation for connecting from a rural water pipeline to a livestock distribution pipeline. This item includes installation, all materials, appurtenances, and labor required to construct and install meter box. This item does not include the hook-up fees to the rural water system. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636), Spring Development (574), and Prescribed Grazing (528).

Before Situation:

Inadequate water supply for domestic animals located on grazed range, pasture, or grazed forest in the northern plains region.

After Situation:

A rural water connection which provides access to a reliable, high quality water supply for meeting the needs of domestic animals on pasture. The meter, pipe and appurtenances will enable the pipeline to meet the quantity requirements of domestic animals.

Feature Measure: Rural water connection

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,744.13

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,744.13

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 516 - Livestock Pipeline

Scenario: #6 - Freeze Proof Hydrant

Scenario Description:

Provide an adequate amount and quality of drinking water for livestock and address the associated resource concerns such as excessive nutrient buildup, grazing management, poor plant diversity and quality and soil/water quality. This scenario is for a pasture rotation or enhanced pasture management and utilization by installing freeze proof hydrants or quick connect couplers to support small portable water troughs (100 gallon) which provide a water supply. Because the system does not flow continuously a float is needed to maintain the water level within the portable trough. Trough is moved from paddock to paddock as needed.

Before Situation:

The setting takes place where livestock have open access to existing natural water supplies and/or poor grazing mgt. results in: poor water quality from soil erosion and manure deposit, poor grazing distribution and plant health, overgrazing, poor manure

After Situation:

Improved: water/soil quality, grazing management, plant diversity and quality, manure distribution, water quality, and animal health. A hydrant is located in the pasture and is protected from trampling by a wooden post. A portable heavy duty polyethylene trough is part of an intensive rotational grazing management system. The trough is connected to a water supply system via quick coupler or frost free hydrant. The trough is secured to wooden posts to prevent overturning.

Feature Measure: Number of Freeze Proof Hy

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $264.72

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $264.72

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #34 - Soil Dispersant - Uncovered

Scenario Description:

Construction of a compacted soil liner, treated with a soil dispersant, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the dispersant with the soil liner under proper moisture conditions and compaction to the designed liner thickness. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with dispersants.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Liner Material

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,613.0

Scenario Total Cost: $11,700.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7.25

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #35 - Soil Dispersant - Covered

Scenario Description:

Construction of a compacted soil liner, treated with a soil dispersant, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the dispersant with the soil liner under proper moisture conditions, compaction to the designed liner thickness, and placement of soil cover over the treated liner. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with dispersants.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Liner Material inc

Scenario Unit: Cubic Yard

Scenario Typical Size: 3,226.0

Scenario Total Cost: $18,248.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.66

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #36 - Bentonite Treatment - Uncovered

Scenario Description:

Construction of a compacted soil liner, treated with bentonite, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the bentonite with the soil under proper moisture conditions, compaction to the designed liner thickness. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with dispersants.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Liner Material

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,613.0

Scenario Total Cost: $278,695.97

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $172.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #37 - Bentonite Treatment - Covered

Scenario Description:

Construction of a compacted soil liner, treated with bentonite, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the bentonite with the soil under proper moisture conditions, compaction to the designed liner thickness, and placement of soil cover over the treated liner. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with bentonite.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Liner Material (in

Scenario Unit: Cubic Yard

Scenario Typical Size: 3,227.0

Scenario Total Cost: $285,248.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $88.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #38 - Material haul < 1 mile

Scenario Description:

Construction of a compacted soil liner, treated with compacted clay, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and soil cover to protect the finished liner. Material haul < 1 mile. Associated practices include PS378, PS313, & other waste water impoundments.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a clay liner without amendments is available at an economical haul distance. Material haul < 1 mile.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Liner Material (in

Scenario Unit: Cubic Yard

Scenario Typical Size: 2,420.0

Scenario Total Cost: $28,367.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11.72

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #39 - Material haul > 1 mile

Scenario Description:

Construction of a compacted soil liner, treated with compacted clay, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and protection of the finished liner. Material haul > 1 mile. Associated practices include PS378, PS313, & other waste water impoundments.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a clay liner without amendments is available at an economical haul distance.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Liner Material (in

Scenario Unit: Cubic Yard

Scenario Typical Size: 2,420.0

Scenario Total Cost: $34,503.31

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $14.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

Scenario: #1 - Flexible Membrane - Uncovered without liner drainage or venting

Scenario Description:
Installation of a flexible geosynthetic membrane liner, uncovered, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes a geotextile or soil cushion to protect the liner from subgrade damage. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

Before Situation:
In-place soils at site exhibit seepage rates in excess of acceptable limits.

After Situation:
Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Surface area of Liner Materi

Scenario Unit: Square Yard

Scenario Typical Size: 2,420.0

Scenario Total Cost: $26,856.84

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11.10

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

Scenario: #2 - Flexible Membrane - Uncovered with liner drainage or venting

Scenario Description:
Installation of a flexible geosynthetic membrane liner, uncovered, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes a geotextile or soil cushion to protect the liner from subgrade damage, and liner drainage or venting. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

Before Situation:
In-place soils at site exhibit seepage rates in excess of acceptable limits.

After Situation:
Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Surface area of Liner Materi

Scenario Unit: Square Yard

Scenario Typical Size: 2,420.0

Scenario Total Cost: $51,668.82

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $21.35

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

Scenario: #3 - Flexible Membrane - Covered without liner drainage or venting

Scenario Description:
Installation of a flexible geosynthetic membrane liner to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes 1 foot of soil cover for liner protection, and a geotextile or soil cushion to protect liner from subgrade damage. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

Before Situation:
In-place soils at site exhibit seepage rates in excess of acceptable limits.

After Situation:
Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Surface area of Liner Materi

Scenario Unit: Square Yard

Scenario Typical Size: 2,420.0

Scenario Total Cost: $30,133.05

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12.45

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

Scenario: #4 - Flexible Membrane - Covered with liner drainage or venting

Scenario Description:
Installation of a flexible geosynthetic membrane liner to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes 1 foot of soil cover for liner protection, a geotextile or soil cushion to protect liner from subgrade damage, and liner drainage or venting. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

Before Situation:
In-place soils at site exhibit seepage rates in excess of acceptable limits.

After Situation:
Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Surface area of Liner Materi

Scenario Unit: Square Yard

Scenario Typical Size: 2,420.0

Scenario Total Cost: $54,945.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $22.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 522 - Pond Sealing or Lining - Concrete

Scenario: #4 - Concrete liner, non-reinforced

Scenario Description:

Construction of a non-reinforced concrete liner to reduce seepage losses from ponds or waste storage impoundment structures. A non-reinforced concrete liner is intended to be used where liquid tightness is not required. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated Practices: Pond (378), Waste Storage Facility (313), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Waste Separation Facility (632), Waste Treatment (629), Subsurface Drain (606), Underground Outlet (620), Pumping Plant (533).

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits and construction of a compacted soil liner is not feasible with available soils.

After Situation:

Water conservation and environmental protection provided by reducing seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Concrete liner

Scenario Unit: Cubic Yard

Scenario Typical Size: 278.0

Scenario Total Cost: $80,892.09

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $290.98

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 522 - Pond Sealing or Lining - Concrete

Scenario: #5 - Concrete liner, reinforced

Scenario Description:

Construction of a reinforced concrete liner to reduce seepage losses from ponds or waste storage impoundment structures. A reinforced concrete liner is intended to be used where liquid tightness is required. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated Practices: Pond (378), Waste Storage Facility (313), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Waste Separation Facility (632), Waste Treatment (629), Subsurface Drain (606), Underground Outlet (620), Pumping Plant (533).

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits and construction of a compacted soil liner is not feasible with available soils.

After Situation:

Water conservation and environmental protection provided by reducing seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Concrete Liner

Scenario Unit: Cubic Yard

Scenario Typical Size: 347.0

Scenario Total Cost: $189,877.16

Total Cost per Unit: $547.20

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 527 - Sinkhole Treatment

Scenario: #1 - Sinkhole Treatment

Scenario Description:

Installing a sinkhole protection cap on a circular sinkhole with a vertical opening. The area around a sinkhole may be unstable and slippage or subsidence may occur. Sinkholes present fall hazards to people and livestock. Sinkholes are direct conduits to groundwater. Nutrient or chemical laden runoff may flow directly into sinkholes polluting groundwater. Sinkholes are routinely used for waste pits by landowners. Critical Area Planting (342), Fence (382), Vertical Drain (630), Obstruction Removal (500) & Filter Strips (393) may be associated practices for this scenario.

Before Situation:

Open sinkhole poses threat to people, livestock, & wildlife. Absence of buffer allows nutrients and chemicals to flow into the open sinkhole untreated. Trash & Debris have accumulated in the sinkhole from years of use as a waste pit. Typical Sinkhole trea

After Situation:

Debris removed and properly disposed of off site. The sinkhole protection cap installation resolves the safety issue for people, livestock, & wildlife. The sinkhole is filled with porous material so as not to disrupt the hydrology of the karst system while filtering runoff. For this scenario, the sinkhole is assumed to be 5' deep. An inverted filter consisting of 1.5' of riprap and 2' of aggregate capped by 1.5' of compacted soil will be used. The gravel will be covered with geotextile fabric to prevent loss of soil. The concrete is removed from the components because the filter is supposed to be porous. The pipe is removed to avoid creating a direct conduit into the sinkhole. For practice units: total of 94 CY x 27 = 2538 CF

Feature Measure: Cubic Foot of Treatment

Scenario Unit: Cubic Foot

Scenario Typical Size: 2,538.0

Scenario Total Cost: $9,579.91

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.77

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 527 - Sinkhole Treatment

Scenario: #2 - Debris removal and proper disposal

Scenario Description:

Removing and properly disposing of debris. Sinkholes present fall hazards to people and livestock. Sinkholes are direct conduits to groundwater. Nutrient or chemical laden runoff may flow directly into sinkholes polluting groundwater. Sinkholes are routinely used for waste pits by landowners. Critical Area Planting (342), Fence (382), Vertical Drain (630), Obstruction Removal (500) & Filter Strips (393) may be associated practices for this scenario.

Before Situation:

Open sinkhole poses threat to people, livestock, & wildlife. Absence of buffer allows nutrients and chemicals to flow into the open sinkhole untreated. Trash & Debris have accumulated in the sinkhole from years of use as a waste pit. Typical Sinkhole trea

After Situation:

Debris removed and properly disposed of off site. Associated practices to be used include 382 Fencing, 390 Riparian Herbaceous Buffer or 391 Riparian Forest Buffer or 393 Filter Strip to create a setback around the sinkhole.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,564.15

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,564.15

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 528 - Prescribed Grazing

Scenario: #1 - Pasture Standard

Scenario Description:

Design and implementation of a grazing system that will enhance pasture condition and ecosystem function as well as optimize efficiency and economic return through monitoring (Ex: photo points, stubble height after grazing, etc.) & record keeping.

Before Situation:

Current grazing system exhibits undesirable and inefficient use of forage plants and such use may have a negative impact on pasture condition, as well as soil and water resources. Stocking rates are likely higher than the current level of production and e

After Situation:

Prescribed grazing system is designed to improve the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances pasture condition and function through protection of sensitive areas, and efficient harvest of forage resources. Grazing system success will be evaluated through short term monitoring. Associated Practices: Brush Management (314), Herbaceous Weed Control (315), Pond (378), Fence (382), Access Control (472), Pasture and Hayland Planting (512), Livestock Pipeline (516), Spring Development (574), Animal Trails and Walkways (575), Stream Crossing (578), Nutrient Management (590), Feed Management (592), Watering Facility (614), Water Well (642).

Feature Measure: Area of grazed pasture

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost:	$2,131.40	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$53.28	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 528 - Prescribed Grazing

Scenario: #2 - Pasture Intensive

Scenario Description:

Design and implementation of a grazing system that will enhance pasture condition and ecosystem function as well as optimize efficiency and economic return through monitoring (ex: trend, composition, production, etc.), record keeping.

Before Situation:

Current grazing system exhibits undesirable and inefficient use of forage plants and such use may have a negative impact on pasture condition, as well as soil and water resources. Stocking rates are likely higher than the current level of production and e

After Situation:

Prescribed grazing system is designed to improve the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances pasture condition and function through proper rest and recovery periods, protection of sensitive areas, proper utilization, and efficient harvest of forage resources. Grazing system success will be evaluated through long term monitoring. Associated Practices: Brush Management (314), Herbaceous Weed Control (315) Pond (378), Fence (382), Access Control (472), Pasture and Hayland Planting (512), Pipeline (516), Spring Development (574), Animal Trails and Walkways (575), Stream Crossing (578), Nutrient Management (590), Feed Management (592), Watering Facility (614), and Water Well (642).

Feature Measure: Area of grazed pasture

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,943.95

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $98.60

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 528 - Prescribed Grazing

Scenario: #19 - Pasture Deferment

Scenario Description:

Defer the pasture for 90 days and up to a growing season to manage for invasive weeds when necessary, to improve the health of the plants and/or provide nesting habitat for wildlife species. Keep records of dates out and monitor to determine when desired objectives of deferment are met.

Before Situation:

Over-grazed pasture, a pasture with a low condition score, or a newly established pasture converted from cropland with a need for proper grazing management.

After Situation:

Improve the health and vigor of the sward, through deferment of grazing and improve the nesting habitat for wildlife.

Feature Measure: <Unknown>

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $764.65

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 528 - Prescribed Grazing

Scenario: #21 - Stockpiling Forage for Extended Grazing

Scenario Description:

Livestock are excluded from forages during late summer and fall months (approx. 90 days). The stockpiled forages are grazed at a later time using strip grazing to allow animals to utilize the forage within the strip for a specified period of time and thereby extending the grazing season. Resource Concerns include: DEGRADED PLANT CONDITION: Undesirable plant productivity and health, DEGRADED PLANT CONDITION – Inadequate structure and composition, LIVESTOCK PRODUCTION LIMITATION: Inadequate feed and forage, WATER QUALITY: Excess nutrients in surface water INEFFICIENT ENERGY USE - Equipment and Facilities/Farming/Ranching Practices, SOIL CONDITION - Organic Matter Depletion, SOIL EROSION - Sheet and Rill

Before Situation:

Pasture and/or hayland (cropland) - Current implementation of a grazing plan does not allow for extending the grazing season. Annual forage production is insufficient causing the producer to begin supplemental feeding earlier in the year and concentrating

After Situation:

Managing grazing land to stockpile forages for later use extends the grazing season and promotes a move to yearlong grazing. Stockpiling also provides long term grass sustainability and improved forage health resulting in higher quality forage for livestock. Eliminating a minimum of one hay cutting reduces fuel use, labor and erosion potential. Water quality is improved because manure is more evenly distributed throughout the pasture as livestock graze and nutrient loading at hay feeding sites, if needed, is reduced. Typical Scenario Size - 20 acres

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $764.20

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $38.21

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 528 - Prescribed Grazing

Scenario: #51 - Prescribed Grazing Management, 5 acres or less

Scenario Description:
Plan, implement and monitor a rotational grazing system that will enhance and maintain ecosystem function as well as optimize efficiency and economic return on small farm (5 acres or less) grazing lands.

Before Situation:
Area is degraded due to inappropriate timing, duration, frequency and intensity of animal utilization resulting in impaired ecosystem functions. Overuse and degradation of the soil and plant resources are occurring and animal health is compromised.

After Situation:
Planned rotational movement of animals meet ecosystem functions due to proper timing, duration, frequency and intensity of animal utilization. Monitoring is showing that animals are in balance with available forage resources and ecological function and processes for soil, water and plant resources are being improved.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $1,315.87

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $263.17

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #1 - Electric-Powered Pump <= 1.5 HP, Not Installed in a Well

Scenario Description:

Typical application of a less than or equal to 1.5 HP electric-powered pump, not installed in a well, in order to pump water to appropriate locations within the prescribed grazing system. Pump enables the development of new watering sites that are removed from hydrologically sensitive areas and provide for a better distribution of animal wastes and associated nutrients. Cattle exclusion from surface water results in improved surface water quality, reduced erosion. Also used for pressurizing a small irrigation system; or for transferring liquid waste in a waste transfer system. Scenario typically includes a pressure tank. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.

Before Situation:

Livestock: A pump is needed to move water to provide proper flow rate for watering facility which is used as part of a prescribed grazing system.

After Situation:

A 1 HP pump is installed at water source in order to pump water to appropriate locations within the prescribed grazing system. Pump enables the development of new watering sites that are removed from hydrologically sensitive areas and provide for a better distribution of animal wastes and associated nutrients. Cattle exclusion from surface water results in improved surface water quality, reduced erosion. Associated practices: Waste Storage Facility (313), Pond (378), Irrigation Pipeline (430), Irrigation System, Microirrigation (441), Livestock Pipeline (516), Spring Development (574), Watering Facility (614), Waste Transfer (634), and Water Well (642).

Feature Measure: Pump

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,716.34

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,716.34

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #4 - Electric-Powered Pump >1.5 HP and <= 5 HP with Pressure Tank

Scenario Description:

The typical scenario supports replacement of an electric-powered pump in an existing micro irrigation system on cropland using a typical 4 HP electric-powered pump with a pressure tank. Size of pump is determined by required GPM derived from a design for specific irrigation system on cropland. Scenario could also be used for a 4 HP for silage leachate, barnyard runoff, and milkhouse waste (as part of a waste transfer system) at farm headquarters. Irrigation Setting: existing micro irrigation system employs an inefficient, improperly sized pump that leads to inefficient water delivery resulting in high energy costs; or Waste Transfer Setting: various types of liquid waste at the headquarters is uncollected causing surface and ground water issues. Due to topography, gravity transfer is not possible, and a properly sized pump is needed to transfer waste as part of a waste transfer system. Also, can be used as Livestock Water Pump for systems requiring larger than 1.5 HP with a pressure tank.

Before Situation:

Irrigation Setting: existing micro irrigation system employs an inefficient, improperly sized pump that leads to inefficient water delivery resulting in high energy costs; or Waste Transfer Setting: various types of liquid waste at the headquarters is unc

After Situation:

Irrigation Setting: For micro irrigation system, a properly designed pump is installed reducing water and energy usage. Waste Transfer Setting: For liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities. Associated practices: Waste Transfer (634), Irrigation Pipeline (430), Irrigation System, Micro-Irrigation (441), Heavy Use Area Protection (561), Irrigation Water Management (449),Waste Storage Facility (313), Vegetated Treatment Area (635)

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 4.0

Scenario Total Cost: $7,774.85

Total Cost per Unit: $1,943.71

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #5 - Electric-Powered Pump >5 and <= 10 HP

Scenario Description:

The typical scenario supports replacement of an electric-powered pump in an existing irrigation system (includes backflow prevention device or water meter as appropriate) on cropland with a typical 8 HP permanent pump. Size of pump is determined by required GPM derived from a design for specific irrigation system on cropland. Scenario could also be used for an 8 HP pump for silage leachate, barnyard runoff, and milkhouse waste (as part of a waste transfer system) at farm headquarters. The combination of higher solids content and volume require a larger horse power pump. This liquid manure pump is used to transfer semi-solid manure from a small reception pit located either below a barnyard or at the end of a free-stall barn or scrape alley.

Before Situation:

Irrigation Setting: Either an existing irrigation system employs an inefficient, improperly sized pump that leads to inefficient water delivery resulting in high energy costs; or Waste Transfer Setting: various types of semi-solid or liquid waste at the h

After Situation:

Irrigation Setting: For irrigation system, a properly designed electric-powered pump is installed reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible, and a properly sized pump is needed to transfer waste as part of a waste transfer system. Associated practices: Waste Transfer (634), Irrigation Pipeline (430), Irrigation System, Micro-Irrigation (441), Heavy Use Area Protection (561), Irrigation Water Management (449), Waste Storage Facility (313), Vegetated Treatment Area (635)

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 8.0

Scenario Total Cost: $9,969.31

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,246.16

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #6 - Electric Powered Pump >10 and <= 30 HP

Scenario Description:

This is a close-coupled, 3-phase, 15 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a medium-sized (600 gpm and 50 psi) sprinkler or large microirrigation (850 gpm and 35 psi) system or a large-sized surface irrigation system (1,200 gpm) or a large-sized (1,200 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Before Situation:

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use. Waste Transfer: Various types of semi-solid or liquid waste are uncollected caus

After Situation:

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency. Waste Transfer: Collected wastes are now efficiently transferred to an appropriate treatment or storage facility or to a distribution system.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 15.0

Scenario Total Cost: $18,912.90

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,260.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #7 - Electric-Powered Pump >30 and <=75 HP

Scenario Description:

This is a close-coupled, 3-phase, 50 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a large-sized (1,200 gpm and 50 psi) sprinkler or very large microirrigation (1,700 gpm and 35 psi) system or a very large-sized surface irrigation system (2,800 gpm) or a very large-sized (2,400 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

Before Situation:

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

After Situation:

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 50.0

Scenario Total Cost: $32,987.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $659.76

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #90 - Electric-Powered Pump <= 1.5 HP in a well

Scenario Description:

Typical application of a less than or equal to 1.5 HP electric-powered pump in a well in order to pump water to appropriate locations within the prescribed grazing system. Cattle exclusion from surface water results in improved surface water quality, reduced erosion. Also used for pressurizing a small irrigation system. Scenario typically includes a pressure tank. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.

Before Situation:

Livestock: A pump is needed to move water to provide proper flow rate for watering facility which is used as part of a prescribed grazing system.

After Situation:

A 1 HP electric-powered pump is installed in a well in order to pump water to appropriate locations within the prescribed grazing system. Cattle exclusion from surface water results in improved surface water quality, reduced erosion. Associated practices: Irrigation Pipeline (430), Irrigation System, Microirrigation (441), Livestock Pipeline (516), Watering Facility (614), and Water Well (642).

Feature Measure: Pump

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $5,931.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,931.81

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #148 - Electric-Powered Pump >1.5 HP and <= 5 HP without a Pressure Tank

Scenario Description:

Typical application of an electric-powered pump greater than 1.5 HP and less than or equal to 5 HP installed in a well or structure; or a close-coupled electric-powered centrifugal pump mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a small irrigation system; or for transferring liquid waste in a waste transfer system. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.

Before Situation:

Livestock: The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system. Irrigation: Available water is at an insufficient pressure to allow for even distribution of water. Waste Transfer: Contaminated wate

After Situation:

Livestock: Water is transferred with an electric-powered 2.5 HP pump without a pressure tank with at a sufficient rate and pressure to meet the requirements of a prescribed grazing system. Irrigation: A properly designed electric-powered 2.5 HP pump without a pressure tank is installed to improve irrigation efficiency and reduce energy usage. Waste Transfer: Liquid wastes that have been collected through a waste transfer system are now efficiently transferred to an appropriate treatment or storage facility. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 2.5

Scenario Total Cost: $3,907.38

Total Cost per Unit: $1,562.95

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #152 - Electric-Powered Pump >75

Scenario Description:

This is a close-coupled, 3-phase, 100 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a very large (2500 gpm and 50 psi) sprinkler or a large-sized surface irrigation system (3,000 gpm). Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

Before Situation:

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

After Situation:

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 100.0

Scenario Total Cost: $43,019.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $430.20

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #153 - Variable Frequency Drive

Scenario Description:

This is an installation of electrical and electronic components designed to vary the frequency of the voltage to an electric motor and thus the ability to vary the speed of the motor. This directly affects pressure and flowrate. This also could give the operator the flexibility to operate several systems separately or at the same time. Resource concerns: Insufficient water - Inefficient use of irrigation water; Inefficient energy use - Equipment and facilities and Farming/ranching practices and field operations. Associated Practices: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; and 614 - Watering Facility.

Before Situation:

Standard electrical connection from electrical utility to pump motor. No capability to match pump output pressure and/or flowrate to field(s) need(s). Result is over/under pressure(s) and/or flow rate(s), possible hydraulic anomalies, energy loss, and or

After Situation:

VFD Modifications are implemented at the pump site to allow for varying the speed of a 40 Hp electric motor to match the pressure and flow requirements for a center pivot irrigation system.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 50.0

Scenario Total Cost: $6,904.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $138.10

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #154 - Internal Combustion-Powered Pump <= 50HP

Scenario Description:

The typical scenario supports installation of a pump in an existing irrigation system or installation of a new pump on cropland with a 30 BHP pump. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. The combination of higher solids content and volume require a larger horse power pump. This liquid manure pump is used to transfer semi-solid manure from a small reception pit located either below a barnyard or at the end of a free-stall barn or scrape alley. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; 436 - Irrigation Reservoir; and 447 - Irrigation System, Tailwater Recovery; and 614 - Watering Facility.

Before Situation:

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or Waste Transfer: various types of semi-solid or liquid waste at the headquarters is u

After Situation:

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 30.0

Scenario Total Cost: $28,009.33

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $933.64

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #155 - Internal Combustion-Powered Pump > 50 to 70 HP

Scenario Description:

The typical scenario supports installation of a pump in an existing irrigation system or installation of a new pump on cropland with a 60 BHP pump. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. The combination of higher solids content and volume require a larger horse power pump. This liquid manure pump is used to transfer semi-solid manure from a small reception pit located either below a barnyard or at the end of a free-stall barn or scrape alley. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; 436 - Irrigation Reservoir; and 447 - Irrigation System, Tailwater Recovery; and 614 - Watering Facility.

Before Situation:

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or Waste Transfer: various types of semi-solid or liquid waste at the headquarters is u

After Situation:

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 60.0

Scenario Total Cost: $45,346.40

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $755.77

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #156 - Internal Combustion-Powered Pump > 70 HP

Scenario Description:

The typical scenario supports replacement of a pump in an existing irrigation system or installation of a new pump on cropland that is 75 break HP pump or larger. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. Scenario could also be used for a pump for silage leachate, barnyard runoff, and milk house waste (as part of a waste transfer system) at farm headquarters. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Before Situation:

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or Waste Transfer: various types of semi-solid or liquid waste at the headquarters is u

After Situation:

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 100.0

Scenario Total Cost: $69,904.33

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $699.04

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #157 - Tractor Power Take Off (PTO) Pump

Scenario Description:

This scenario involves a PTO driven pump to either transfer water for an irrigation system from a Pond - 378 (includes backflow prevention as appropriate) to cropland or; to transfer semi-solid/ liquid manure (as part of a waste transfer system) at the farm headquarters from a Waste Storage Facility - 313, to an irrigation system or waste treatment facility. In both cases, a PTO driven pump is selected because the landowner has equipment available to supply power to the pump. Electricity is not readily available and/or a stationary engine is not a practical alternative. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 430 - Irrigation Pipeline; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 590 - Nutrient Management; 378 - Pond; 313 - Waste Storage Facility; and 634 - Waste Transfer.

Before Situation:

Irrigation Setting: An existing surface irrigation system employs an inefficient, improperly sized pump that leads to inefficient water delivery resulting in high energy costs; Waste Transfer Setting: various types of semi-solid or liquid waste at the hea

After Situation:

Irrigation Setting: A properly designed PTO-driven pump is installed, to transfer water to an Irrigation Pipeline (430) or Irrigation Canal or Lateral (320). Waste Transfer Setting: Wastes that have been collected through a waste transfer system are now efficiently transferred from a Waste Storage Facility (313) to an appropriate treatment facility or to an irrigation system. The pump typically will move 2,000 gallons per minute and is portable so that it can be used at several locations.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 60.0

Scenario Total Cost: $10,836.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $180.61

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #158 - Windmill-Powered Pump

Scenario Description:

A windmill is installed in order to supply a reliable water source for livestock and/or wildlife. The windmill includes the tower, concrete footings, wheel blade unit, sucker rod, down pipe, gear box, pump, plumbing, and well head protection concrete pad. The typical scenario will be a windmill system with a 10 ft diameter mill and 27-foot tower which is pumping from a 150-foot well. As a result of installing this windmill, resource concerns of inadequate stock water, plant establishment, growth, productivity, health, and vigor, and water quantity can be addressed. Resource Concerns: Insufficient stockwater.

Before Situation:

In a rangeland or pasture setting, a reliable source of water for livestock is not available, or the spacing between water sources is such that grazing distribution and plant health are adversely impacted.

After Situation:

A windmill, with a wheel ranging from 6' to 16' in diameter, will be installed over a well that is located to provide a reliable source of livestock water at the rate of at least 2 gpm, to facilitate proper grazing distribution and improved plant health. To increase reliability, water is pumped into a storage tank to provide a given number of days of supply. Installation includes the footings, wellhead protection concrete pad, tower, gear box, sail, sucker rod, down hole accessories, and a short outlet pipe to a storage tank.

Feature Measure: Diameter of Mill Wheel

Scenario Unit: Foot

Scenario Typical Size: 10.0

Scenario Total Cost: $14,004.99

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,400.50

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #159 - Water Ram Pump

Scenario Description:

A water ram is used to transfer water from a live stream to a Watering Facility (614) or small Irrigation Reservoir (436) utilizing the energy of moving water to transfer a portion of that water to a higher elevation. It is anchored to a small concrete pad. Bypass water (which could easily be 90% of the water diverted from the stream) is returned to the stream or transferred in a pipe, to a lower elevation tank (614 or 436), without erosion or impairment to water quality. In the livestock scenario, the objective is to provide water to the cattle outside of a live stream or other natural water source thereby eliminating a significant erosion situation while also improving water quality. The cattle thus have access to drinking water without having to enter the stream. The water ram may need to be fenced for protection from curious bovines. While it is generally not considered practical for irrigation, in the irrigation scenario, water can be retrieved from a stream and stored in a small 436 to provide water for a very small (0.1 acre) irrigation system. Resource Concerns: Insufficient stockwater. Associated Practices: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Water in a nearby stream is not available at the desired location, pressure and/or flow rate.

After Situation:

A 2" diameter inlet pipe is installed and connected to a water ram pump with all appurtenances and anchored to a concrete pad (9 ft x 4 ft x 5 in) or other appropriate secure base. Depending upon the application, either a 1-inch diameter Livestock Pipeline (516) or an Irrigation Pipeline (430) is installed from the water ram to a 5,000 gallon storage facility. Improved water quantity or quality, grazing management, plant diversity, animal health, and/or irrigation purposes as outlined in the appropriate NRCS irrigation system standard. A 2" water ram, with 10 gpm of inlet flow and 10 feet of drop, can supply about 1.0 gpm to a location about 50 feet higher than the water ram.

Feature Measure: Number of Ram Pumps

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,460.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,460.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #160 - Livestock Nose Pump

Scenario Description:

A Nose Pump is a diaphragm pump located in a pasture for the purpose of providing water to cattle. For a permanent installation, it is typical to also install Heavy Use Area Protection (561) (separate contract item) where the cattle congregate around the pump. It is powered and operated by cattle to transfer water from a stream to a drinking bowl. The objective is to provide water to the cattle outside of a live stream or other natural water source thereby eliminating a significant erosion situation and while also improving water quality. The cattle thus have access to drinking water without having to enter the stream. Generally one nose pump is adequate for 20 cattle. Resource Concerns: Insufficient stockwater; Inefficient energy use - Equipment and facilities. Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Livestock have open access to a live stream or other existing natural water supply. Water supply is contaminated due to animal activity and stream banks are eroded on a daily basis. Improper cattle distribution results in poor water quality, poor grazing

After Situation:

One nose pump is installed with all appurtenances anchored to concrete pad with 6"x6"x10 Gauge reinforcement wire (9 ft x 4 ft x 5 in) or other appropriate secure base to supply water to cattle for improved livestock herd management. Additional Heavy Use Area Protection (561) in the form of crushed rock and at least 5 feet wide, may be installed (separate contract item) surrounding the concrete pad. Improved: water quality, soil quality, grazing management, plant diversity, and animal health.

Feature Measure: Number of Pumps

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,579.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,579.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #284 - Photovoltaic-Powered Pump, <4 kW

Scenario Description:

The typical scenario assumes installation of a submersible solar-powered pump in a well or a live stream. The installation includes the pump, wiring, drop pipe, solar panels, mounts, inverter, and all appurtenances. Note: It is generally not advisable to use a storage battery for a number of reasons. A storage tank is generally the most efficient method to store energy. Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Irrigation - energy consumption will be reduced and the increased pressure and flow rates will improve irrigation efficiency. Resource Concerns: Insufficient stockwater. Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Livestock: Inadequate supply or location of water for a prescribed grazing system. Eroded stream banks and degraded water quality due to livestock access to stream. Cattle are not well-distributed because of remote water location. Irrigation: Pressure and

After Situation:

The typical scenario assumes installation of 1 kilowatt of photovoltaic (PV) panels, capable of operating a 1 horsepower solar-powered submersible pump in a well or other water source (Notes: 1) A PV panel is rated under standard and ideal conditions which will most likely not be replicated in the field; 2) 1 Horsepower is defined as 0.746 kilowatts.. The installation includes the pump, wiring, pipeline in the well, solar panels, frame mounts, controller, and all appurtenances. Water will be pumped to an existing storage tank at a higher elevation from which it will be used to pressurize the Livestock Pipeline (516) or Irrigation Pipeline (430). Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Grazing has potential to be well distributed. Irrigation: Improved pressure and flow rate will improve irrigation efficiency.

Feature Measure: Pumping plant photovoltaic

Scenario Unit: Kilowatt

Scenario Typical Size: 1.0

Scenario Total Cost: $9,918.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9,918.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 533 - Pumping Plant

Scenario: #291 - Internal Combustion-Powered Pump, Excess Water Removal, low-head, high-flow axial pump > 100 HP

Scenario Description:

The typical scenario supports installation of a pump to remove excess water in an existing drainage system. Size of pump is determined by analysis of surface water influenced by installation and a recommended withdrawal rate of 2inches per 24hrs for ag fields canal and ditch systems. ICE required due to lack of electrical grid in rural, lowland coastal areas and reduce dependency on power grid that may be disrupted by storms & hurricanes. Calculations assuming a 500 ac tract. Required gpm to remove 2inches from field area and associated ditch/canal system: 19,000 gpm for 24 hrs. operation. Assume operating head equals 15 feet and pump and power plant efficiency 60percent (Q x H /3960/Eff.) estimates brake horsepower (BHP) required is approximately 120 HP. Resource Concerns: Remove excessive subsurface or surface water. Water Quality degradation - Excess nutrients in surface and ground waters; Improved plant condition & health Associated Practices include: 342 - Critical Area Planting, 587- Structure for Water Control.

Before Situation:

Excessive drainage and surface water on fields are adversely affecting crop and soil health and fertilizer uptake. Fields are located in coastal plan areas with low elevations and low-head drainage infrastructure. Large precipitation events and hurricanes

After Situation:

Fields under influence of installed pumping plant is made more climate resilient; able to remove excess water from fields prior to large rainfall and hurricane events and able to remove deposited rainfall more effectively post-storm even if power grid is affected. Crop, soil, and surrounding landscape health and resiliency improved. System may also be utilized to prepare fields for large storm events by pre-emptively removing water from system. Calculations assuming a 500 ac tract. Required gpm to remove 2inches from field area and associated ditch and canal system: 19,000 gpm for 24 hrs. operation. Assume operating head = 15feet and pump efficiency 60percent (Q x H /3960/Eff.) estimates BHP approximately 120 HP. Associated Practices include: 342 - Critical Area Planting, 587- Structure for Water Control.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 120.0

Scenario Total Cost: $88,082.25

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $734.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 554 - Drainage Water Management

Scenario: #1 - Drainage Water Management (DWM)

Scenario Description:

This scenario is the process of managing water discharges from surface and/or subsurface agricultural drainage systems by reducing nutrient loading into surface waters. Typical systems consist of a 75 acre field with existing drainage tile lines and installed water control structures. The operator goes to the field in order to adjust water control structures (riser boards). While on site the date and adjustment information is recorded/logged. The number of yearly adjustments is based on 6 trips to a field 5 miles from headquarters. The field time to make and record each adjustment is 0.5 hours per structure (including travel time). The typical field will contain 5 water control structures; 3 structures control field water levels and 2 structures control a single denitrifying bioreactor. Resource Concern: Water Quality - Excess Nutrients in surface and ground waters. Associated Practices: 606-Subsurface Drain; 607-Surface Drain, Field Ditch; 608-Surface Drain, Main or Lateral; 587-Structure for Water Control; 590-Nutrient Management .

Before Situation:

Existing drainage systems are in place and water flows uncontrolled.

After Situation:

Existing drainage systems are managed to reduce flow of field drainage waters from the site and reduce nitrate loading by denitrification.

Feature Measure: Number of Control Structur

Scenario Unit: Each

Scenario Typical Size: 5.0

Scenario Total Cost: $539.11

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $107.82

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 554 - Drainage Water Management

Scenario: #15 - Automated Drainage Water Management

Scenario Description:

This scenario is the process of managing the drainage water discharge volume and water table elevation by regulating the flow from surface and/or subsurface agricultural drainage systems utilizing automation. Typical systems consist of a field with a fairly flat slope (less than 2% and preferably less than 1%) with existing drainage tile lines and installed water control structures which are operated with automated slide gates, and telemetry data systems coupled with cloud data management. Typical affected area for an automated drainage water management structure is 10 to 20 acres. The operator, from handheld device, adjusts water control structures (gate elevation) and logs data. Educational meeting is conducted between consultant and operator(s) annually for essential knowledge transfer Resource Concern: Water Quality - Excess Nutrients in surface and ground waters. Associated Practices: 606-Subsurface Drain; 607-Surface Drain, Field Ditch; 608-Surface Drain, Main or Lateral; 587-Structure for Water Control; 590-Nutrient Management.

Before Situation:

Existing inefficient drainage systems are in place and water flows uncontrolled, resulting in sediment and nutrient laden outflow entering ditches or streams.

After Situation:

Existing drainage systems are managed utilizing telemetry and real-time data to retain moisture in the soil for plant uptake and to allow for enhanced nutrient utilization.

Feature Measure: Acres of Managed Drainage

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $422.54

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.45

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 558 - Roof Runoff Structure

Scenario: #1 - Gutters and downspouts

Scenario Description:

A roof runoff structure, consisting of gutter(s), downspout(s) and splashguards. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, cont

After Situation:

Gutters, downspouts and splashguards servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 180 ln.ft. serviced with gutter, downspouts, and appurtances.

Feature Measure: Linear Length of Roof to be

Scenario Unit: Foot

Scenario Typical Size: 180.0

Scenario Total Cost: $1,392.42

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 558 - Roof Runoff Structure

Scenario: #2 - Gutters, downspouts and fascia boards

Scenario Description:

A roof runoff structure, consisting of gutter(s) and downspout(s) only. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, cont

After Situation:

A gutter and downspout servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 180 ln.ft. serviced with gutter, downspouts, and appurtances.

Feature Measure: Linear Length of Roof to be

Scenario Unit: Foot

Scenario Typical Size: 180.0

Scenario Total Cost: $2,300.34

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 558 - Roof Runoff Structure

Scenario: #3 - Gutters, downspouts and storage tank

Scenario Description:

A roof runoff structure, consisting of gutter(s), downspout(s), and a storage tank. Used to keep roof clean water runoff uncontaminated, provide storage for on-farm use of roof water and a stable outlet for any excess to ground surface in a way that avoids erosion. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, cont

After Situation:

A gutter and downspouts servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 180 ln.ft. serviced with gutter, downspouts, and appurtenances. A 1,500-gallon tank is installed for storage and use of roof runoff. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), High Tunnel System (325), and any relevant irrigation practices.

Feature Measure: Total Capacity of Storage Ta

Scenario Unit: Gallon

Scenario Typical Size: 1,500.0

Scenario Total Cost: $4,811.77

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.21

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 558 - Roof Runoff Structure

Scenario: #4 - Concrete Curb

Scenario Description:

A roof runoff structure, consisting of a concrete curb or parabolic channel installed on existing impervious surface or the ground with appropriate outlet facilities. Environmental/design considerations, for example – snow loads, or a building without proper structural support needed for gutters dictate the use of an on-ground concrete curb. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects the environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), and Diversion (362).

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, cont

After Situation:

A concrete curb or parabolic channel and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Concrete curb (6" high - 2' wide) extending the length of a 200' roof with additional length (5') for stable outlet.

Feature Measure: Linear Length of Roof to be

Scenario Unit: Foot

Scenario Typical Size: 200.0

Scenario Total Cost: $4,895.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $24.48

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 558 - Roof Runoff Structure

Scenario: #5 - Trench Drain

Scenario Description:

A roof runoff structure, consisting of a trench filled with rock, with a polyethylene, corrugated, perforated drain tile installed in trench bottom. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Environmental/design considerations, for example – snow loads, or a building without proper structural support needed for gutters dictate the use of a trench drain. Facilitates waste management and protects the environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), and Diversion (362).

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, cont

After Situation:

A 2' deep by 3' wide by 200 long deep rock filled, tile drained trench and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion.

Feature Measure: Linear Length of Roof to be

Scenario Unit: Foot

Scenario Typical Size: 200.0

Scenario Total Cost: $3,327.07

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $16.64

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 558 - Roof Runoff Structure

Scenario: #6 - Drip pad

Scenario Description:

A roof runoff structure, consisting of a pad filled with rock located at the drip line of a building. Used to provide a stable outlet to ground surface. Environmental/design considerations, for example – snow loads, or a building without proper structural support needed for gutters dictate the use of a trench drain. Facilitates waste management and protects the environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), and Diversion (362).

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, cont

After Situation:

A 6" deep by 2' wide by 200 long deep rock filled splash pad, servicing the portion of the building roof that creates erosion and addresses a water quality resource concern.

Feature Measure: Linear length of roof to be d

Scenario Unit: Foot

Scenario Typical Size: 200.0

Scenario Total Cost: $1,009.82

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.05

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 558 - Roof Runoff Structure

Scenario: #7 - Roof runoff storage tank

Scenario Description:

A roof runoff storage tank is added to an existing structure with gutters and downspouts that meet our 558 Roof Runoff Structure standard. Used to keep roof clean water runoff uncontaminated, provide storage for on-farm use. Must be coupled with a stable outlet for any excess to ground surface in a way that avoids erosion (typically combined with 620 Underground Outlet). Facilitates water management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management structure is already in place/is included in an overall plan for waste management; (2) roof runoff needs to be stored and used with any possible overflow diverted away from structures or contaminated areas; (

After Situation:

Storage tank added to existing gutters and downspouts that meet NRCS standards and are servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 180 ln.ft. serviced with a water storage tank added. A 1,500 gallon tank is installed for storage and use of roof runoff.

Feature Measure: Gallons of storage capacity

Scenario Unit: Gallon

Scenario Typical Size: 1,500.0

Scenario Total Cost: $3,768.96

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.51

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 558 - Roof Runoff Structure

Scenario: #33 - High Tunnel Roof Runoff Trench Drain and Storage

Scenario Description:

NOT TO BE USED WHERE CONTAMINATED SOIL EXIST. An urban agricultural producer wishes to address a resource concern such as a need for water or erosion around high tunnel from roof runoff and collect and store roof runoff for reuse as supplemental irrigation/water supply water. Associated Practice: High Tunnel

Before Situation:

Producer has resource concern such as erosion caused by roof runoff from an installed high tunnel

After Situation:

A 2' deep by 3' wide by 100' long trench filled with clean stone w/ 4-8 inch perforated PE pipe located on both sides of the high tunnel collect the roof runoff and divert to an underground storage tank. Trench drain typically installed at ground level under the edge of a high tunnel. Outlet from 'Trench Drain' conveys water to a buried storage tank. Typically installed to capture water for reuse or to stop erosion caused by concentrated roof runoff.

Feature Measure: Length of high tunnel

Scenario Unit: Linear Foot

Scenario Typical Size: 100.0

Scenario Total Cost: $5,499.64

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $55.00

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 560 - Access Road

Scenario: #1 - New Gravel Road, Level Terrain

Scenario Description:

This scenario is for newly constructed road of compacted gravel surfacing material and geotextile on relatively level ground. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise which requires, but does not have, a fixed travel way for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compact

After Situation:

The road will be 14 feet wide with 8 inch gravel surfacing at the top. It is 90% on original ground with 10% on fill with an average height 1.3 foot. Typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All revegetation of disturbed areas is provided. Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of Roadway

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $24,691.65

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $24.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 560 - Access Road

Scenario: #2 - Rehabilitation of existing gravel road in level terrain

Scenario Description:

This scenario is for the repair and rehabilitation of an existing road with a compacted gravel surface on an existing alignment in level terrain. The extent of construction work over an existing alignment is assumed to average 50% of the work for a new installation. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise with an existing access road which is beyond its useful lifespan, can no longer be used as intended without rehabilitation. If left in its current condition , it will result in continued compaction, excessive sediment in surface

After Situation:

The damaged portions of the road will be repaired to a full 14 feet width with a 8" gravel surface at the top, mostly in original ground. Less than 10% of the total is in fill with an average height of 1' and typical side slopes 2:1. A properly repaired access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport and improving drainage of irrigated lands. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided. Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of Roadway

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $16,589.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $16.59

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 560 - Access Road

Scenario: #3 - New Gravel Road, Sloped Terrain

Scenario Description:

This scenario is for newly constructed road of compacted gravel surfacing material and geotextile on sloped ground. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise which requires, but does not have, a fixed travel way for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compact

After Situation:

The road will be 14 feet wide with 8 inch gravel surfacing at the top. Seventy percent will be on original ground with 15% in embankment less than 2 feet in depth (average 1.3 foot) and 15% in excavation less than 2 feet in height (average 1.3 ft) with typical side slopes 2:1. The excavation is assumed to be 80% common earth and 20% rock excavation. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All revegetation of disturbed areas is provided. Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of Roadway

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $28,029.45

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $28.03

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 560 - Access Road

Scenario: #4 - Rehabilitation of existing gravel road in sloped terrain

Scenario Description:

This scenario is for the repair and rehabilitation of an existing road with a compacted gravel surface on an existing alignment in sloped terrain. The extent of construction work over an existing alignment is assumed to average 50% of the work for a new installation. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise with an existing access road which is beyond its useful lifespan, can no longer be used as intended without rehabilitation. If left in its current condition , it will result in continued compaction, excessive sediment in surface

After Situation:

The damaged portions of the road will be repaired to a full 14 feet width with a 8" gravel surface at the top. Approximately 85% of the road surface will need some regrading for 50% of the surface. The areas previously cut to install this road need no additional cut. The 15% of the road that has fill material will need to be refilled for 50% of the area. A properly repaired access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided. Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of Roadway

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $17,016.97

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $17.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 560 - Access Road

Scenario: #47 - New 6 inch gravel road in wet, level terrain less than 300 feet

Scenario Description:

Newly Constructed gravel road with min. 6 inch thick compacted gravel surface in relatively level ground in wet areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise which requires, but does not have, a fixed travel way for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compact

After Situation:

The road will be 14 feet wide with 6 inch gravel surfacing at the top. It is mostly in embankment less than 3 feet in height, (average 2 ft) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided. Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of road

Scenario Unit: Linear Foot

Scenario Typical Size: 150.0

Scenario Total Cost: $4,247.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $28.32

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 560 - Access Road

Scenario: #48 - New earth road in dry, level terrain less than 300 feet

Scenario Description:

Newly constructed compacted earth road in relatively level terrain and dry areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise which requires, but does not have, a fixed travel way for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compact

After Situation:

The road will be 14 feet wide at the top, mostly in embankment less than 3 feet in height, (average 2 ft) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport and improving drainage of irrigated lands. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided. Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of roadway

Scenario Unit: Linear Foot

Scenario Typical Size: 150.0

Scenario Total Cost: $2,402.01

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $16.01

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 561 - Heavy Use Area Protection

Scenario: #1 - Reinforced Concrete, no curb

Scenario Description:

An eroding area around a watering trough will be stabilized with a reinforced concrete pad with no curb. Installation includes all materials, equipment, vegetation of disturbed areas, and labor to install this practice. Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

Before Situation:

The area around a watering trough is muddy and eroding due to trampling by animals as they use the trough.

After Situation:

The stabilized area is surfaced with approximately 630 square feet of approximately 12 cubic yards of welded wire mesh reinforced concrete (6” thick) with 8 cubic yards of sand or gravel foundation material (4” deep). Excavation of about 20 CY of soil is required. The removed material will be spread in the adjacent area to a depth of 2”. Approximately 400 square feet of disturbed areas and 3200 sf of spoil area is seeded.

Feature Measure: Area

Scenario Unit: Square Foot

Scenario Typical Size: 630.0

Scenario Total Cost: $7,556.05

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 561 - Heavy Use Area Protection

Scenario: #2 - Rock/Gravel on Geotextile (Region)

Scenario Description:

An eroding area where there is winter feeding of livestock will be stabilized with a rock and/or gravel pad on a geotextile fabric foundation. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice, Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

Before Situation:

Typical situation is in a pasture setting where a small herd (< 30 head) is fed at a small winter feeding area away from surface water bodies. This pad is usually shared by 2 or more rotated pastures and has good grass or other filter area between it and

After Situation:

The stabilized area is surfaced with approximately 1624 square feet (28 ft x 58 ft x 6 in thick) of rock/gravel over a geotextile. Approximately 200 square yards of geotextile fabric will be used. Excavation of 30 CY of material will be needed. The removed material will be spread in the adjacent area to a depth of 2”. Revegetation of disturbed areas is assumed to extend 10 feet from the perimeter of the pad (2120 sf) and will include the spoil area of 4862 sf.

Feature Measure: Area of Rock and or Gravel

Scenario Unit: Square Foot

Scenario Typical Size: 1,624.0

Scenario Total Cost: $3,748.36

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 561 - Heavy Use Area Protection

Scenario: #3 - Rock/Gravel-GeoCell-Geotextile (Region)

Scenario Description:

An eroding area around a watering trough will be stabilized with rock and/or gravel in a cellular containment grid on a geotextile fabric foundation. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice. Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with the heavy use area, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

Before Situation:

The area around a watering trough is muddy and eroding due to trampling by animals as they use the trough.

After Situation:

The stabilized area is surfaced with approximately 630 square feet of rock and/or gravel in approximately 70 square yards of cellular containment grid on approximately 80 square yards of geotextile fabric foundation material (15% overlap). Four inches of gravel are placed in the geocell and an additional 4 inches are placed on top of the geocell to protect the geocells from damage. Excavation of approximately 16 CY is required. The removed material will be spread in the adjacent area to a depth of 2”. Approximately 400 square feet of disturbed areas and 2600 sf of spoil area is reseeded.

Feature Measure: Area of Rock and or Gravel

Scenario Unit: Square Foot

Scenario Typical Size: 630.0

Scenario Total Cost: $3,883.46

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.16

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 561 - Heavy Use Area Protection

Scenario: #5 - Concrete Slab with curb (reinforced)

Scenario Description:

A concrete pad with a curb is intensively used by larger herds (> 50 head) of livestock typically concentrated year round. Manure and wasted feed are collected/transferred very frequently (daily to every other day) to a storage facility. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice, Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation. A concrete pad with a curb is intensively used by larger herds (> 50 head) of livestock typically concentrated year round. Manure and wasted feed are collected/transferred very frequently (daily to every other day) to a storage facility. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice, Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

Before Situation:

Cattle are fed in a concentrated area all year round. Animal waste is causing a resource concern because it is difficult to collect from the existing earthen surface.

After Situation:

The stabilized area is 40' x 100'x 5.5” thick reinforced concrete pavement on 49 cubic yards of compacted, graded aggregate gravel material. The site has a slope of less than or equal to 10%. The concrete HUA is designed to support heavy equipment loads for manure management. It provides a permanent area of steel reinforced 5.5" thick concrete (typically #4 or #5 rebar on 12" centers). A 12 inch tall by 8 inch wide reinforced concrete curb is included around the perimeter of the slab to contain scraped waste materials for transport to storage facility. The curb extends down the long sides of the pad. A 18" wide by 12" deep footer is placed along the short sides of the pad which will have tractor access. Excavation of 111 CY of material will be needed. The removed material will be spread in the adjacent area to a depth of 2”. Revegetation of disturbed areas is assumed to extend 10 feet from the perimeter of the pad (3200 sf) and will include the spoil area of about 18,000 sf.

Feature Measure: Area of concrete

Scenario Unit: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $47,807.84

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11.95

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 561 - Heavy Use Area Protection

Scenario: #6 - Concrete(reinforced) Curb on existing slab

Scenario Description:

This practice is typically associated with confined animal feeding operation but can be considered for larger herds (> 50 head) on multiple pasture-based grazing systems where animals are managed in controlled central area for winter feeding and lounging. A Comprehensive Nutrient Management Plan (CNMP) would usually address use of this scenario on a confined animal feeding operation. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice, Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

Before Situation:

Before the practice is installed cattle waste accumulates on the slab but can run off the edges of the slab since there are no curbs to contain it.

After Situation:

A 12" tall by 8" wide reinforced concrete curb is installed on the two long sides of an existing 100’ x 40’ concrete slab. The curb is typically reinforced with #4 or #5 steel bars. The curbs will aid in manure management and reduce water quality degradation.

Feature Measure: Length of concrete curb in L

Scenario Unit: Foot

Scenario Typical Size: 280.0

Scenario Total Cost: $5,926.87

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $21.17

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 561 - Heavy Use Area Protection

Scenario: #7 - Reinforced concrete slab on a hillside site

Scenario Description:

A concrete pad with a curb is intensively used by larger herds (> 50 head) of livestock typically concentrated year round. Manure and wasted feed are collected/transferred very frequently (daily to every other day) to a storage facility. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice, Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

Before Situation:

Cattle are fed in a concentrated area. Animal waste is causing a resource concern as it is not being captured and properly utilized.

After Situation:

The stabilized area is 40' x 100'x 5.5” thick reinforced concrete pavement on 49 cubic yards of compacted, graded aggregate gravel material. The site has a slope of less than or equal to 10%. The concrete HUA is designed to support heavy equipment loads for manure management. It provides a permanent area of steel reinforced 5.5" thick concrete (typically #4 or #5 rebar on 12" centers). A 12 inch tall by 8 inch wide reinforced concrete curb is included around the perimeter of the slab to contain scraped waste materials for transport to storage facility. The curb extends down the long sides of the pad. An 18" wide by 12" deep footer is placed along the short sides of the pad which will have tractor access. Excavation and re-placement of 634 CY of material will be needed. Cuts and fills will be balanced. The removed material will be spread in the adjacent area to a depth of 2”. Revegetation of disturbed areas is assumed to extend 25 feet from the perimeter of the pad (8000 sf).

Feature Measure: Area of concrete

Scenario Unit: Square Foot

Scenario Typical Size: 4,000.0

Scenario Total Cost: $56,982.09

Total Cost per Unit: $14.25

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 561 - Heavy Use Area Protection

Scenario: #8 - Concrete Slab, not rebar reinforced

Scenario Description:

A small winter feeding area will be stabilized by installation of a 5 inch thick concrete slab that is .not rebar reinforced. Waste materials are removed periodically from the pad with small front end loader tractor and land applied at appropriate times. This practice is typically associated with pasture grazing operations and would be located to serve 2 or more pastures. Installation includes all materials, equipment, vegetation of disturbed areas, and labor to install this practice. Where contaminated runoff will cause a resource concern, make provisions to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (Code 380) or Herbaceous Wind Barriers (Code 603). This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

Before Situation:

This scenario addresses stabilizing soil areas where livestock are fed, typically during winter months. Typical herd size is small to medium (~30 to 50 head). Currently the cattle are winter fed on the ground and they disturb the soil, degrading soil qual

After Situation:

The 25' by 25' x 5.5” thick (630 square foot) stabilized area is surfaced with approximately 11 cubic yards of concrete with fiber reinforcement on 8 cubic yards of graded aggregate gravel material for surfacing areas. Excavation of about 18 CY of soil is required. The removed material will be spread in the adjacent area to a depth of 2”. Approximately 1400 square feet of disturbed areas and 3020 sf of spoil area is reseeded.

Feature Measure: Area of concrete

Scenario Unit: Square Foot

Scenario Typical Size: 630.0

Scenario Total Cost: $4,999.61

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 561 - Heavy Use Area Protection

Scenario: #17 - Vegetated dairy loafing lots

Scenario Description:

A loafing lot system consisting of a minimum of three vegetated paddocks (HUAs) will be established for a dairy operation. Installation includes all materials, equipment, and labor to install this practice. Where contaminated runoff will cause a resource concern, provisions will be made to collect, store, utilize, and/or treat contaminated runoff in accordance with the appropriate Conservation Practice Standard. This practice applies where areas frequently and/or intensively used by livestock require treatment to address soil erosion, water quality degradation, and animal health concerns. Associated practices may include Fence (Code 382), Trails and Walkways (Code 575), Livestock Pipeline (Code 516), and Watering Facility (Code 614). Rotational loafing systems are different from rotational grazing systems in that 100% of the feed ration is supplied. Although there will be some incidental grazing of the paddocks, the primary use of the paddocks will be loafing. The use of dairy loafing lot systems is recommended by Virginia Tech Cooperative Extension (Jerry M. Swisher, multiple publications). Excess vegetation in the paddocks will be harvested for hay, utilizing nutrients accumulated in the paddock.

Before Situation:

A dairy has a large, surfaced or unsurfaced area used for loafing. The cows are confined to this area when not in the milking parlor or barn, or feeding area. The animals lay in the mud and manure during the rest times. Contaminated runoff from the area c

After Situation:

A minimum of three HUA paddocks, vegetated with a tough, durable grass that germinates quickly, are used as rotational loafing areas. One hundred percent of the daily ration is provided by feeding. Dairy cows loafing on grass are cleaner and cooler and have fewer hoof and leg issues, which typically result in improved animal health. During periods when the paddocks are wet, the cows will remain on the sacrifice area. The sacrifice area may be an unroofed, surfaced or unsurfaced lot or an existing structure, such as a free stall barn, which does not contribute to the resource concern. Manage this practice in accordance with the requirement in the CPS, Design Note, and Implementation Requirements. Example: Use 100 head of 1,400 pound Holsteins in the milking herd. Based on 1,000 lbs./a.u., paddock size will be based on 17 cows per acre. Each paddock will be about 6 acres. Anticipated usage of the paddock is 6 hours per day for about 228 days per year. Total paddock area = 18 acres. Approximately 6 hours per day will be spent in the sacrifice area when the paddock cannot be used due to wet conditions (approx. 137 days per year). The amount of time spent in the sacrifice area will be reduced by the use of loafing paddocks and the size of an unroofed sacrifice area will be reduced. Therefore, the amount of manure accumulation on the sacrifice area will be reduced. Manure in the paddock may be spread out by dragging. Nutrient utilization will be through haying of excess growth.

Feature Measure: Area

Scenario Unit: Acre

Scenario Typical Size: 18.0

Scenario Total Cost: $4,764.34

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $264.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 561 - Heavy Use Area Protection

Scenario: #30 - Confined Poultry outdoor access

Scenario Description:

This scenario only applies to confined poultry with outdoor access. Newly constructed heavy use area protection with a minimum 6" inch thick crushed #1 gravel will be installed around the static house and extend 10feet. Geogrid or Astroturf will be installed for 20feet from the gravel and length of building. The area will need to be overseeded with a locally appropriate vegetation.

Before Situation:

Area around the confined poultry area with outdoor access is denuded around the static boundary. Erosion and nutrient accumulation will occur and continue to occur, which will lead to soil and water quality degradation.

After Situation:

The site around the confined poultry area with outdoor access has been stabilized with an gravel, astroturf type material and vegetation.

Feature Measure: Protection area

Scenario Unit: Square Foot

Scenario Typical Size: 9,000.0

Scenario Total Cost: $33,695.68

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 561 - Heavy Use Area Protection

Scenario: #47 - Rock/Gravel on Geotextile

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with rock and or gravel on a geotextile fabric foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice, The stabilized area will address the resource concerns of soil erosion and water quality degradation.

Before Situation:

This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

After Situation:

The stabilized area is surfaced with approximately 630 square feet of rock and or gravel on approximately 70 square yards of geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All seeding or revegetation of disturbed areas is provided. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Feature Measure: Area of Rock and or Gravel

Scenario Unit: Square Foot

Scenario Typical Size: 630.0

Scenario Total Cost: $1,336.41

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 570 - Stormwater Runoff Control

Scenario: #1 - Combination, Most common Best Management Practices

Scenario Description:

This scenario involves installation of silt fence, straw wattles, and straw bales on the construction site as part of one conservation engineering system. The combined system shall include two or more components and will address the resource concerns related with concentrated flow erosion, excessive sediment in surface waters as well as protection of existing inlets and structures depending on the combination.

Before Situation:

The combination scenario is applicable in all construction sites and watersheds including those in the urban and suburban areas. Which component would apply in a particular situation would depend on the site condition, slope etc.

After Situation:

When properly installed, the combination structures slow down runoff flow velocity and reduce high velocity erosion, detain and filter the stormwater runoff and provide a controlled release to the downstream areas. In seeded areas, straw wattles also enable seeds to settle and germinate, aiding the revegetation process. By filtering overland runoff and holding sediment on the slope, Straw Wattles also help to protect lakes, ponds, rivers and streams from sediment pollution. By filtering overland runoff and holding sediment on the slope, straw bales can also help to protect water quality. Silt fence are installed along the downstream perimeter of a construction site to prevent sediment transport off construction areas. A typical silt fence consists of a synthetic filter fabric stretched between a series of fence stakes, with the stakes installed on the downstream side of the perimeter and the fabric trenched into the soil on the upstream side and backfilled. All erosion control blankets and straw mulches will be covered under 484-Mulching. If earthen basins are warranted for water quality improvement or retention/detention purposes, use Sediment Basin (350) or Dam (402) as appropriate. If seeding is warranted for water quality and erosion control purposes, all temporary and permanent vegetation will use Critical Area Planting (342).

Feature Measure: Area of construction site

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,311.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,311.56

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 570 - Stormwater Runoff Control

Scenario: #2 - Silt Fence

Scenario Description:

This scenario involves installation of silt fence on construction sites as part of a conservation engineering system. The system will address the resource concerns related with concentrated flow erosion, excessive sediment in surface waters as well as protection of existing inlets and structures depending on the situation.

Before Situation:

The silt fence scenario is applicable in all construction sites and watersheds. Lack of erosion control is resulting in sediment filled runoff entering surface waters.

After Situation:

When properly installed, silt fences can slow down runoff flow velocity and reduce high velocity erosion, detain and filter the stormwater runoff and provide a controlled release to the downstream areas. Silt fences also help to protect lakes, ponds, rivers and streams from sediment pollution. . They also help to reduce sediment transport and stabilize the construction area. Silt fence are installed along the downstream perimeter of a construction site to prevent sediment transport off construction areas. A typical silt fence consists of a synthetic filter fabric stretched between a series of fence stakes, with the stakes installed on the downstream side of the perimeter and the fabric trenched into the soil on the upstream side and backfilled. If earthen basins are warranted for water quality improvement purpose, use Sediment Basin (350) or Dam (402) as appropriate. If seeding is warranted for water quality and erosion control purpose, use Critical Area Planting (342).

Feature Measure: Linear Foot of Silt Fence Inst

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $3,060.60

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 570 - Stormwater Runoff Control

Scenario: #22 - Rain Garden, greater than 750 sqft

Scenario Description:
Typical Size: 36' x 30' area, 4-8" deep. Additional Considerations from the practice standard that would be addressed by the practice are: Design stormwater control practices to fit into the visual landscape as well as to function for runoff control. If properly designed, stormwater control practices can be beneficial to wildlife.

Before Situation:
Stormwater is managed to prevent erosion from farmstead impervious surfaces and practice standard is met

After Situation:
Stormwater is managed to prevent erosion, reduce quantity of runoff, enhance visual impact and increase wildlife habitat and/or food.

Feature Measure: square feet of rain garden

Scenario Unit: Square Foot

Scenario Typical Size: 1,080.0

Scenario Total Cost: $1,434.84

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.33

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 570 - Stormwater Runoff Control

Scenario: #33 - Rain Garden, 750 sqft or less

Scenario Description:

Typical Size: Drainage area 3750sqft. Garden size 20' x 30' area, 4-8" deep. Additional Considerations from the practice standard that would be addressed by the practice are: Design stormwater control practices to fit into the visual landscape as well as to function for runoff control. If properly designed, stormwater control practices can be beneficial to wildlife.

Before Situation:

Stormwater from farmstead impervious surfaces causes erosion and flooding

After Situation:

Stormwater is managed to prevent erosion, reduce quantity of runoff, enhance visual impact and increase wildlife habitat and/or food.

Feature Measure: sqft of rain garden

Scenario Unit: Square Foot

Scenario Typical Size: 600.0

Scenario Total Cost: $1,246.76

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 572 - Spoil Disposal

Scenario: #5 - Spoil Spreading

Scenario Description:
A spoil pile is spread over a designated area according to an approved plan. The resource concerns are Soil Erosion and Water Quality Degradation.

Before Situation:
Spoil material is available from excavation of channels, drainage ditches, irrigation canals, or other construction sites.

After Situation:
Land has been shaped to the required elevations and grades. Resource concerns have been treated. Associated practices, like critical area planting or irrigation/drainage water management practices, would be contracted separately as needed.

Feature Measure: Cubic yards of spoil spread

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,000.0

Scenario Total Cost: $4,219.90

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.22

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 574 - Spring Development

Scenario: #1 - Large spring with Concrete Cutoff Wall

Scenario Description:

Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing a 50 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (50 ft long) and behind a concrete cutoff wall (6 inch x 4 ft height x 25 ft long) to retain water. Water is directed (via 20 ft long, 4 inch PVC) to a spring box (48 inch diameter x 6 ft long CMP) that is located at the cutoff wall or below the wall, equipped with a watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

Before Situation:

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

After Situation:

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

Feature Measure: Number of Developments

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $6,515.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,515.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 574 - Spring Development

Scenario: #2 - Small Spring with Concrete Cutoff Wall

Scenario Description:

Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock, irrigation, wildlife needs, etc. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing a 40 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (40 ft long) and behind a concrete cutoff wall (6 inch x 3 ft height x 8 ft long) to retain water. Water is directed (via 10 ft long, 4 inch PVC) to a spring box (18 inch diameter x 6 ft long HDPE Corrugated, Smooth Wall) that is located at the cutoff wall or below the wall, equipped with a watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

Before Situation:

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

After Situation:

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

Feature Measure: Number of Developments

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,440.89

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,440.89

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 574 - Spring Development

Scenario: #3 - Small Spring with Compacted Clay Cutoff Wall

Scenario Description:

Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock, irrigation, wildlife needs, etc. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing a 40 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (40 ft long) and behind a compacted clay cutoff wall (2' x 3 ft height x 8 ft long) to retain water. Water is directed (via 10 ft long, 4 inch PVC) to a spring box 6 ft long 18 inch HDPE Corrugated, Smooth Wall) that is located at the cutoff wall or below the wall, equipped with a watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

Before Situation:

Livestock operation has inadequate fresh water for livestock and an on-site undeveloped spring/seep.

After Situation:

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

Feature Measure: Number of Developments

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,200.18

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,200.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 574 - Spring Development

Scenario: #4 - Small Spring with Compacted Clay Cutoff Wall with Tank

Scenario Description:

Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock, irrigation, wildlife needs, etc. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing a 40 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (40 ft long) and behind a compacted clay cutoff wall (2' x 3 ft height x 8 ft long) to retain water. Water is directed (via 10 ft long, 4 inch PVC) to a spring box 6 ft long 18 inch HDPE Corrugated, Smooth Wall) that is located at the cutoff wall or below the wall, equipped with a watertight lid and two outlets. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. Because the spring is low flow, water must be collected overnight to meet the resource needs. Aa outflow pipe from the spring box is directed into a 1550 gallon storage tank (with overflow as needed) down slope of the spring and placed on 4" thick concrete pad, where stored water is distributed to livestock watering facilities, crops or both. Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342), Underground Outlet (620).

Before Situation:

Livestock and crop operation has inadequate quantity and quality of fresh water and an on-site undeveloped spring/seep.

After Situation:

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

Feature Measure: Number of Developments

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $5,236.09

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,236.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 574 - Spring Development

Scenario: #14 - Spring Development

Scenario Description:

Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing a 50 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (50 ft long) and behind a concrete cutoff wall (6 inch x 4 ft height x 25 ft long) to retain water. Water is directed (via 20 ft long, 4 inch PVC) to a spring box (48 inch diameter x 6 ft long CMP) that is located at the cutoff wall or below the wall, equipped with a watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

Before Situation:

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

After Situation:

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

Feature Measure: Number of Developments

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $6,476.45

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,476.45

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 575 - Trails and Walkways

Scenario: #2 - Vegetated Trail

Scenario Description:

A vegetated trail is installed to facilitate the movement of animals, people, or off-road vehicles in order to provide or improve access to forage, water, working/handling facilities, and/or shelter; improve grazing efficiency and distribution; protect ecologically sensitive, erosive and/or potentially erosive sites; provide pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations; or provide trails for recreational activities or access to recreation sites. Costs include excavation, shaping, grading, surfacing material, and all equipment, labor and incidental materials necessary to install the practice. Vegetation of areas disturbed by construction is included. This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice also applies to a trail constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

Before Situation:

The existing access to the site is located adjacent to a stream and needs to be moved to prevent erosion of materials into the stream. Only animal or ATV access is needed. The trail has very limited usage and soils are suitable for a vegetative surface.

After Situation:

The typical trail is a 12 foot wide, 300 foot long, lane of vegetated earth. This scenario includes vegetation of 3600 square foot for surfacing and vegetation of 1800 square feet of disturbed areas beside the trail. Stream Crossing (Code 578) will be used where the trail crosses a stream or shallow water area. Consider the use of water bars to control and direct water flow in the trail per the criteria in Access Road (Code 560). All culverts for drainage features will be applied under Structure for Water Control (Code 587). Use Diversion (Code 362) to keep clean water away from the walkway, as appropriate. Use Fencing (Code 382) when needed to control animal movement. The vegetation of this trail will be designed in accordance with the criteria in Heavy Use Area Protection (Code 561) but all materials are included in this scenario.

Feature Measure: Area of trail

Scenario Unit: Square Foot

Scenario Typical Size: 3,600.0

Scenario Total Cost: $2,062.08

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 575 - Trails and Walkways

Scenario: #3 - Reinforced Concrete Walkway

Scenario Description:

Construct an reinforced concrete walkway on a gravel foundation to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter; improve grazing efficiency and distribution; protect ecologically sensitive, erosive and/or potentially erosive sites; provide pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations; or provide walkways for recreational activities or access to recreation sites. Costs include excavation, shaping, grading, reinforced concrete surfacing, vegetation of disturbed areas, and all equipment, labor and incidental materials necessary to install the practice. This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a walkway constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

Before Situation:

A dairy operation moves cows from the pasture/loafing area to the milking parlor and back twice daily. The existing earthen path is covered in manure and is difficult to clean.

After Situation:

The typical walkway is 12 foot wide and 300 foot long and is constructed of reinforced concrete. Approximately 1800 square feet of disturbed area along the walkway and 8500 square feet (4 inches deep) of spoil area will be vegetated. The walkway will require approximately 106 CY of excavation (9.5 inches deep), 62 CY of reinforced concrete (5.5 inches thick), and 45 CY gravel foundation (4 inches thick). Stream Crossing (Code 578) will be used when the walkway crosses a stream or shallow water area. Culverts for drainage features will be applied using Structure for Water Control (Code 587). Use Diversion (Code 362) to keep clean water away from the walkway, as appropriate. Fencing (Code 382) will be used when needed to control animal movement. The concrete surface material for the walkway will be designed in accordance with the criteria in Heavy Use Area Protection (Code 561) but all materials are included in this scenario.

Feature Measure: Area of Walkway

Scenario Unit: Square Foot

Scenario Typical Size: 3,600.0

Scenario Total Cost: $36,289.84

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $10.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 575 - Trails and Walkways

Scenario: #4 - Rock/Gravel on Geotextile, Walkway

Scenario Description:

A walkway with a rock and/or gravel surface treatment over a geotextile fabric foundation will be installed to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter; improve grazing efficiency and distribution; protect ecologically sensitive, erosive and/or potentially erosive sites; provide pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations; or provide walkways for recreational activities or access to recreation sites. Costs include excavation, shaping, grading, rock and/or gravel, geotextile, vegetation of disturbed areas, and all equipment, labor and incidental materials necessary to install the practice. This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a walkway constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

Before Situation:

A beef operation moves cattle between pastures frequently. The existing earthen path is eroding and muddy.

After Situation:

The typical walkway is 12 foot wide and 300 foot long and is constructed of rock and/or gravel on a geotextile fabric foundation. The walkway will require approximately 67 CY of excavation, 67 CY of aggregate gravel, 460 SY of geotextile fabric (1.15 x 400 SY to account for overlap), and 7200 square feet of vegetation of the disturbed area (1800 square feet) and spoil area (5400 square feet). Stream Crossing (Code 578) will be used when the walkway crosses a stream or shallow water area. All culverts for drainage features will be applied under Structure for Water Control (Code 587). Consider the use of water bars to control and direct water flow in the walkway per the criteria in Access Road (Code 560). Use Diversion (Code 362) to keep clean water away from the walkway, as appropriate. Fencing (Code 382) will be used when needed to control animal movement. The surface material for the walkway will be designed in accordance with the criteria in Heavy Use Area Protection (Code 561) but all materials are included in this scenario.

Feature Measure: Area of Walkway

Scenario Unit: Square Foot

Scenario Typical Size: 3,600.0

Scenario Total Cost: $7,503.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 575 - Trails and Walkways

Scenario: #5 - Rock/Gravel in GeoCell on Geotextile, Walkway

Scenario Description:

A walkway with rock and or gravel in a cellular containment grid on a geotextile fabric foundation surface treatment is installed to provide or improve access to forage, water, working/handling facilities, and/or shelter; improve grazing efficiency and distribution; protect ecologically sensitive, erosive and/or potentially erosive sites; provide pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations; or provide a walkway for recreational activities or access to recreation sites. Costs include excavation, shaping, grading, wood chip surfacing, vegetation of disturbed areas, and all equipment, labor and incidental materials necessary to install the practice. This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a walkway constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

Before Situation:

A beef operation moves cattle between pastures frequently. The existing earthen path is eroding and muddy.

After Situation:

The typical walkway is 12 foot wide and 300 foot long and is constructed of rock and/or gravel in a cellular containment grid on a geotextile fabric foundation surface treatment. The walkway will require 89 CY of gravel for surfacing with 4 inches in the geocell and 4 inches on top for protection. Approximately 1800 square feet of disturbed areas along the sides of the walkway and 3600 sf of spread spoil material (spread 4” deep) will be vegetated. The walkway consist of approximately 89 CY of excavation and 400 SY of 4 inch geocell on a 460 SY of geotextile fabric foundation (with 15% overlap). Stream Crossing (Code 578) will be used where the walkway crosses a stream or shallow water area. Consider the use of water bars to control and direct water flow in the trail per the criteria in Access Road (Code 560). All culverts for drainage features will be applied under Structure for Water Control (587). Use Diversion (Code 362) to keep clean water away from the walkway, as appropriate. Fencing (Code 382) will be used when needed to control animal movement. The surface material will be designed in accordance with the criteria in Heavy Use Area Protection (Code 561) but all materials are included in this scenario.

Feature Measure: Area of Walkway

Scenario Unit: Square Foot

Scenario Typical Size: 3,600.0

Scenario Total Cost: $18,316.93

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 575 - Trails and Walkways

Scenario: #48 - Wood Chips, Walkway, 1000 sqft or less

Scenario Description:

Layout and construct a wood chip surface treatment on a earthen foundation walkway to facilitate the movement of animals, people, or small off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource concerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, wood chip surfacing, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by small off-road vehicles, such as Al

After Situation:

The typical walkway will be a 6 foot widex100 foot longx4" thick , 600 square foot of wood chip surface treatment on earthen foundation. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is wood chips of 600 square foot for surfacing.

Feature Measure: sqft of walkway

Scenario Unit: Square Foot

Scenario Typical Size: 600.0

Scenario Total Cost: $1,274.32

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 575 - Trails and Walkways

Scenario: #69 - Earth or vegetated trail 1000 sqft or less

Scenario Description:

Layout and construct an earth or vegetated trail to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide trails for recreational activities or access to recreation sites and address the resource concerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, earth and or vegetated surfaces and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terr

After Situation:

The typical trail will be a 6 foot wide 100 foot long, 600 square foot lane of earth and vegetation. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is clearing, grading, leveling, and tilling with 0.1 acres of seeding to stabilize disturbed areas on both sides. Consider the adequacy of natural surfacing. If the lane requires planting, the vegetation is provided. Where earth and or vegetation is not practical, adequate surface protection is provided under a different scenario. Stream Crossing, Code 578, will be used when the trail or lane crosses streams or shallow water areas. Consider the use of water bars to control and direct water flow in the trail. All culverts will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

Feature Measure: sqft of walkway

Scenario Unit: Square Foot

Scenario Typical Size: 600.0

Scenario Total Cost: $916.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.53

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 576 - Livestock Shelter Structure

Scenario: #1 - Prefabricated Portable Shade Structure

Scenario Description:

A flexible membrane or fabric-like roof placed on a steel or wood portable frame used to promote animal health where prescribed grazing practices have limited livestock access to shade. Cost estimate is based upon a 10 ft x 20 ft prefab portable structure. Associated practices include Fence (382), Prescribed Grazing (528), and Watering Facility (614).

Before Situation:

Livestock are being managed using a prescribed grazing plan resulting in a lack of shade during the summer months. The livestock are stressed and eat less frequently.

After Situation:

Livestock shade structures are rotated and sized according to NRCS plans and specifications. Livestock access to water, shade, and forage are dispersed to decrease animal stress and promote a better grazing and nutrient spreading.

Feature Measure: Area of Roof Frame

Scenario Unit: Square Foot

Scenario Typical Size: 200.0

Scenario Total Cost: $1,452.66

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 576 - Livestock Shelter Structure

Scenario: #2 - Portable Shade Structure

Scenario Description:

A flexible membrane or fabric-like roof placed on a steel or wood portable frame used to promote animal health where prescribed grazing practices have limited livestock access to shade. Cost estimate is based upon a 25 ft x 40 ft portable structure. Associated practices include Fence (382), Prescribed Grazing (528), and Watering Facility (614).

Before Situation:

Livestock are being managed using a prescribed grazing plan resulting in a lack of shade during the summer months. The livestock are stressed and eat less frequently.

After Situation:

Livestock shade structures are rotated and sized according to NRCS plans and specifications. Livestock access to water, shade, and forage are dispersed to decrease animal stress and promote a better grazing and nutrient spreading.

Feature Measure: Area of Roof Frame

Scenario Unit: Square Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $6,799.25

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.80

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 578 - Stream Crossing

Scenario: #2 - Hard armored low water crossing

Scenario Description:

Stabilize the channel bottom and bank access slope within stream channel using rock riprap or cast in place concrete. This scenario includes site preparation, dewatering, acquiring and installing gravel or geotextile with rock riprap or cast in place concrete on channel bottom and approaches. Final travel surface is 6" gravel(or concrete) surface. Scenario is for a crossing a 6' deep, 30' wide channel (this includes bank to bank computations), access slope of 4:1 SS, with riprap protected cut back banks at 2:1, width is 12 feet for a total length of 78' or area as 936 sf. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic or not for moving animals, vehicles or humans across or fording stream.

Before Situation:

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:

Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

Feature Measure: Crossing dimensions

Scenario Unit: Square Foot

Scenario Typical Size: 936.0

Scenario Total Cost: $13,549.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $14.48

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 578 - Stream Crossing

Scenario: #3 - Culvert installation

Scenario Description:

Install a new culvert. Work includes dewatering, site preparation and removing any old crossing, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and building headwalls. If a different travel surface is needed, refer to another appropriate standard for the surfacing. 30 inch Culvert installation with <75 cy of fill needed and < 2 yds rock riprap for headwalls. Pipe is 40 feet long. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Use (587) Structure for Water Control instead, for ditch cross culverts and other intermittent flows.

Before Situation:

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:

Access road and waterflow are able to cross each other in a stable manner. Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

Feature Measure: Culvert

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 1,200.0

Scenario Total Cost: $7,434.68

Total Cost per Unit: $6.20

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 578 - Stream Crossing

Scenario: #4 - Low water crossing using prefabricated products

Scenario Description:

To install a stable crossing medium on channel bottom and approaches. Medium includes but not limited to precast concrete blocks, geocells, pavers, and gabions. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Typical stream has 30 foot bottom width and approaches. Width is 14 feet for a total area as 420sf. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic.

Before Situation:

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:

Access road and waterflow are able to cross each other in a stable manner. Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

Feature Measure: low water crossing

Scenario Unit: Square Foot

Scenario Typical Size: 420.0

Scenario Total Cost: $3,929.60

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9.36

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 578 - Stream Crossing

Scenario: #16 - Low water crossing, flatter topography sites with shallow streams

Scenario Description:

Stabilize the stream channel bottom using non-woven geotextile and gravel. This scenario includes site preparation, acquiring and installing gravel on geotextile. Final travel surface is 6"-8" of large gravel base (2"-4" average diameter) and 2"-4" of smaller gravel finish surface (1"-1.5" average diameter). Scenario is for a crossing where the bank to bank width is 100ft., and no rock protection in the stream channel is needed; access ramps along the banks are excluded via 382 Fence; typical average width is 12.5ft. for a total area of 1,250sq.ft. Note: (396) Aquatic Organism Passage will be used in lieu of 578 when the primary intent is to serve biological concerns, not hydrologic or not for moving animals, vehicles or humans across or fording stream.

Before Situation:

Livestock and machinery could not cross stream without erosion and other non-point source pollution.

After Situation:

Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (382 Fencing), (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

Feature Measure: Crossing dimensions

Scenario Unit: Square Foot

Scenario Typical Size: 1,250.0

Scenario Total Cost: $3,860.19

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 580 - Streambank and Shoreline Protection

Scenario: #1 - Vegetative

Scenario Description:

Protection of streambanks consisting of conventional plantings of vegetation to stabilize and protect against scour and erosion. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation and erosion control fabric; a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility, 570 Stormwater Runoff Control

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has marginally degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The strea

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Square Foot of Streambank/

Scenario Unit: Square Foot

Scenario Typical Size: 20,000.0

Scenario Total Cost: $23,694.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 580 - Streambank and Shoreline Protection

Scenario: #2 - Bioengineered

Scenario Description:

Protection of streambanks consisting of a bioengineered technique comprised of non-structural measures such as earth revetments and benches with vegetative measures to stabilize and protect the streambank against scour and erosion. Soil bioengineering is a system of living plant materials used as structural components. Adapted types of woody vegetation (shrubs and trees) are initially installed in specified configurations that offer immediate soil protection and reinforcement. In addition, soil bioengineering systems create resistance to sliding or shear displacement in a streambank as they develop roots or fibrous inclusions. Environmental benefits derived from woody vegetation include diverse and productive riparian habitats, shade, organic additions to the stream, cover for fish, and improvements in aesthetic value and water quality. Under certain conditions, soil bioengineering installations work well in conjunction with structures to provide more permanent protection and healthy function, enhance aesthetics, and create a more environmentally acceptable product. Soil bioengineering systems normally use unrooted plant parts in the form of cut branches and rooted plants. For streambanks, living systems include brush mattresses, live stakes, joint plantings, vegetated geogrids, branch packing, and live fascines. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, live stake, rootwads and revetments: a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife-Habitat Degradation. Associated Practices include: 560 - Access Road; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility, 570 Stormwater Runoff Control,

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has moderately degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The strea

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Square Foot of Streambank/

Scenario Unit: Square Foot

Scenario Typical Size: 20,000.0

Scenario Total Cost: $58,386.61

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.92

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 580 - Streambank and Shoreline Protection

Scenario: #3 - Structural-Riprap, Block, Gabions

Scenario Description:

Protection of streambanks using structural measures such as riprap, concrete block, gabions, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; stream jetties; stream barbs; and gabions. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, geotextile, and rock rip rap; a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. The rock toe will be 3' thick and 5' high. The bank above the riprap will be graded to a stable slope and revegetated. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility, 570 Stormwater Runoff Control

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streamb

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Tons of Rock Riprap Installe

Scenario Unit: Ton

Scenario Typical Size: 2,750.0

Scenario Total Cost: $284,352.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $103.40

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 580 - Streambank and Shoreline Protection

Scenario: #4 - Structural-J Hook, Cross Vane

Scenario Description:

Protection of streambanks using bank stabilization measures to stabilize eroding stream bank, reduce near bank stress and prevent sediment from entering stream along banks of by constructing bankfull benches and using boulders and or log cluster (with boulders) to construct in-stream structures such as J-Hook, Vanes, Cross Vanes or Combo Root Wad/Log Vane and J-Hook structures. The purpose of this practice is to maintain, improve, and restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Scenario: Install 2 J hooks on 500 ' section of 100 SM watershed channel, where the bankfull depth is 8.0' and the J hook is as high as 1/2 bankfull or 4.0'. Each J hook develops an average pool depth of 8.0'and have a arm length of 130' long with a 53' long (7' deep)hook. Boulders are an average dimension of 3'x 2.5'x 2' and weigh 1,800#s. 225 boulders are required for one structure (125 CY). Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility, 570 Stormwater Runoff Control

Before Situation:

A streambank is unstable, vertical and eroding in a meander and laterally moving yearly moving into a landowners field at an accelerated rate. The stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: T

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Tons of boulders installed

Scenario Unit: Ton

Scenario Typical Size: 412.0

Scenario Total Cost: $58,075.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $140.96

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 580 - Streambank and Shoreline Protection

Scenario: #12 - Wood Structure

Scenario Description:

Protection of streambanks using bank stabilization measures to stabilize eroding stream bank, reduce near bank stress and prevent sediment from entering stream along banks by constructing bankfull benches and using engineered structures consisting primarily of wood. This includes but not limited to toe wood and engineered log jams. The purpose of this practice is to maintain, improve, and restore physical, chemical, and biological functions of a stream and to provide diverse aquatic communities to improve habitat for desired aquatic species. Typical stream has 50 foot bankfull width and 6 foot banks. Payment costs include installing toe wood, shaping bank, installing live stakes, and installing erosion control fabric. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 584 - Channel Bed Stabilization; 560 - Access Road; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility, 570 Stormwater Runoff Control

Before Situation:

A streambank is unstable, vertical and eroding in a meander and laterally moving yearly into a landowners field at an accelerated rate. The stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The stre

After Situation:

The streambank is stable against further erosion, encourages natural sediment transport and deposition, and increases quantity and quality of aquatic habitat. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat. The wood increases habitat availability and diversity.

Feature Measure: Linear Feet

Scenario Unit: Linear Foot

Scenario Typical Size: 100.0

Scenario Total Cost: $19,263.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $192.64

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 584 - Channel Bed Stabilization

Scenario: #1 - Bio-engineering

Scenario Description:

Stabilize the bottom and slope of a stream channel using bioengineering methods. Bio-engineering methods include live stakes, fascines, plantings, bare root stock, willow waddles, and live stakes. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. Typical stream has 50 foot bottom width and 6 foot banks. Length of area 100 feet. Planting entire area at a 2x2 grid with live stakes, potted plants, and bare root mix

Before Situation:

Bed of an existing or newly constructed alluvial or threshold channel is undergoing damaging aggradation or degradation. Stream cannot be feasibly controlled with clearing and snagging, vegetation, bank protection or upstream water control. Soil Erosion:

After Situation:

Stream channel is stable and vegetated. Other associated practices could be (326) Clearing and Snagging, (396) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Area of planting

Scenario Unit: Square Foot

Scenario Typical Size: 2,500.0

Scenario Total Cost: $14,046.26

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 584 - Channel Bed Stabilization

Scenario: #2 - Rock structures

Scenario Description:

Stabilize the bottom and slope of a stream channel using rock riprap or engineered products that consist primarily of rock or concrete. This includes but not limited to gabions, rock veins, rock weirs, concrete blocks, etc. Typical stream has 50 foot bottom width and 6 foot banks. Length of area 100 feet. Based on degrading channel that needs to be riprapped its entire wetted perimeter.

Before Situation:

Bed of an existing or newly constructed alluvial or threshold channel is undergoing damaging aggradation or degradation. Changes cannot be controlled feasibly with clearing and snagging, vegetation, bank protection or upstream water control. Soil Erosion:

After Situation:

Stream channel is stable. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. Other associated practices could be (326) Clearing and Snagging, (396) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Area to be stabilized.

Scenario Unit: Cubic Yard

Scenario Typical Size: 575.0

Scenario Total Cost: $97,567.10

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $169.68

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 584 - Channel Bed Stabilization

Scenario: #3 - Wood structures

Scenario Description:

Stabilize the bottom and slope of a stream channel using engineered structures consisting primarily of wood. This includes but not limited to toe wood, log weirs, log vanes, root wads, log step pools, etc. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. Typical stream has 50 foot bottom width and 6 foot banks. Length of area 100 feet. Structures spaced at 50 foot intervals.

Before Situation:

Bed of an existing or newly constructed alluvial or threshold channel is undergoing damaging aggradation or degradation. Changes cannot be controlled feasibly with clearing and snagging, vegetation, bank protection or upstream water control. Soil Erosion:

After Situation:

Stream channel is stable. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. Other associated practices could be (326) Clearing and Snagging, (396) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Number of structures

Scenario Unit: Each

Scenario Typical Size: 3.0

Scenario Total Cost: $15,148.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,049.59

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 584 - Channel Bed Stabilization

Scenario: #4 - Structural- J Hook, Cross Vane, etc. requiring boulders

Scenario Description:

Stabilize Channel to prevent degradation and excessive erosion creating excessive sediment and stream water quality degradation by constructing in stream in channel components such as J-Hooks, Vanes, Cross Vanes or Combo Root Wad/Log Vane and J-Hook structures. The purpose of this practice is to maintain, improve, and restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Scenario: Install 2 J hooks on 500 ' section of 100 SM watershed channel, where the bankfull depth is 8.0' and the J hook is as high as 1/2 bankfull or 4.0'. Each J hook develops an average pool depth of 8.0'and have a arm length of 130' long with a 53' long (7' deep) hook. Boulders are an average dimension of 3'x2.5'x2' and weigh 1,800#s. 225 boulders are required for one structure. Payment does not include cost of channel low bank shaping (assumed this is covered in either vegetative or bioengineered scenario). Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

Before Situation:

The unstable channel is trying to redefine it's normal meander and reduce erosive forces by vertical and laterally moving into a landowners field at an accelerated rate. The stream has severely degraded streambanks that are unstable and show signs of acti

After Situation:

Stream channel is stable. Other associated practices could be (326) Clearing and Snagging, (396) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: <Unknown>

Scenario Unit: Cubic Yard

Scenario Typical Size: 250.0

Scenario Total Cost: $57,011.40

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $228.05

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 585 - Stripcropping

Scenario: #1 - Erosion, Wind and Water

Scenario Description:

This scenario describes the implementation of a strip cropping system that is designed specifically for the control of wind and water erosion or minimizing the transport of sediments or other water borne contaminants originating from runoff on cropland. The planned strip cropping system will meet the current 585 standard. Implementation will result in alternating strips of erosion susceptible crops with erosion resistant crops that are oriented as close to perpendicular to water flows as possible. The designed system will reduce erosion/sediment/contaminants to desired objectives. The scenario includes the costs of designing the system, installing the strips on the landscape appropriately, and integrating a crop rotation that includes water erosion resistant species.

Before Situation:

In this geographic area, excessive water erosion is caused by raising crops in a manner that allows sheet water flows to travel down the slope causing sheet and rill erosion or concentrated flow conditions, degradation of soil health through loss of topso

After Situation:

A strip cropping system that includes at least two or more strips within the planning slope will be designed to include parallel strips of approximately equal widths of water erosion resistant crop species with non-water erosion resistant crop species. Widths will be determined using current water erosion prediction technology to meet objectives. The design and implementation of a stripcropping system will minimize wind, sheet and rill erosion, protect soil quality, reduce offsite sedimentation, and benefit offsite aquatic wildlife habitat. Erosion prediction before and after practice application will be recorded showing the design and benefits of the practice. Erosion resistant strips in rotation must be managed to maintain the planned vegetative cover and surface roughness.

Feature Measure: area of strips

Scenario Unit: Acre

Scenario Typical Size: 80.0

Scenario Total Cost: $180.71

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #1 - Inlet Flashboard Riser, Metal (Region)

Scenario Description:

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at the inlet (Half-Rounds). They are often fabricated from half pipes (i.e. half-rounds) or sheet steel in a box shape. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a "Half-Round" flashboard riser shop fabricated using a longitudinal cut 42" smooth steel pipe, a 50' long - 30" outlet pipe passing through an embankment.

Before Situation:

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in)

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 2,100.0

Scenario Total Cost: $26,843.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #2 - Flashboard Riser w/ Single Headwall

Scenario Description:

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at the inlet (Half-Rounds). They are often fabricated from half pipes (i.e. half-rounds) or sheet steel in a box shape. They can also be fabricated from vertical pipes with the stoplogs are located in the middle (i.e. Full-Rounds) and are called in-line structures. This scenario also includes a headwall installed on either the upstream or downstream section of the barrel. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a "Half-Round" flashboard riser shop fabricated using a longitudinal cut 42" smooth steel pipe, a 50' long - 30" outlet pipe passing through an embankment (weir (42) x barrel length (50) = 2100) with a headwall.

Before Situation:

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), Wetland Wildlife Habitat Management (644), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in)

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 2,100.0

Scenario Total Cost: $35,985.96

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $17.14

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #3 - Flashboard Riser w/ Double Headwall

Scenario Description:

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at the inlet (Half-Rounds). They are often fabricated from half pipes (i.e. half-rounds) or sheet steel in a box shape. They can also be fabricated from vertical pipes with the stoplogs are located in the middle (i.e. Full-Rounds) and are called in-line structures. This scenario also includes two headwalls, one installed on the upstream and one installed on the downstream section of the barrel. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a "Half-Round" flashboard riser shop fabricated using a longitudinal cut 42" smooth steel pipe, a 50' long - 30" outlet pipe passing through an embankment (weir (42) x barrel length (50) = 2100) with two headwalls.

Before Situation:

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), Wetland Wildlife Habitat Management (644), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in)

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 2,100.0

Scenario Total Cost: $45,791.38

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $21.81

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #4 - Inline Flashboard Riser, Metal (Region)

Scenario Description:

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at the embankment. They are often fabricated from vertical pipes with the stoplogs are located in the middle (i.e. Full-Rounds) or sheet steel in a box shape. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a "Half-Round" flashboard riser shop fabricated using a longitudinal cut 36" smooth steel pipe, a 50' long - 30" outlet pipe passing through an embankment.

Before Situation:

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in)

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 1,800.0

Scenario Total Cost: $9,710.84

Total Cost per Unit: $5.39

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #5 - Commercial Inline Flashboard Riser (Region)

Scenario Description:

An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. There are commercially available models composed of plastic that are commonly used when the width of the is 24" or less. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 20", height of six feet, The pipe is 50' of 15" SCH 40 PVC (inlet and outlet combined).

Before Situation:

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

After Situation:

A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in)

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $8,042.72

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.04

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #6 - Culvert <30 inches HDPE

Scenario Description:

Install a new HDPE culvert under 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 24 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic. Use (578) Stream Crossing for culverts ≥ 30 inches or perennial flow.

Before Situation:

Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

After Situation:

Water is conveyed in a controlled manner. Associated practices could be Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

Feature Measure: Pipe Diameter (In) x Pipe Le

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 960.0

Scenario Total Cost: $3,435.65

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.58

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #7 - Culvert <30 inches CMP

Scenario Description:

Install a new Corrugated Metal Pipe (CMP) culvert under 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 24 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic. Use (578) Stream Crossing instead for culverts ≥ 30 inches or perennial flow.

Before Situation:

Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

After Situation:

Water is conveyed in a controlled manner. Associated practices could be Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

Feature Measure: Pipe Diameter (In) x Pipe Le

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 960.0

Scenario Total Cost: $3,659.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.81

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #8 - Slide Gate

Scenario Description:

This scenario is the installation of a permanent slide gate structure to control the conveyance of water. The typical size is a 4' diameter opening. The slide gate may be installed on an open channel or pipeline. The slide gate is made of steel and has a hand operated mechanical lifting system, i.e. screw. This scenario assists in addressing the resource concerns: water management. Conservation practices that may be associated are: 533-Pumping Plant.

Before Situation:

A channel or pipeline is in need of a head gate to control the flow of water.

After Situation:

A 4' slide gate is installed and operated by hand is installed.

Feature Measure: diameter

Scenario Unit: Foot

Scenario Typical Size: 4.0

Scenario Total Cost: $10,082.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,520.54

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #9 - Flap Gate (Region)

Scenario Description:

This scenario is the installation of a permanent flap (tide) gate structure to control the direction of flow resulting from tides or high water or back-flow from flooding. The typical size is a 1.5' diameter opening. The gate may be installed on an open channel or pipeline. It is made of aluminum and operates automatically. This scenario assists in addressing the resource concerns: water management. Conservation practices that may be associated are:

Before Situation:

A wetland or other area is in need of a flap gate to control the direction of the water.

After Situation:

A flap gate 1.5' wide is installed.

Feature Measure: Feet Diameter (of Gate)

Scenario Unit: Foot

Scenario Typical Size: 1.5

Scenario Total Cost: $2,833.76

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,889.17

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #10 - Large Flap Gate w/ Headwall

Scenario Description:

Install an aluminum cut off wall with tide gate at the outlet of a channel. A typical scenario would be installed in a 25 foot channel, 6 foot deep, with 2:1 side slopes. A aluminum wall will extend 2.5 feet on each side, and include a 4' flap gate structure to control flooding. Work includes site preparation, forming and pouring concrete, backfilling and acquiring and installing the tide gate.

Before Situation:

Tides or flooding inundate and affect water quality of wetlands or other managed systems.

After Situation:

Tide or flood inundation is controlled. Associated practices could be Aquaculture Ponds (397), Aquatic Organism Passage (396), Bivalve Aquaculture Gear and Biofouling Control (400), Constructed Wetland (656), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Field Ditch (388), Irrigation System, Surface and Subsurface (443), Irrigation Water Management (449), Salinity and Sodic Soil Management (610), Subsurface Drain (606), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), Wetland Creation (658), Wetland Enhancement (659), Wetland Restoration (657), and Wetland Wildlife Habitat Management (644).

Feature Measure: Foot Diameter of Gate

Scenario Unit: Foot

Scenario Typical Size: 4.0

Scenario Total Cost: $14,773.15

Total Cost per Unit: $3,693.29

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #11 - Rock Checks for Water Surface Profile

Scenario Description:

Typical setting is in a stream that has become incised and is therefore disconnected from the floodplain. Typical installation consists of installing a "Vee" shaped rock structures with points facing upstream for the purpose of raising the water surface profile. Cost estimate is for three check dams with a top width of 3', max height of 6', min height of 3', and 28' length; containing an average of 58 cubic yards or 29 tons of rock for a total of 87 tons. The check dams are underlain with geotextile fabric. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

Before Situation:

The stream presently is incised with near vertical banks caused by bank toe erosion and sloughing. This condition has caused the floodplains to be disconnected from the stream, with only floods well above normal high-water escaping the high banks of the s

After Situation:

Banks are stabilized, and pools are created raising the Water Surface Profile elevation and effectively reducing the slope. Riffle pool scheme is restored and banks are protected. Water quality is protected downstream due to erosion protection, and wetland features are restored in the floodplain. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Streambank and Shoreline Protection (580), Channel Bed Stabilization (584), Stream Habitat Improvement and Management (395), and Wetland Wildlife Habitat Management (644) will use the corresponding Standard(s) as appropriate.

Feature Measure: Tons of rock installed

Scenario Unit: Ton

Scenario Typical Size: 87.0

Scenario Total Cost: $10,412.68

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $119.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #12 - In-Stream Structure for Water Surface Profile - Concrete

Scenario Description:

Typical setting is in a stream that has become incised and is therefore disconnected from the floodplain. Typical installation consists of installing a "Vee" shaped concrete structure which points facing upstream for the purpose of raising the water surface profile. Cost estimate is for one cross vane with a effective length (Streambed width) of 36', and total length of 65', effective height of 3', max height of 6', and a 3' by 1.5' footer; containing 19 cubic yards of Concrete. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

Before Situation:

The stream presently is incised with near vertical banks caused by bank toe erosion and sloughing. This condition has caused the floodplains to be disconnected from the stream, with only floods well above normal high-water escaping the high banks of the s

After Situation:

Banks are stabilized, and pools are created raising the water surface elevation and effectively reducing the slope. Riffle pool scheme is restored and banks are protected. Water quality is protected downstream due to erosion protection, and wetland features are restored in the floodplain. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Streambank and Shoreline Protection (580) Channel Bed Stabilization (584), Stream Habitat Improvement and Management (395), and Wetland Wildlife Habitat Management (644) will use the corresponding Standard(s) as appropriate.

Feature Measure: Streambed Width

Scenario Unit: Foot

Scenario Typical Size: 36.0

Scenario Total Cost: $12,707.84

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $353.00

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #13 - In-Stream Structure for Water Surface Profile - Rock

Scenario Description:

Typical setting is in a stream that has become incised and is therefore disconnected from the floodplain. Typical installation consists of installing a "Vee" shaped rock structure which points facing upstream for the purpose of raising the water surface profile. Cost estimate is for one cross vane with a effective length (Streambed width) of 36', and total length of 75', effective height of 3' (5ft total height) and width of 5 ft. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

Before Situation:

The stream presently is incised with near vertical banks caused by bank toe erosion and sloughing. This condition has caused the floodplains to be disconnected from the stream, with only floods well above normal high-water escaping the high banks of the s

After Situation:

Banks are stabilized, and pools are created raising the water surface elevation and effectively reducing the slope. Riffle pool scheme is restored and banks are protected. Water quality is protected downstream due to erosion protection, and wetland features are restored in the floodplain. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Streambank and Shoreline Protection (580) Channel Bed Stabilization (584), Stream Habitat Improvement and Management (395), and Wetland Wildlife Habitat Management (644) will use the corresponding Standard(s) as appropriate.

Feature Measure: Tons of Riprap

Scenario Unit: Ton

Scenario Typical Size: 116.0

Scenario Total Cost: $12,533.41

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $108.05

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #17 - Flow Meter with Mechanical Index

Scenario Description:

Permanently installed water flow meter with mechanical, cumulative volume and rate index. Meters can be any flow measurement device that meets CPS 433, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data at the meter location. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit: Inch

Scenario Typical Size: 10.0

Scenario Total Cost: $2,234.32

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $223.43

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #18 - Flow Meter with Electronic Index

Scenario Description:

Permanently installed water flow meter with an electronic index . Meters can be any flow measurement device that meets CPS 433, (i.e., meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes or data logging capability. Meter nominal diameter for insert type turbine meters will be installation pipe size. Typical installation would include installation of a 10 inch turbine flow meter, with electronic index output. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waster Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data at the meter location. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit: Inch

Scenario Typical Size: 10.0

Scenario Total Cost: $4,288.75

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $428.88

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #19 - Flow Meter with Electronic Index & Telemetry

Scenario Description:

Permanently installed water flow meter with an electronic flow rate and volume index and data telemetry transmission system. Meters can be any flow measurement device that meets CPS 433, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes. Meter nominal diameter for insert type turbine meters will be installation pipe size. Typical installation would include installation of a 10 inch magnetic flow meter, with electronic index output and telemetry data transfer system for monitoring irrigation system flow rate. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data from a personal computer or cell phone at any time. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit: Inch

Scenario Typical Size: 10.0

Scenario Total Cost: $5,879.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $587.95

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #276 - Water Bar

Scenario Description:

Construction of a water bar or broad-based dip across an existing passageway to prevent down gradient erosion due to sheet flow or concentrated flow from rill erosion. Typical dimensions of water control structure are 1.5' high, 12' width (4:1 side slopes), and 20' in length across the passageway. Structure also includes a 12' wide x 20' long x 0.5' deep layer of gravel to protect the flow path of water across passageways.

Before Situation:

Extensive erosion is occurring along the passageway causing soil erosion and water quality resource concerns.

After Situation:

Water bars are installed along the slope of the passageway as required to reduce the slope length, reduce the velocity of water, and to prevent sheet and rill erosion from occurring. Installed water bars intercept and divert the water away from the passageway.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,326.70

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,326.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #340 - Automated DWM Control Structure, 12 to 18 inch diameter pipe

Scenario Description:

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) that outlets through a control structure which is operated with an automated slide gate and accommodates 12 to 18 inch diameter pipe sizes. This structure configuration facilitates meeting the conservation practice standard 554 - Drainage Water Management by managing the subsurface water table year-round. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil for crop health or field operations. This retention time reduces the volume of water discharged and thereby the quantity of nutrients lost. A single automated structure may have its influence extended by buried float-activated structures to provide a greater area of control. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

Before Situation:

Uncontrolled discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.

After Situation:

The water surface profile in the subsurface drainage system is managed in a manner which retains moisture in the soil for plant update and to allow for enhanced nutrient utilization. The use of automated control structures allow water levels to be monitored and adjusted remotely to allow for more active management in accordance with the drainage systems Drainage Water Management plan. Typical affected area for a single structure is 10 to 20 acres. A single structure with an automated slide gate may have its influence extended by use of buried float-activated control structures.

Feature Measure: Number of Structures

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $12,325.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12,325.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #356 - Automation Retrofit to Manual Drainage Water Management Control Structure

Scenario Description:

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) that outlets through a control structure which has been retrofitted to operate with an automated slide gate. This structure configuration facilitates meeting the conservation practice standard 554 - Drainage Water Management by managing the subsurface water table year-round. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil for crop health or field operations. This retention time reduces the volume of water discharged and thereby the quantity of nutrients lost. A single retrofitted automated retrofit structure may have its influence extended by buried float-activated structures to provide a greater area of control. Resource Concerns: Field Sediment, Nutrient and Pathogen Loss. Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management.

Before Situation:

Control structure with manually operated slide gate.

After Situation:

The water surface profile in the subsurface drainage system is managed in a manner which retains moisture in the soil for plant update and to allow for enhanced nutrient utilization. The use of retrofitted control structures for automated slide gate operation allow water levels to be monitored and adjusted remotely to allow for more active management in accordance with the drainage systems Drainage Water Management plan. Typical affected area for a single structure is 10 to 20 acres. A single structure with a retrofitted automated slide gate may have its influence extended by use of buried float-activated control structures.

Feature Measure: Number of Structures

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,989.21

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,989.21

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #413 - CMP Turnout

Scenario Description:

A corrugated metal pipe (CMP) equipped with a slide gate diverts water from a ditch or canal into a field or field ditch. This scenario is for a 15 inch diameter gate and pipe that will transmit approximately 4 cfs of flow.

Before Situation:

A ditch or canal exists, but a means to move water from the ditch into a smaller ditch or field does not exist. A water supply of sufficient quantity and quality is available for irrigation.

After Situation:

Water is diverted from a canal or ditch to meet irrigation requirements. A 15 inch diameter CMP is installed through the canal containment dike,. A 15 inch diameter slide gate is attached to the upstream end of the pipe. The top of the pipe inlet is below canal water surface elevation.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,651.49

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,651.49

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #414 - Concrete Turnout Structure - Small

Scenario Description:

A reinforced concrete turnout structure equipped with slide boards or panels diverts irrigation water from a ditch or canal into a field or field ditch. This scenario is for a four ft tall, two foot wide, and five foot long turnout structure.

Before Situation:

A ditch or canal exists, but a means to move water from the ditch into a smaller ditch or field does not exist. A water supply of sufficient quantity and quality is available for irrigation.

After Situation:

Water is diverted from a canal or ditch to meet irrigation requirements. A two foot wide and four foot tall turnout structure equipped with slots for slide boards and panels conducts water through the canal berm into a field. The concrete structure is five feet long and has an end sill. All footings, floors. and walls have a minimum thickness of six inches. The structure delivers water to field elevation or ditch bottom elevation. The top of the pipe inlet is below canal water surface elevation.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,062.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,062.81

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #415 - Concrete Turnout Structure

Scenario Description:

A reinforced concrete turnout structure equipped with a 48 inch screw gate diverts irrigation water from a canal into a field or field ditch. This scenario is for a six ft tall, eight foot wide, and ten foot long turnout structure. A sloping trash rack fabricated from rebar is installed on the inlet. If needed fish screens may be installed at the inlet..

Before Situation:

A delivery canal exists, but a means to move water from the canal into a smaller ditch or field does not exist. A water supply of sufficient quantity and quality is available for irrigation.

After Situation:

Water is diverted from a canal to meet irrigation requirements. A eight foot wide and six foot tall turnout structure equipped with a 48 inch slide gate conducts water through the canal berm. The concrete structure is ten feet long and has an end sill. All footings, floors. and walls have a minimum thickness of six inches. The structure delivers water to field or ditch bottom elevation.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $13,474.90

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13,474.90

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #418 - Automated DWM Control Structure, 6 to 10 inch diameter pipe

Scenario Description:

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) that outlets through a control structure which is operated with an automated slide gate and accommodates 6 to 10 inch diameter pipe sizes. This structure configuration facilitates meeting the conservation practice standard 554 - Drainage Water Management by managing the subsurface water table year-round. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil for crop health or field operations. This retention time reduces the volume of water discharged and thereby the quantity of nutrients lost. A single automated structure may have its influence extended by buried float-activated structures to provide a greater area of control. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

Before Situation:

Uncontrolled discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.

After Situation:

The water surface profile in the subsurface drainage system is managed in a manner which retains moisture in the soil for plant update and to allow for enhanced nutrient utilization. The use of automated control structures allow water levels to be monitored and adjusted remotely to allow for more active management in accordance with the drainage systems Drainage Water Management plan. Typical affected area for a single structure is 10 to 20 acres. A single structure with an automated slide gate may have its influence extended by use of buried float-activated control structures.

Feature Measure: Number of Structures

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,287.44

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,287.44

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #559 - Pond Siphon, Normal Pool Surface Area Less Than or Equal to 10 Ac

Scenario Description:

Pond Siphon constructed of Sched. 40 PVC that is permanently installed on an existing pond embankment (i.e. placed on top of existing embankment and not trenched in and only minor embankment disturbance). Pond has principal and auxiliary spillways that are operating and can handle design storm flows safely and has stable outlet. The typical siphon is 6 inch PVC pipe and fittings. Siphon has an inlet that is placed a minimum of 3 feet up to 5 feet below normal pool level with a planned drawdown of 2 feet to 5 feet in 72 hours (3-day forecast window) with valves for filling/operation and screen inlet to prevent clogging. Outlet pipe runs down outer embankment to a stabilized outlet/plunge pool/410 structure. The pipe on embankment has a tee fitting that is used to fill siphon. Pipe anchored to embankment and blocked as needed to match siphon elbows (typically 22.5 degree elbows) and pipe sections to existing embankment slopes. Typical pond surface area 4 acres (420 feet x 420 feet), assume 2.5:1 side slopes. To drawdown 1 foot in 24 hours, flow rate of approximately 2 cfs required; a 6 inch siphon operating at approximately 7 feet of head should deliver 2 cfs based on siphon calculator. Associated practices include: Critical Area Planting (Code 342), Pond (Code 378), Grade Stabilization Structure (Code 410)

Before Situation:

Low hazard, agricultural pond currently has only principal and/or auxiliary spillway structures that can handle typical design storms. No current provisions or appurtenances to drain pond prior to hurricane or large precipitation events. Pond could easily

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby utilizing the pond for localized, enhanced flood prevention and stormwater retention. The system allows for management of pond levels, particularly when hurricanes are forecast. Expected potential drawdown is 2 feet to 5 feet for 3-days of continuous operation; the typical, accurate forecast availability is 3 days. Chances of embankment overtopping significantly reduced with enhanced tools for pond water management. Associated practices include: Critical Area Planting (Code 342), Pond (Code 378), Grade Stabilization Structure (Code 410)

Feature Measure: each siphon properly install

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,144.34

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,144.34

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 587 - Structure for Water Control

Scenario: #560 - Pond Siphon, Normal Pool Surface Area Greater than 10 Ac

Scenario Description:

Pond Siphon constructed of Sched. 40 PVC that is permanently installed on an existing pond embankment (i.e. placed on top of existing embankment and not trenched in and only minor embankment disturbance). Pond has principal and auxiliary spillways that are operating and can handle design storm flows safely and has stable outlet. The typical siphon is 10 inch PVC pipe and fittings. Siphon has an inlet that is placed a minimum of 3 feet up to 5 feet below normal pool level with a planned drawdown of 2 feet to 5 feet in 72 hours (3-day forecast window) with valves for filling/operation and screen inlet to prevent clogging. Outlet pipe runs down outer embankment to a stabilized outlet/plunge pool/410 structure. The pipe on embankment has a tee fitting that is used to fill siphon. Pipe anchored to embankment and blocked as needed to match siphon elbows (typically 22.5 degree elbows) and pipe sections to existing embankment slopes. Typical pond surface area 12 acres (840 feet x 630 feet), assume 2.5:1 side slopes. To drawdown 1 foot in 24 hours, flow rate of approximately 6 cfs required; a 10 inch siphon operating at approximately 7 feet of head should deliver 6 cfs based on siphon calculator. Associated practices include: Critical Area Planting (Code 342), Pond (Code 378), Grade Stabilization Structure (Code 410)

Before Situation:

Low hazard, agricultural pond currently has only principal and/or auxiliary spillway structures that can handle typical design storms. No current provisions or appurtenances to drain pond prior to hurricane or large precipitation events. Pond could easily

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby utilizing the pond for localized, enhanced flood prevention and stormwater retention. The system allows for management of pond levels, particularly for when hurricanes are forecast. Expected potential drawdown is 2 feet to 5 feet for 3-days of continuous operation; the typical, accurate forecast availability is 3 days. Chances of embankment overtopping significantly reduced with enhanced tools for pond water management. Associated practices include: Critical Area Planting (Code 342), Pond (Code 378), Grade Stabilization Structure (Code 410).

Feature Measure: each siphon properly install

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $5,876.42

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,876.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 590 - Nutrient Management

Scenario: #8 - Adaptive NM

Scenario Description:

The practice scenario is for the implementation of nutrient management on a small plot, as detailed in outlined in Agronomy Technical Note 7 - Adaptive Nutrient Management. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement various nutrient use efficiency improvement methods for timing, rate, method of application, or source of nutrients.

Before Situation:

The practice will be installed on cropland (small grain rotation or typical corn-soybean rotation) to address water quality degradation, air quality degradation and energy concerns. The scenario applies to non-organic and organic operations.

After Situation:

Installation of this scenario will result in adopting the four R's of nutrient management following the procedures outlined in Agronomy Technical Note 7 - Adaptive Nutrient Management. Implementation involves establishing the replicated plots to evaluate one or more of the 4 R's. The plot will consist of at least 4 replicated plots designed, laid out, managed and evaluated with the assistance of a consultant or extension professional knowledgeable in nutrient management and experimental design and data collection. Results are used to make nutrient application decisions to address water quality degradation issues and nutrient use efficiencies. Yields will be measured and statistically analyzed and summarized following the procedures in Agronomy Technical Note 7. The yields for each plot will be adjusted to the appropriate moisture content.

Feature Measure: <Unknown>

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,183.01

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,183.01

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 590 - Nutrient Management

Scenario: #293 - Small Scale Basic Nutrient Management

Scenario Description:

This scenario applies to small farms with diversified cropping systems which will improve the current level of management in applying nutrients. Improved level of management will be such to prevent nonpoint source pollution of surface and ground waters. Typical size is less than 1.0 acre. This scenario includes hand-labor as well as equipment.

Before Situation:

Little to no soil or manure testing is being conducted and typically lacks a nutrient budget. Application of fertilizers, including manures and amendments, are conducted based upon traditional fertilizer recommendations from LGU or based on historic use r

After Situation:

Implementation Requirements have been developed to manage nutrients according to the criteria found in Nutrient Management (590) Conservation Practice Standard for either organic or non-organic operations as appropriate. A nutrient budget has been developed for each field or management zone. Nutrients are applied according to the 4 R's. (Right rate, Right time, Right place and Right source). Records needed to complete the nutrient budget are provided which may include variety of pre-season, in-season, and post-season soil nutrient and plant tissue tests and analysis; compost or manure tests; application timing, method and rate; nutrient sources; and yield data for each field or management zone. Nutrient runoff into adjacent streams is minimized improving water quality and preventing leaching into shallow ground water sources.

Feature Measure: planted area

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 43.0

Scenario Total Cost: $1,541.28

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $35.84

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 590 - Nutrient Management

Scenario: #319 - Precision Nutrient Application

Scenario Description:

The planned Precision Nutrient Application system will meet the current Nutrient Management (590) CPS General and Additional Criteria. The Application system will include soil sampling methodology for variable rate application and systems. Use of additional nutrient/soil tests including chlorophyll meters, and/or spectral analysis may be used to further refine nutrient applications. Management of nutrients is based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management (apply the right nutrient source at the right rate, time and place) including activities to reduce nutrient loss by Assessment of comprehensive, site-specific conditions within the field. Nutrient management intensity must be sufficient to address site-specific risk for nutrient loss. Payment for implementation is to defray the costs of Precision Nutrient Application system, equipment to implement the practice, implementation of the NMP and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Currently, a nutrient management system for the farm operation accounting for all know measurable nutrient sources does not exist or does not meet the Nutrient Management (590) CPS requirements for General and Additional Criteria. Management of nutrients

After Situation:

A Precision Nutrient Application system will be developed to meet the current Nutrient Management (590) CPS General and Additional Criteria with nutrient management intensity sufficient to address site-specific risks for nutrient loss. Development and implementation of the NM system is based on site-specific risk assessment of comprehensive, site-specific conditions for the application of nutrients for each nutrient loss pathway that can negatively impact soil, water and air quality with excess nutrient loss. The NM system utilizes the 4Rs of nutrient stewardship and SMART Nutrient Management – the right Source, right Method, right Rate, and right Timing to meet both plant productivity and natural resource conservation goals. Utilizing GIS and GPS technologies, nutrients are applied based on soil test results for each grid or management zone using automated variable rate application equipment. Records provided annually include, the current soil test reports, planned nutrient application rates for each grid or management zone (prescription maps) and/or as applied maps, source, timing, and placement of all nutrients applied, actual crop yields and/or generated yield maps.

Feature Measure: acres treated

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,374.18

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $84.35

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 590 - Nutrient Management

Scenario: #320 - Prescription Nutrient Efficiency

Scenario Description:

The planned Precision Nutrient Efficiency system will meet the current Nutrient Management (590) CPS general and additional criteria. Precision nutrient efficiency system involves the testing or evaluation of crop and/or soil during the growing season to more accurately determine if additional nutrient application(s) are needed. This includes methods or technologies such as PPSN (pre-plant soil nitrate test), PSNT (pre-side dress nitrogen test), LSNT (late spring soil nitrate test), CSNT (corn stalk nitrate test) and chlorophyll meters, and/or spectral analysis may be used to determine if additional nutrients are needed. Nitrification or urease inhibitors (as well as other Enhanced Efficiency Fertilizer technologies recognized by Land Grant Universities) may also be used. Payment for implementation is to defray the costs of additional soil and plant nutrient testing and analysis, in-season crop nutrient testing, equipment, labor, implementation of the NMP and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

This scenario takes a conventional cropping system where either no nutrient management or only a basic level of nutrient management is being practiced and improves it to address air quality (reduce emissions for N fertilizer) and/or minimize agricultural

After Situation:

A Precision Nutrient Management Efficiency system will be developed to meet the current Nutrient Management (590) CPS general and additional criteria. When applicable the system will also meet NOP (National Organic Program) regulations, including reducing nitrogen emissions. Implementation of the adopted efficiency system improves the 4R Stewardship installation which will reduce nutrient loss reducing the potential of off-site movement of nutrients. A nutrient budget is developed for each field or management zone annually for the crop rotation or sequence. The Nutrient Management Plan will include current soil test results, nutrient application rates, source, timing, and placement of all nutrients applied, risk assessments and actual crop yields. Record keeping includes documentation of as applied nutrients by field annually plus and State record keeping requirements.

Feature Measure: acres treated

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $2,446.03

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $61.15

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 590 - Nutrient Management

Scenario: #333 - Nutrient Management - Manure Incorporation

Scenario Description:

The scenario describes the development and implementation of a Nutrient Management Plan (NMP) which will meet the current Nutrient Management (590) CPS General as well Additional Criteria and utilizes manure as a nutrient source for crop production. Manure nutrient sources will be incorporated into the soil after application. This scenario is applicable for all manure nutrient sources (manure, compost and other organic sources of nutrients). Management of nutrients is based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management (apply the right nutrient source at the right rate, time and place) including activities to reduce nutrient loss by Assessment of comprehensive, site-specific conditions within the field. Nutrient management intensity must be sufficient to address site-specific risk for nutrient loss. Payment is to defray the costs of implementation of the NMP and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Currently, a nutrient management plan for the farm operation accounting for all know measurable nutrient sources does not exist or does not meet the Nutrient Management (590) CPS requirements for General and Additional Criteria. Management of nutrients is

After Situation:

A Nutrient Management Plan (NMP) is developed to meet the current Nutrient Management (590) CPS for General and Additional Criteria with nutrient management intensity sufficient to address site-specific risks for nutrient loss. Development and implementation of the NMP is based on site-specific risk assessment of comprehensive, site-specific conditions for the application of nutrients for each nutrient loss pathway that can negatively impact soil, water and air quality with excess nutrient loss. Manure applications are incorporated into the soil. The NMP utilizes the 4Rs of nutrient stewardship and SMART Nutrient Management – the right Source, right Method, right Rate, and right Timing to meet both plant productivity and natural resource conservation goals.

Feature Measure: Ac.

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $2,361.09

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $59.03

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 590 - Nutrient Management

Scenario: #334 - Nutrient Management - Manure Injection

Scenario Description:

The scenario describes the development and implementation of a Nutrient Management (NM) system which will meet the current Nutrient Management (590) CPS General as well as Additional Criteria and utilizes liquid manure as a nutrient source. Manure nutrients will be injected or placed subsurface. The system provides crop nutrient recommendations which accounts for the removal of nitrogen (N), phosphorus (P), and potassium (K). Management of nutrients is based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management (apply the right nutrient source at the right rate, time and place) including activities to reduce nutrient loss by Assessment of comprehensive, site-specific conditions within the field. Nutrient management intensity must be sufficient to address site-specific risk for nutrient loss. Payment is to defray the costs of implementation of the NM system, injection of manure nutrients and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Currently, a nutrient management system for the farm operation accounting for all know measurable nutrient sources does not exist or does not meet the Nutrient Management (590) CPS requirements for General and Additional Criteria. Liquid manure is current

After Situation:

A Nutrient Management (NM) system is developed and implemented to meet the current Nutrient Management (590) CPS for General and Additional Criteria, with nutrient management intensity sufficient to address site-specific risks for nutrient loss. Liquid manure applications are injected below the soil surface at appropriate depth according to the nutrient management system using manure injection equipment to reduce nitrogen loss through surface runoff, leaching and ammonia volatilization. Development and implementation of the NM system is based on site-specific risk assessment of comprehensive, site-specific conditions for the application of nutrients for each nutrient loss pathway that can negatively impact soil, water and air quality with excess nutrient loss. The NM system utilizes the 4Rs of nutrient stewardship and SMART Nutrient Management – the right Source, right Method, right Rate, and right Timing to meet both plant productivity and natural resource conservation goals.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $7,527.31

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $188.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 590 - Nutrient Management

Scenario: #385 - Nutrient Management

Scenario Description:

The scenario describes the development and implementation of a Nutrient Management (NM) system which will meet the current Nutrient Management (590) CPS General as well as Additional Criteria and utilizes synthetic fertilizer as well as animal manure as nutrient sources for crop production. The system provides crop nutrient recommendations which accounts for the removal of nitrogen (N), phosphorus (P), and potassium (K). Management of nutrients is based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management (apply the right nutrient source at the right rate, time and place) including activities to reduce nutrient loss by Assessment of comprehensive, site-specific conditions within the field. Nutrient management intensity must be sufficient to address site-specific risk for nutrient loss. Payment is to defray the costs of implementation of the NM system and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Currently, a nutrient management system for the farm operation accounting for all know measurable nutrient sources does not exist or does not meet the Nutrient Management (590) CPS requirements for General and Additional Criteria. Management of nutrients

After Situation:

A Nutrient Management (NM) system is developed and implemented to meet the current Nutrient Management (590) CPS for General and Additional Criteria, with nutrient management intensity sufficient to address site-specific risks for nutrient loss. Development and implementation of the NM system is based on site-specific risk assessment of comprehensive, site-specific conditions for the application of nutrients for each nutrient loss pathway that can negatively impact soil, water and air quality with excess nutrient loss. The NM system utilizes the 4Rs of nutrient stewardship and SMART Nutrient Management – the right Source, right Method, right Rate, and right Timing to meet both plant productivity and natural resource conservation goals.

Feature Measure: Ac.

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $1,586.58

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $39.66

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 590 - Nutrient Management

Scenario: #386 - Nutrient Management - Non-Organic

Scenario Description:

The scenario describes the development and implementation of a Nutrient Management (NM) system which will meet the current Nutrient Management (590) CPS General as well as Specific Criteria and utilizes synthetic fertilizers as sole nutrient source for crop production. The system provides crop nutrient recommendations which accounts for the removal of nitrogen (N), phosphorus (P), and potassium (K). Management of nutrients is based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management (apply the right nutrient source at the right rate, time and place) including activities to reduce nutrient loss by Assessment of comprehensive, site-specific conditions within the field. Nutrient management intensity must be sufficient to address site-specific risk for nutrient loss. Payment is to defray the costs of implementation of the NM system and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Currently, a nutrient management system for the farm operation accounting for all know measurable nutrient sources does not exist or does not meet the Nutrient Management (590) CPS requirements for General and Additional Criteria. Management of nutrients

After Situation:

A Nutrient Management (NM) system is developed and implemented to meet the current Nutrient Management (590) CPS for General and Additional Criteria, with nutrient management intensity sufficient to address site-specific risks for nutrient loss. Development and implementation of the NM system is based on site-specific risk assessment of comprehensive, site-specific conditions for the application of nutrients for each nutrient loss pathway that can negatively impact soil, water and air quality with excess nutrient loss. The NM system utilizes the 4Rs of nutrient stewardship and SMART Nutrient Management – the right Source, right Method, right Rate, and right Timing to meet both plant productivity and natural resource conservation goals.

Feature Measure: Ac.

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $1,184.65

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $29.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 591 - Amendments for Treatment of Agricultural Waste

Scenario: #1 - Litter Amendments for Air Quality With Partially Treated Brood Chamber

Scenario Description:

This practice scenario includes the application of a litter treatment amendment that is approved by NRCS to the entire poultry house to reduce ammonia emissions from the house and facilitate manure management. An entire poultry house is treated year round for air quality impacts. In the winter, the producer or integrator treats the brood chamber between flocks with litter amendments solely for bird health and production. The amount being applied by the producer or integrator in winter months does not meet the air quality resource concerns. Additional litter amendments are added in winter for Air Quality benefits not being applied by the integrator. Litter amendments are applied spring through fall for entire flocks. NRCS is not responsible for the litter amendments already being applied by the integrator for the purposes of production and bird health. The purpose of the practice is to address resource concerns related to air quality impacts due to particulate matter and precursors, and objectionable odors. Associated practices: Nutrient Management (590).

Before Situation:

No litter amendments are being applied during the spring through fall months. An amendment is being applied at a lower application rate during the winter months, typically half the house and only two flocks. Partial winter application is solely for produc

After Situation:

An NRCS approved amendment is applied between each flock. All flocks are optimally treated with litter amendments year-round. A typical broiler operation with 4 flocks in a 42’ x 500’ house (21,000 square feet) is treated to reduce the impacts on air quality. Typically 100 pounds of litter amendments per 1000 square feet are applied 4 times annually. The total amendment applied is adjusted by 81.3% to account for the portion of the brood chamber that is receiving partial application during the winter months. The amendment is proven to control the odor, to reduce ammonia emissions from the litter. The selected amendment is applied in conformance with the manufacturer’s recommendations and the rates required. The resulting litter contains higher levels of nutrients and nutrient management plans must account for this. Nutrient level testing of the litter and nutrient planning shall be in conformance with CPS Nutrient Management, Code 590. The amendment successfully addresses the air quality impacts from objectionable odors, ammonia emissions, PM and PM precursors and bird health resource concerns. Formula to calculate the number of 1000 SF units: (Square Feet of house) / 1000 SF X (Number of houses) X (Number of applications/year) = Number of 1000SF/year. 21,000 SF / 1000 SF X 1 house X 4 app/yr = 84 units of 1000SF

Feature Measure: Number of 1000SF applicati

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 84.0

Scenario Total Cost: $2,964.91

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $35.30

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 591 - Amendments for Treatment of Agricultural Waste

Scenario: #3 - Litter Amendments applied for Air Quality resource concerns

Scenario Description:

This practice scenario includes the application of a litter treatment amendment that is approved by NRCS to the entire poultry house to reduce ammonia emissions from the house and facilitate manure management. The amendment used is proven to reduce ammonia levels in the house by transforming nitrogen into a form of ammonium. The purpose of the practice is to address resource concerns from existing nutrient levels that may contribute to air quality impacts such as objectionable odors and ammonia emissions and impacts on bird health due to excess nutrients and pathogens. Associated practices: Nutrient Management (590).

Before Situation:

Integrator does not currently apply waste treatment amendments to the litter that reduce ammonia emissions.

After Situation:

This scenario is based on a typical poultry operation with a 2-house facility and each house size is 40' x 400', 16,000 SF. An NRCS approved amendment is applied between flocks, 5 flocks annually, at rate required to meet air quality resource concern, typically 100 pounds per 1000 SF. Formula to calculate the amount of amendment per year on a 1000 SF basis: (Square Feet of house) / 1000 SF X (Number of houses) X (Number of Applications per Year)= Number of 1000SF. 16,000 SF / 1000 SF X 2 houses X 5 applications/year= 160 units of 1000SF An NRCS approved amendment is applied between each flock, 5 applications, at rate required for treatment to address air quality resource concerns. For most products, this is 100 pounds per 1000 SF. The amendment is proven to control the odor, and to reduce ammonia emissions. The selected amendment is applied in conformance with the manufacturer's recommendations and the rates required. The resulting litter contains higher levels of nutrients and nutrient management plans must account for this. Nutrient level testing of the litter and nutrient planning shall be in conformance with CPS Nutrient Management, Code 590. The amendment successfully addresses the air quality impacts of objectionable odors, ammonia emissions, PM and PM precursors and bird health resource concerns.

Feature Measure: Number of 1000SF applicati

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 160.0

Scenario Total Cost: $6,976.26

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $43.60

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 592 - Feed Management

Scenario: #18 - Animal Group

Scenario Description:

Feed ration management on an animal operation that does not have access to enough acres to spread all of its manure nutrients at an agronomic rate. The resource concerns are water quality degradation, excessive manure nutrients, particularly nitrogen and phosphorus. The goal of the practice is to reduce the amount of nutrients in the raw manure so that it is easier for “landlocked” farmers to apply the manure at agronomic rates, thereby reducing or eliminating water quality degradation concerns. Associated practices: Nutrient Management (590), Prescribed Grazing (528), Forage Harvest Management (511).

Before Situation:

Producer is feeding a higher level of protein and/or phosphorus than is needed to meet National Research Council (NRC) recommendations for a group of animals of this type and at this stage of production. The operation does not have all of the available ac

After Situation:

The scenario assumes that a specific group of animals is being evaluated. A baseline analysis of 4 samples each with 4 quarterly reports of manure, and feed will be completed to determine the current inputs and outputs. The producer will reduce feed protein and phosphorus levels to that of NRC recommendations for a group of animals of this type and at this stage of production. The producer will explore alternative feedstuffs and alternative feeding strategies to bring manure nitrogen and/or phosphorus levels down without hurting production of the animals or profitability of the operation. Alternative feeding strategies can include such things as grouping animals by similar age, sex, or stage of production, feeding based on individual rolling average production, or feeding “homegrown” or local feedstuffs.

Feature Measure: Group

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,411.04

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,411.04

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 592 - Feed Management

Scenario: #34 - Feed Additive

Scenario Description:

Feed ration management on an animal operation by inclusion of a feed additive. The resource concerns may be water quality degradation (pathogens, soluble nutrients), air quality (odors, green house gas). The goal of the practice is to add an approved feed additive that has been proven to reduce pathogens, or tie up soluble nutrients, or improve air quality by reducing odors, ammonia, or green house gases to the animal diet. For this scenario, zeolite will be added to beef and dairy rations to reduce ammonia emissions. Associated practices: Nutrient Management (590).

Before Situation:

Producer is feeding a balanced diet to his animals. He knows that the diet, however is leading to resource concerns by soluble nutrients or pathogens entering the surface water from his operation, or that odors, NOx, or Methane are affecting air quality.

After Situation:

The scenario assumes that a specific group of animals is being evaluated for a resource concern, and that a proven feed additive can have an effect on that concern. For this particular scenario, a zeolite is added to a beef or dairy ration at a rate of 2% of the daily ration. The zeolite will absorb ammonia and other compounds, resulting in lower nitrogen excretion and thus lower ammonia emissions from the manure and result in improved air quality. Assume that one hour of general labor will be needed per year per animal unit to load/unload zeolite into feed mixing equipment. Assume that the zeolite is added based on a 2% inclusion rate of the dry matter ration of 25 pounds/day/animal unit or the amount of zeolite needed is 0.5 pounds/day/animal unit or about 0.1 tons/year/animal unit.

Feature Measure: Per Animal unit, per year

Scenario Unit: Animal Unit

Scenario Typical Size: 1.0

Scenario Total Cost: $66.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $66.73

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 595 - Pest Management Conservation System

Scenario: #69 - Plant Health PAMS (acs) Low Labor and Materials

Scenario Description:
PAMS activities with low labor and material costs will be implemented on a large scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an ident

After Situation:
Planned Prevention (resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Acres of Management Appli

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $895.11

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $22.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 595 - Pest Management Conservation System

Scenario: #70 - Plant Health PAMS (acs) Low labor only

Scenario Description:
PAMS activities with low labor costs will be implemented on a large scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an ident

After Situation:
Planned Prevention (resistant cultivar selection, pest habitat removal, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Acres of management appli

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $640.99

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $16.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 595 - Pest Management Conservation System

Scenario: #71 - Pest Management Precision Ag

Scenario Description:

This scenario takes a conventional cropping system where either no pest management or only a basic level of pest management is being practiced and improves it to address air quality and/or minimize agricultural nonpoint sources pollution of surface and groundwater. The planned Pest Management system will meet the current Pest Management Conservation System (595) CPS general and additional criteria. Precision pest management system includes such items as pest monitoring, targeted applications, eliminates overlap, tissue testing, specialized nozzles etc. to further refine pesticide applications. Payment for implementation is to defray the costs of tissue testing, additional testing and analysis, equipment implementation of the PMCS and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Conventional pest management programs involve little or no monitoring and testing. Application of pesticides are completed annually based upon product salesmen recommendations that do not specifically consider the detrimental affects of inexact applicatio

After Situation:

A precision pest management system will be developed to meet the current Pest Management Conservation System (595) CPS general and additional criteria, when applicable the system will also meet NOP regulations. Development and implementation of a PMCS will benefit plant productivity while reducing potential of off-site movement of pesticides. PMCS may include practices such as use of spot applications, proper timing of applications, more appropriate formulations etc. Additional monitoring and tissue testing may also be used to further refine pesticide applications. Smart sprayer and advanced nozzle technology may also be employed. Records will be provided annually of the current monitoring, test analysis, application rates, formulations for each field including crop yields.

Feature Measure: Acres of management appli

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $2,628.72

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $65.72

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 595 - Pest Management Conservation System

Scenario: #72 - Plant Health PAMS activities (Small Farm - each) labor, materials and mitigation.

Scenario Description:
PAMS activities with labor and material costs plus mitigation will be implemented on a small scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an ident

After Situation:
Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation over 30 points.

Feature Measure: Small farm, typically = 5Ac

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $6,673.35

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,673.35

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 595 - Pest Management Conservation System

Scenario: #75 - Plant Health PAMS (acs) High Labor, materials and mitigation.

Scenario Description:

PAMS activities with high labor and material costs (weather station, netting, field sanitation, mating disruption) plus mitigation will be implemented on a large scale crop production area.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an ident

After Situation:

Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation over 30 points.

Feature Measure: Acres of management appli

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $21,938.53

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $548.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 595 - Pest Management Conservation System

Scenario: #76 - Plant Health PAMS (acs) Low Labor, materials and mitigation.

Scenario Description:
PAMS activities with low labor and material costs will be implemented plus mitigation on a large scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an ident

After Situation:
Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation up to 30 points.

Feature Measure: Acres of Management Appli

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $2,479.68

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $61.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 595 - Pest Management Conservation System

Scenario: #78 - Plant Health PAMS (acs) High Labor and materials

Scenario Description:
PAMS activities with high labor and material costs will be implemented on a large scale crop production area (weather station, netting, field sanitation, mating disruption etc.).

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an ident

After Situation:
Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Acres of Management Appli

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $19,823.34

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $495.58

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 595 - Pest Management Conservation System

Scenario: #261 - Plant health PAMS (Small Farm - each) labor only

Scenario Description:
PAMS activities with labor costs will be implemented on a small scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an ident

After Situation:
Planned Prevention (resistant cultivar selection, pest habitat removal, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Small farm, typically <= 5 ac

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $607.68

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $607.68

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 595 - Pest Management Conservation System

Scenario: #262 - Plant Health PAMS activities (Small Farm - each) labor and materials

Scenario Description:
PAMS activities with labor and material costs will be implemented on a small scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an ident

After Situation:
Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Small Farm, typically <= 5 ac

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,076.31

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,076.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 600 - Terrace

Scenario: #1 - Broad-based

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a broad-based terrace having 5:1 upstream and 5:1 downstream slopes measuring 2,500 feet in a field with slopes from 2% to 8% constructed in loam soils or similar in regards to workability. Channel and berm are farmed. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient tran

After Situation:

A system of broad-based terraces measuring 2,500 feet in length, 2.5 height, and 5:1 front and back slopes is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. The installed terrace is typically farmed. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Foot

Scenario Typical Size: 2,500.0

Scenario Total Cost: $5,943.21

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 600 - Terrace

Scenario: #2 - Flat Channel

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths, and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a flat channel (level) terrace storing runoff with a length of 2,500 feet and side slopes of 8:1 or greater in a field with slopes from 2% to 8% constructed in loam soils or similar in regards to workability. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient tran

After Situation:

A system of flat channel (level) terraces with approximately 8:1 front and back slopes, 2.5 feet height, and 2,500 feet in length is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. The installed terrace is typically farmed. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Foot

Scenario Typical Size: 2,500.0

Scenario Total Cost: $9,317.15

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.73

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 600 - Terrace

Scenario: #3 - Grass Backed (Region)

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a system of terraces (2,500 feet in length) that have one relatively flat (5:1) slope and one steep (2:1) slope constructed in a field with slopes from 2% to 8% installed in loam soils or similar soils in regards to workability. The steep slope is established to permanent vegetation with the flatter slope farmed. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Vegetation of one slope is included. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient tran

After Situation:

A system of terraces with one steep (2:1) and one flat (5:1) slope measuring 2,500 feet in length and 2.5' height is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Grassed Waterway (412) and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Foot

Scenario Typical Size: 2,500.0

Scenario Total Cost: $4,268.19

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.71

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 600 - Terrace

Scenario: #4 - Narrow Base, less than 8% slope (Region)

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a system of narrow base terraces with 2:1 slopes, 2,500' length, and 2.5' height in a field with slopes from 3% to 8% constructed in loam soils or similar in regards to workability. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Permanent vegetation is established. Vegetation is included for both slopes. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient tran

After Situation:

A system of narrow base terraces with approximately 2:1 front and back slopes measuring 2,500 feet in length and 2.5 feet height is constructed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Grassed Waterway (412) and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Foot

Scenario Typical Size: 2,500.0

Scenario Total Cost: $4,978.48

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 600 - Terrace

Scenario: #5 - Narrow Base, greater than 8% slope (Region)

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a system of narrow base terraces with 2:1 slopes, 2,500' length, and 2.5' height in a field with slopes exceeding 8% constructed in loam soils or similar in regards to workability. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Permanent vegetation is established. Vegetation is included. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient tran

After Situation:

A system of narrow base terraces with approximately 2:1 front and back slopes measuring 2,500 feet in length and 2.5' height is constructed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Grassed Waterway (412) and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Foot

Scenario Typical Size: 2,500.0

Scenario Total Cost: $5,315.91

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.13

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 601 - Vegetative Barrier

Scenario: #2 - Seeded Barrier

Scenario Description:
Permanent strips of stiff, dense vegetation established along the general contour of slopes.

Before Situation:
Significant erosion is occurring resulting in substantial transport of sediment across the slope. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.

After Situation:
Implementation Requirements are prepared and implemented for the site according to the Vegetative Barrier (601) standard. A strip or strips of stiff, dense vegetation is established by seeding along the general contour of the slope that effectively settles a significant amount of sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.

Feature Measure: Per 1000 Linear feet of prac

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $348.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.35

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 601 - Vegetative Barrier

Scenario: #3 - Vegetative Planting

Scenario Description:
Permanent strips of stiff, dense vegetation established along the general contour of slopes.

Before Situation:
Significant erosion is occurring resulting in substantial transport of sediment across the slope. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.

After Situation:
Implementation Requirements are prepared and implemented for the site according to the Vegetative Barrier (601) standard. A strip or strips of stiff, dense vegetation such as Vetiver Grass is/are established along the general contour of the slope that effectively settles a significant amount of sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.

Feature Measure: Per 100 foot Linear feet of p

Scenario Unit: Foot

Scenario Typical Size: 100.0

Scenario Total Cost: $914.88

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9.15

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 606 - Subsurface Drain

Scenario: #1 - Corrugated Plastic Pipe (CPP), Single-Wall, <= 6 Inches

Scenario Description:

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a drainage plow. HDPE (CPP) Single-Wall is manufactured in sizes (nominal diameter) from 3-inch to 24-inch; typical practice sizes range from 3-inch to 12-inch; and typical scenario size is 5-inch. Construct 2,000 feet of 5-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. The unit is in weight of pipe material in pounds. 2,000 feet of 5-inch, Single-Wall, perforated HDPE CPP weighs 0.50 lb./ft, or a total of 1,000 pounds. The typical number of mainline connections for 2,000 feet of subsurface drain line is a total of 3 each. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.).

After Situation:

The drainage modifications result in reduced plant stress due to excessive wetness caused by a seasonal high water table, or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Length of Pipe

Scenario Unit: Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $9,373.40

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 606 - Subsurface Drain

Scenario: #2 - Enveloped Corrugated Plastic Pipe (CPP), Single-Wall, <= 6 Inches

Scenario Description:

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline with Sand-Gravel envelope, using a drainage trencher. HDPE (CPP) Single-Wall is manufactured in sizes (nominal diameter) from 3-inch to 24-inch; typical practice sizes range from 3-inch to 12-inch; and typical scenario size is 5-inch. Construct 2,000 feet of 5-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth of 5 feet, and surrounded with a sand-gravel envelope. The unit is in weight of pipe material in pounds. 2,000 feet of 5-inch, Single-Wall, perforated HDPE CPP weighs 0.50 lb./ft, or a total of 1,000 pounds. The typical volume sand-gravel for 2,000 feet of 12"wide x 12" high envelope is 64 cubic yards. The typical number of mainline connections for 2,000 feet of subsurface drain line is a total of 3 each. Resource Concerns: Excess Water (seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.).

After Situation:

The drainage modifications result in reduced plant stress due to excessive wetness caused by a seasonal high water table, or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Length of Pipe

Scenario Unit: Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $13,186.54

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.59

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 606 - Subsurface Drain

Scenario: #3 - Corrugated Plastic Pipe (CPP), Single-Wall, > 6 Inches

Scenario Description:

Description: Below ground installation of HDPE (Corrugated Plastic Pipe) pipeline, using a drainage plow. HDPE (CPP) Single-Wall is manufactured in sizes (nominal diameter) from 3-inch to 24-inch; typical practice sizes range from 3-inch to 12-inch; and typical scenario size is 10-inch. Construct 1,000 feet of 10-inch, Single-Wall, HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. The unit is in weight of pipe material in pounds. 1,000 feet of 10-inch, Single-Wall, HDPE CPP weighs 1.80 lb./ft, or a total of 1,800 pounds. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 607 - Surface Drain, Field Ditch; 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.).

After Situation:

The drainage modifications result in reduced plant stress due to excessive wetness caused by a seasonal high water table, or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Length of Pipe

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $8,842.19

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.84

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 606 - Subsurface Drain

Scenario: #4 - Corrugated Plastic Pipe (CPP), Twin-Wall, > 6 Inches

Scenario Description:

Description: Below ground installation of HDPE (Corrugated Plastic Pipe) pipeline, using a drainage plow. HDPE (CPP) Twin-Wall is manufactured in sizes (nominal diameter) from 4-inch to 60-inch; typical practice sizes range from 8-inch to 15-inch; and typical scenario size is 12-inch. Construct 1,000 feet of 12-inch, Twin-Wall, HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. The unit is in weight of pipe material in pounds. 1,000 feet of 12-inch, Twin-Wall, HDPE CPP weighs 3.20 lb./ft, or a total of 3,200 pounds. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 607 - Surface Drain, Field Ditch; 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.).

After Situation:

The drainage modifications result in reduced plant stress due to excessive wetness caused by a seasonal high water table, or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Length of Pipe

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $19,966.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $19.97

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #1 - Plug Conifers, hand plant

Scenario Description:

Tree seedlings will be hand planted in the forested area where few or no forest trees are growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

Before Situation:

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat

After Situation:

The prescribed number of trees are hand planted on 40 acres, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

Feature Measure: Area Planted

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $10,973.99

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $274.35

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #2 - Bare root conifers, hand plant

Scenario Description:

This practice involves planting of tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a medium density planting rate. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Terrain is moderately to steeply sloping, too steep to be planted with a mechanical tree planter so the area is hand planted.

Before Situation:

The land has a little/no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the lose of the native forest ecosystem (organic matter in top soil depleted). T

After Situation:

40 acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $12,557.43

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $313.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #3 - Bare Root Conifers, machine plant

Scenario Description:

This practice involves planting of tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a medium density planting rate. The resource concerns addressed is degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Terrain is moderately sloping and will be planted with a mechanical tree planter. Smaller size seedlings (1-0) are planted.

Before Situation:

The land has a little or no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the lose of the native forest ecosystem (organic matter in top soil depleted)

After Situation:

40 acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement. Half of planted trees have vexar tubes, or similar, installed to protect from animal damage.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $12,540.61

Total Cost per Unit: $313.52

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #4 - Hand plant bare root hardwoods, no tubes

Scenario Description:

Improving the hardwood forest setting by hand planting hardwood tree seedlings. Seedlings are protected from deer browsing. The number of trees to plant is lower than establishing a new forest. Resource concerns are degraded plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation.

Before Situation:

In an existing upland forest the present trees are poor quality, at low stocking levels, or are undesirable species. Existing conditions do not meet landowner objectives of growing high quality trees. Wildlife habitat is poor due to the above described co

After Situation:

The area of treatment is 10 acres. Bare root hardwood seedlings are planted by hand in the best locations for seedling survival. Post planting vegetation control is planned to ensure seedling survival.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $5,187.76

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $518.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #5 - Bare Root Hardwood, machine plant, no tubes, 300

Scenario Description:

This practice involves planting of tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a medium density planting rate. The resource concerns addressed is degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Terrain is moderately sloping and will be planted with a mechanical tree planter. Smaller size seedlings (1-0) are planted.

Before Situation:

The land has a little or no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the lose of the native forest ecosystem (organic matter in top soil depleted)

After Situation:

10 acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement. Half of planted trees have vexar tubes, or similar, installed to protect from animal damage.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $4,279.60

Total Cost per Unit: $427.96

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #6 - Bare Root Hardwood with Tubes, 150

Scenario Description:

Improving the hardwood forest setting by hand planting hardwood tree seedlings. Seedlings are protected from deer browsing. The number of trees to plant is lower than establishing a new forest. Resource concerns are degraded plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation.

Before Situation:

In an existing upland forest the present trees are poor quality, at low stocking levels, or are undesirable species. Existing conditions do not meet landowner objectives of growing high quality trees. Wildlife habitat is poor due to the above described co

After Situation:

The area of treatment is 10 acres. Bare root hardwood seedlings are planted by hand in the best locations for seedling survival. Solid tree tubes are installed to protect seedlings from animal browsing damage. Post planting vegetation control is planned to ensure seedling survival.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $14,466.38

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,446.64

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #7 - Planting Potted or B&B Hardwoods

Scenario Description:

Hardwood seedlings (potted) to be planted to reestablish an upland hardwood forest. Planting will be by hand. The resource setting is an area that historically was an upland hardwood forest. Resource concerns are degrade plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife.

Before Situation:

The native forest that has been removed and the land is either row cropped, grazed or hayed or brushy forest. If any upland trees exist they are poor quality tree or undesirable species. Terrain is gently to moderately sloping with soil erosion-sheet and

After Situation:

The area of treatment is 10 acres. Potted/containerized hardwood seedlings are planted by hand. Post vegetation control should be evaluated and conducted it necessary.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,811.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,811.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #8 - Planting Bare Root Shrubs, no tubes

Scenario Description:

Shrubs are planted to provide a more diverse habitat on 0.5 acre at 5'x10' spacing. Plantings are in either uplands, riparian zones or bottomlands. The site lacks ground level habitat structure and diversity for wildlife. Resource concern is inadequate habitat for fish and wildlife - habitat fragmentation.

Before Situation:

No shrubbery vegetation, or very little, is present under the forest overstory. Wildlife species that need shrub cover are not present. An adequate stand of overstory trees is present, but it is a single level, not multi-level.

After Situation:

A 0.5 acre area is planted with shrubs on a 5'x10' spacing. Wildlife habitat fragmentation is reduced. Wildlife food and cover resources are improved.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 0.5

Scenario Total Cost: $1,293.10

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,586.19

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #9 - Plant Containerized Stock (per plant), conifer

Scenario Description:

Tree seedlings will be hand planted in the forested area where few or no forest trees are growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

Before Situation:

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat

After Situation:

The prescribed number of trees are hand planted on 20 acres, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

Feature Measure: Area Planted

Scenario Unit: Each

Scenario Typical Size: 6,000.0

Scenario Total Cost: $6,715.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #10 - Hand Plant Containerized with Protection from Wildlife (per plant), w tubes

Scenario Description:

Tree seedlings will be hand planted in the forested area where few or no forest trees growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Seedlings are protected from wildlife browsing. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

Before Situation:

The stocking level does not meet the minimum recommended number of trees per acre and does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor. Wildlife are known to browse tree seed

After Situation:

The prescribed number of trees are hand planted, and the objectives of the landowner are met. Seedlings are protected from wildlife browsing by installing some type of protection devise. A forest will provide wildlife habitat, provide a long term ground and capture atmospheric carbon.

Feature Measure: Each Planted Seedling

Scenario Unit: Each

Scenario Typical Size: 6,000.0

Scenario Total Cost: $33,548.39

Total Cost per Unit: $5.59

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #11 - Hardwood in tube or cage, Conifer in cage (per plant)

Scenario Description:

Tree seedlings will be hand planted with a post hole digger, shovel or mattock in poorly stocked forested areas where few or no forest trees growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Certain wildlife attributes such as hard or soft mast may be lacking. The number of trees planted per acre is variable because existing stocking varies. In many instances, planting areas are sloping, rocky and have competing roots from existing trees present which makes planting more time consuming and a planting dibble will not work. Seedlings are protected from wildlife browsing (i.e.. 5' shelter). Supervisor instructs tree planter how to plant the tree and erect the shelter on first day and checks work for quality as planting proceeds. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat. Typically 50 trees are planted per acre.

Before Situation:

The stocking level does not meet the minimum recommended number of trees per acre and does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor. Wildlife are known to browse tree seed

After Situation:

The prescribed number of trees are hand planted, and the objectives of the landowner are met. Seedlings are protected from wildlife browsing by installing some type of protection devise (i.e. 5 ' shelter). A forest will provide wildlife habitat, provide a long term ground and capture atmospheric carbon.

Feature Measure: number of trees and shelter

Scenario Unit: Each

Scenario Typical Size: 50.0

Scenario Total Cost: $1,159.10

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $23.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #12 - Hardwood Hand Plant, no Tube or Cage (per plant)

Scenario Description:

Tree seedlings will be hand planted in the forested area where few or no forest trees growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

Before Situation:

The stocking level does not meet the minimum recommended number of trees per acre and does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor. Wildlife are known to browse tree seed

After Situation:

The prescribed number of trees are hand planted, and the objectives of the landowner are met. A forest will provide wildlife habitat, provide a long term ground and capture atmospheric carbon.

Feature Measure: number of trees installed

Scenario Unit: Each

Scenario Typical Size: 100.0

Scenario Total Cost: $805.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #14 - Potted, each, tube

Scenario Description:
Planting of containerized hardwood seedlings from 3-5 gal pots in small (0-10 ac) settings where advanced growth is necessary to ensure survival w/competing vegetation. Density of containerized seedlings is 200/acre.

Before Situation:
Open or cut over area covered by grasses, weeds or insufficient or inappropriate woody reproduction. This practice is used to replace and/or augment plants that are suited to the site based on landowner objectives. Resource Concern is Degraded Plant Condi

After Situation:
General laborers plant containerized hardwood seedlings with a post hole digger or tractor auger. Seedlings are protected from animal browsing with 4' tree shelter. Plants on the site are adapted and suited to landowner objectives after tree planting.

Feature Measure: number of trees installed

Scenario Unit: Each

Scenario Typical Size: 200.0

Scenario Total Cost: $5,566.80

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $27.83

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #15 - BRHdwds, machine plant, dense, no tube

Scenario Description:

This practice involves planting tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a medium density planting rate (680 trees/acre). The resource concerns addressed are degraded plant condition - undesirable plant productivity and health and inadequate structure composition and degraded wildlife habitat. Terrain is moderately sloping and will be planted with a machine tree planter. Smaller size seedlings (1-0) are planted.

Before Situation:

The land has little or no tree cover or is stocked with the wrong tree species. Competing vegetation before and after planting is a concern. Native wildlife habitat is lacking.

After Situation:

10 acres of land is established with permanent tree cover that will improve degraded plant condition and establish wildlife habitat, sequester carbon, and reduce invasive species presence. Establishment of forest vegetation also created corridors for wildlife movement.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $8,368.15

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $836.82

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #16 - BRHdwds w tubes, 110 per acre

Scenario Description:

This practice involves planting tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a low density planting rate (110 trees/acre). The resource concerns addressed are degraded plant condition - undesirable plant productivity and health and inadequate structure composition and degraded wildlife habitat. Terrain is moderately sloping and will be planted with a machine tree planter. Smaller size seedlings (1-0) are planted.

Before Situation:

The land has little or no tree cover or is stocked with the wrong tree species. Competing vegetation before and after planting is a concern. Native wildlife habitat is lacking.

After Situation:

10 acres of land is established with permanent tree cover that will improve degraded plant condition and establish wildlife habitat, sequester carbon, and reduce invasive species presence. Establishment of forest vegetation also created corridors for wildlife movement.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $11,217.15

Total Cost per Unit: $1,121.72

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #17 - BRHdwds w tubes, 300 per acre

Scenario Description:

This practice involves planting tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a low-medium density planting rate (300 trees/acre). The resource concerns addressed are degraded plant condition - undesirable plant productivity and health and inadequate structure composition and degraded wildlife habitat. Terrain is moderately sloping and will be planted with a machine tree planter. Smaller size seedlings (1-0) are planted.

Before Situation:

The land has little or no tree cover or is stocked with the wrong tree species. Competing vegetation before and after planting is a concern. Native wildlife habitat is lacking.

After Situation:

10 acres of land is established with permanent tree cover that will improve degraded plant condition and establish wildlife habitat, sequester carbon, and reduce invasive species presence. Establishment of forest vegetation also created corridors for wildlife movement.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $30,738.76

Total Cost per Unit: $3,073.88

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #51 - Tree/shrub Planted Area with Protection

Scenario Description:

Tree seedlings will be hand planted in a forested area where few or no forest trees are currently growing. When implemented with the guidance of a professional forester, a well-stocked stand of a predetermined species composition will result. Standard forestry measures are used to provide temporary protection for planted trees, to improve the likelihood of successful establishment and achieve landowner objectives for future forest stand composition. Seedlings are protected by temporary 8' high fencing materials or poly netting, designed to be moved when regeneration is established. Resource concerns include: Degraded Plant Condition - Inadequate structure and composition, Undesirable plant productivity and health, and/or Inadequate wildlife & fish habitat; and/or Water Quality Degradation - Excessive sediment in surface waters.

Before Situation:

Forest stands lack the desired species composition and/or structure, and/or have been impacted by environmental stressors and are unhealthy. Wildlife habitat is inadequate. Forest conditions do not meet landowner objectives. Environmental conditions are l

After Situation:

Trees have been successfully established on 20 acres of forest land. The regrowing forest exhibits the planned mix of diverse native tree species. The future forest will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, and sequester carbon.

Feature Measure: area

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $20,341.11

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,017.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #52 - Tree/Shrub Regeneration Area with Protection

Scenario Description:

Naturally regenerate a forest stand using properly timed even-aged overstory harvesting methods and necessary site preparation. When implemented with the guidance of a professional forester, such silvicultural activities result in well stocked stands representative of the natural community. Standard forestry measures are used to provide temporary protection for regenerating trees, to improve the likelihood of successful regeneration and achieve landowner objectives for future forest stand composition. Seedlings are protected by temporary 8' high fencing materials or poly netting, designed to be moved when regeneration is established. Clearing of brush and undesirable trees is not necessary. Resource concerns include: Degraded Plant Condition - Inadequate structure and composition, Undesirable plant productivity and health, and/or Inadequate wildlife & fish habitat; and/or Water Quality Degradation - Excessive sediment in surface waters.

Before Situation:

Forest stands lack the desired species composition and/or structure, and/or have been impacted by environmental stressors and are unhealthy. Wildlife habitat is inadequate. Forest conditions do not meet landowner objectives. Environmental conditions are l

After Situation:

Natural forest regeneration has been accomplished on 20 acres of forest land. Trees are successfully established and the forest exhibits the planned mix of diverse native tree species. The future forest will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, and sequester carbon.

Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $10,634.72

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $531.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 612 - Tree/Shrub Establishment

Scenario: #105 - Tree-Shrub Establishment - Small Acreage 5 acres or less

Scenario Description:

Seedling (potted) to be planted for conservation purposes other than reforestation. Planting will be by hand. The resource setting is an area that historically was an upland forest. Resource concerns are degraded plant condition - undesirable productivity and health, and inadequate structure and composition; inadequate habitat for fish and wildlife.

Before Situation:

The native forest has been removed and the land is either row cropped, farmstead, or associated agricultural land. If any upland trees exist, they are poor quality or undesirable species. Terrain is gently to moderately sloping with soil erosion-sheet and

After Situation:

Typical treatment area can range from less than 1 acre to 5 acres; typical scenario based on 1 ac, 150 TPA. Potted/containerized hardwood seedlings are planted by hand. Post vegetation control should be evaluated and conducted, if necessary.

Feature Measure: Planted Seedling

Scenario Unit: Each

Scenario Typical Size: 150.0

Scenario Total Cost: $4,123.20

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $27.49

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 614 - Watering Facility

Scenario: #1 - Converted heavy equipment tire trough

Scenario Description:

An 8 ft. diameter heavy equipment tire trough (HETT) is installed to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The HETT is placed on a concrete pad that extends 1.0' beyond the trough on all sides. The concrete pad is underlain by gravel and geotextile. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and or wildlife.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk

After Situation:

The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment (Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (Code 561).

Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,880.25

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,880.25

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 614 - Watering Facility

Scenario: #2 - 2-hole freeze-proof watering trough

Scenario Description:

A permanent, 2-hole freeze-proof watering trough is installed per manufacturer's requirements to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a concrete pad that extends 1.5’ beyond the trough on all sides (5’x7’x5”). The concrete pad is underlain by 4” of gravel and geotextile. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk e

After Situation:

The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (516). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Water Harvesting Catchment ((636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (561).

Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,420.95

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,420.95

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 614 - Watering Facility

Scenario: #3 - 4-hole freeze-proof watering trough

Scenario Description:

A permanent, 4-hole freeze-proof watering trough is installed per manufacturer's requirements to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a concrete pad that extends 1.5' beyond the trough on all sides (7'x7'x5"). The concrete pad is underlain by 4" of gravel and geotextile. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk e

After Situation:

The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (516). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Water Harvesting Catchment ((636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (561).

Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,959.68

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,959.68

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 614 - Watering Facility

Scenario: #4 - Tank, 100 to 500 gallons

Scenario Description:

A 300-gallon polyethylene watering trough (5’ diameter) is installed to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a concrete pad that extends 1.0’ beyond the trough on all sides (7’x7’x5”). The concrete pad is underlain by 4” of gravel and geotextile. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk e

After Situation:

The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (516). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Water Harvesting Catchment ((636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (561).

Feature Measure: Each watering facility

Scenario Unit: Gallon

Scenario Typical Size: 300.0

Scenario Total Cost: $2,097.75

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 614 - Watering Facility

Scenario: #5 - Tank, 500 to 1000 gallons

Scenario Description:

A 500-gallon (6 ft. diameter) concrete tank watering trough is installed to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a 5”-thick concrete pad that extends 1.0’ beyond the trough on all sides. The concrete pad is underlain by gravel (4”) and geotextile. The practice includes vegetation of all areas disturbed by construction. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk

After Situation:

The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment ((Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (Code 561).

Feature Measure: Each watering facility

Scenario Unit: Gallon

Scenario Typical Size: 500.0

Scenario Total Cost: $2,899.48

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.80

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 614 - Watering Facility

Scenario: #6 - Tank, 1000 to 1500 gallons

Scenario Description:

A 1,000-1,500 gallon steel tank (10' dia.) with bottom liner watering trough is installed to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The trough is placed on a 5”-thick concrete pad that extends 1.0’ beyond the trough on all sides. The concrete pad is underlain by gravel (4”) and geotextile. Vegetation of disturbed areas is included in practice installation. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concern of inadequate supply of water for livestock and/or wildlife.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk

After Situation:

The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment (Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (Code 561).

Feature Measure: Each watering facility

Scenario Unit: Gallon

Scenario Typical Size: 1,200.0

Scenario Total Cost: $3,125.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.60

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 614 - Watering Facility

Scenario: #7 - Tank, greater than 1500 gallons

Scenario Description:

A >1,500 gallon steel with bottom liner watering trough constructed of approved materials, installed to provide water for livestock on a 14' x 14' x5" concrete foundation. Geotextile and gravel are installed under the concrete pad to protect access from livestock hooves that could cause erosion All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed and livestock must walk e

After Situation:

The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment (Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (Code 561).

Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,517.36

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,517.36

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 614 - Watering Facility

Scenario: #8 - Portable Trough, less than 100 gallons

Scenario Description:

This scenario is used for a pasture rotation, Prescribed Grazing (528), or enhanced pasture management utilization, by installing a small water trough (100 gallon) for water supply. The trough is moved from paddock to paddock as outlined in the plan. Because the system does not flow continuously a float is needed to maintain the water level within the portable trough. A typical system will have six paddocks using a single trough.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livestock must walk

After Situation:

A portable heavy duty polyethylene trough is installed as part of an intensive rotational grazing management system. The trough is connected to a water supply system via quick coupler. The trough is secured to wooden posts next to the hydrant and protected by wooden boards attached to the posts. The watering facility is installed to provide water at a controlled access point to meet the livestock needs, improve animal and waste distribution/nutrient cycling, or provide a water source that is an alternative to a sensitive resource. All supply pipeline is installed using Livestock Pipeline (Code 516). Any needed water source installation will use Water Well (Code 642), Pumping Plant (Code 533), Spring Development (Code 574), or Water Harvesting Catchment (Code 636), as appropriate. A backflow prevention device will be installed on a watering facility that is connected to a well or to a domestic or municipal water supply. The area around the watering facility will be protected by using Heavy Use Area Protection (561). Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (Code 561) as appropriate.

Feature Measure: Number of Portable Trough

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $257.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $257.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 614 - Watering Facility

Scenario: #9 - Water Ramp, Rock on Geotextile (Region)

Scenario Description:

A permanent watering ramp is installed in a stream or pond to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The ramp will be constructed of rock and/or gravel over a geotextile fabric. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The cost includes all materials, equipment, and labor to install the surfacing material. It also includes needed vegetation of disturbed areas. The watering facility will address the resource concern of inadequate water for livestock and/or wildlife. Access to water will be restricted to the area of the ramp.

Before Situation:

Livestock have uncontrolled access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livesto

After Situation:

A permanent watering facility-water ramp is constructed of 640 square feet of rock and/or gravel surfacing on 84 square yards of geotextile fabric foundation. (The geotextile quantity includes the necessary overlap of material.) Livestock access to the water source will be limited by fencing. All fencing will use Fence (Code 382).

Feature Measure: Area of Ramp

Scenario Unit: Square Foot

Scenario Typical Size: 640.0

Scenario Total Cost: $1,543.90

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 614 - Watering Facility

Scenario: #10 - Water Ramp, Rock in GeoCell on Geotextile (Region)

Scenario Description:

A permanent watering ramp is installed in a stream or pond to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The ramp will be constructed of rock and/or gravel over a geotextile fabric. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The cost includes all materials, equipment, and labor to install the surfacing material. It also includes needed vegetation of disturbed areas. The watering facility will address the resource concern of inadequate water for livestock and/or wildlife. Access to water will be restricted to the area of the ramp.

Before Situation:

Livestock have uncontrolled access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livesto

After Situation:

A permanent watering facility-water ramp is constructed of 640 square feet of rock and/or gravel surfacing spread 6 inches deep over 72 square yards of 4 inch cellular containment grid on 84 square yards of geotextile fabric foundation (The geotextile quantity includes the necessary overlap of material.) Livestock access to the water source will be limited by fencing. All fencing will use Fence (Code 382).

Feature Measure: Area of Ramp

Scenario Unit: Square Foot

Scenario Typical Size: 640.0

Scenario Total Cost: $3,210.59

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 614 - Watering Facility

Scenario: #11 - Water Ramp, Rock Riprap and gravel on Geotextile

Scenario Description:

A permanent watering ramp is installed in a stream or pond to provide drinking water for livestock, improve animal distribution, or provide a water source that is an alternative to a sensitive resource. The ramp will be constructed of rock riprap and gravel over a geotextile fabric. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The cost includes all materials, equipment, and labor to install the surfacing material. It also includes needed vegetation of disturbed areas. The watering facility will address the resource concern of inadequate water for livestock and/or wildlife. Access to water will be restricted to the area of the ramp.

Before Situation:

Livestock have uncontrolled access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering non-point source pollutants directly to the receiving water, grazing patterns of the livestock are poorly distributed, and livesto

After Situation:

A permanent watering ramp is constructed of 640 square feet of rock riprap (8 inches deep) and gravel surfacing (2 inches deep) on 84 square yards of geotextile fabric foundation. (The geotextile quantity includes the necessary overlap of material.) Livestock access to the water source will be limited by fencing. All fencing will use Fence (Code 382).

Feature Measure: Area of Ramp

Scenario Unit: Square Foot

Scenario Typical Size: 640.0

Scenario Total Cost: $7,723.82

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12.07

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 614 - Watering Facility

Scenario: #18 - Underground storage reservoir

Scenario Description:

A 1,700 gallon plastic storage tank (6'x12'x6' high) is installed underground to provide water to be gravity fed to down-slope watering troughs and/or tanks for livestock. Site excavated in rocky soil to install storage tank on a 6'x12'x6" gravel pad foundation. Gravel installed on top of a non-woven geotextile to provide a stable base for the tank and also on the ground adjacent to the overflow to prevent erosion; gravel also installed on the sides and ends of the tank up to the top. Approximately 18" of topsoil placed on top to protect the tank and prevent freezing. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, improve grazing distribution and plant and livestock productivity and health.

Before Situation:

Livestock have access to streams, ponds and/or lakes causing shoreline and/or streambank erosion and delivering pollutants directly to the receiving water; grazing patterns of the livestock are poorly distributed and livestock must walk excessive distance

After Situation:

A plastic storage tank is installed to provide water for livestock via down-slope watering troughs and/or tanks. The down-slope watering facilities improve animal grazing distribution and nutrient cycling. The underground storage tank is installed on a 6'x12'x 6" gravel bed that sits on top of a non-woven geotextile. Associated practices: 516 Livestock Pipeline (buried pipe for getting water to and out of the 614 storage tank; and also freeze-proof hydrants); and 614 scenarios for watering facilities where livestock access/drink; 561 HUAP; 620 Underground Outlet (to safely discharge overflow water); any needed water source installation will use Water Well (642), Pumping Plant (533), or Spring Development (574) as appropriate.

Feature Measure: Each watering facility

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $5,490.60

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,490.60

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 620 - Underground Outlet

Scenario: #1 - Pipe, no inlet, 6 inch or less

Scenario Description:

Install 280 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 44" deep and 24" wide. Costs include 6" HDPE pipe, trench excavation, trench backfill, 20' of 6" PVC outlet pipe with rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with roof runoff management or similar practices.

Before Situation:

Roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Clean storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Diversion (342), Roof Runoff Management (558) and Subsurface Drainage (606)

Feature Measure: Length of Conduit, including

Scenario Unit: Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $2,973.45

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9.91

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 620 - Underground Outlet

Scenario: #2 - Pipe, no inlet, greater than 6 inches and 12 inches or less

Scenario Description:

Install 280 feet of 12" approved plastic pipe to convey storm-water from one location to a suitable and stable outlet. Trench Excavation is 44" deep and 24" wide. Costs include 12" HDPE pipe, trench excavation, trench backfill, 20' of 12" PVC outlet pipe with rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with roof runoff management or similar practices.

Before Situation:

Roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Clean storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Diversion (342), Roof Runoff Management (558) and Subsurface Drainage (606)

Feature Measure: Length of Conduit, including

Scenario Unit: Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $4,596.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $15.32

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 620 - Underground Outlet

Scenario: #3 - Pipe, no inlet, greater than 12 inch

Scenario Description:

Install 300 feet of 18" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 44" deep and 24" wide. Costs include 18" HDPE pipe, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet (outlet pipe not separate since component is double wall pipe). This practice is often installed in conjunction with roof runoff management or similar practices.

Before Situation:

Roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Clean storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Diversion (342), Roof Runoff Management (558) and Subsurface Drainage (606)

Feature Measure: Length of Conduit, including

Scenario Unit: Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $8,547.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $28.49

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 620 - Underground Outlet

Scenario: #4 - Pipe, riser, 6 inch or less

Scenario Description:

Install 480 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated approximately 54" deep and 15" wide by hydraulic excavator. Costs include 6" SDR35 plastic pipe, 8" Perforated PVC Riser Inlet, trench excavation, trench backfill, 20' of 6" PVC outlet pipe with rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contribu

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit, including

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $7,968.65

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $15.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 620 - Underground Outlet

Scenario: #5 - Pipe, riser, > 6 inches and <= 12 inches

Scenario Description:

Install 480 feet of 8" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 8" SDR35 plastic pipe, 10" Perforated PVC Riser Inlet, trench excavation, trench backfill, 20' of 8" PVC outlet pipe with rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contribu

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit, including

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $13,408.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $26.82

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 620 - Underground Outlet

Scenario: #6 - Pipe, riser, greater than 12 inch

Scenario Description:

Install 500 feet of 18" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 64" deep and 32" wide. Costs include 18" HDPE pipe, an additional 6' of 18" HDPE to serve as a Riser Inlet, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contribu

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit, including

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $15,189.25

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $30.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 620 - Underground Outlet

Scenario: #7 - Pipe, drop inlet, 6 inch or less

Scenario Description:

Install 500 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated 54" deep and 24" wide by hydraulic track excavator. Costs include 6" Sch 40 PVC pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contribu

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $8,702.69

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $17.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 620 - Underground Outlet

Scenario: #8 - Pipe, drop inlet, > 6 inches and <= 12 inches

Scenario Description:

Install 500 feet of 12" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 12" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contribu

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $10,252.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $20.51

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 620 - Underground Outlet

Scenario: #9 - Pipe, drop inlet, 18 inch or less

Scenario Description:

Install 500 feet of 18" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 66" deep x 39" wide. Costs include 18" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often is installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contribu

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $17,494.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $34.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 620 - Underground Outlet

Scenario: #10 - Pipe, drop inlet, 24 inch or less

Scenario Description:

Install 500 feet of 24" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 72" x 48" wide. Costs include 24" HDPE pipe, Precast concrete drop inlet with steel grate, 24" HDPE pipe, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. Practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contribu

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $26,605.96

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $53.21

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 620 - Underground Outlet

Scenario: #11 - Pipe, drop inlet, 30 inch or less

Scenario Description:

Install 500 feet of 30" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 78" deep x 56" wide. Costs include 30" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practices is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contribu

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $35,867.31

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $71.73

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 620 - Underground Outlet

Scenario: #12 - Pipe, drop inlet, greater than 30 inch

Scenario Description:

Install 500 feet of 36" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 84" deep x 64" wide. Costs include 36" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contribu

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $44,946.15

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $89.89

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 629 - Waste Treatment

Scenario: #1 - Litter Windrow Pasteurization

Scenario Description:

This practice scenario includes the in house windrowing of poultry litter to promote pasteurization between flocks. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient and pathogens) and air quality impacts (PM & PM precursors, and objectionable odors). Associated practices: Amendments for Treatment of Agricultural Waste (591), Waste Storage Facility (313), & Nutrient Management (590)

Before Situation:

A poultry operation typically removes part of the litter and bedding between flocks, called a cakeout. A full cleanout of litter and bedding is typically done once every 1-3 years depending on the operation. Over time, the accumulation of poultry waste in

After Situation:

This scenario assumes 4 flocks per year in an operation with 2 - 42 x 500 square foot houses. Three (3) in-house pasteurization events will be performed annually. There will be a full cleanout after the 4th flock. Formula to calculate the total number of pasteurization events per year on a 1000 SF basis: (Square Feet of house) / 1000 SF X (Number of houses) X (Number of pasteurization events) = Number of 1000SF. 21,000 SF / 1000 SF X 2 houses X 3 events = 126 units of 1000SF In house pasteurization of poultry litter is achieved by windrowing the litter in the house. The process takes approximately one week. This process successfully addresses the air quality impacts (ammonia emissions, PM and PM precursors) and bird health resource concerns. This process also improves the quality of poultry litter that must be spread on farmland. Bird health is improved and bird mortality is reduced.

Feature Measure: Surface Area of housing floo

Scenario Unit: 1,000 Square Feet

Scenario Typical Size: 126.0

Scenario Total Cost: $7,716.41

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $61.24

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 629 - Waste Treatment

Scenario: #65 - Animal Mortality Preprocessor

Scenario Description:

This scenario provides for preprocessing of animal mortalities with compost in order to reduce the size of carcass being composted, allow fluids to be mixed into the compost, which will facilitate faster composting (more carcass throughput in an existing facility), a reduction in the need for carbonaceous material, a reduction in odor and associated vectors such as flies, reduction in GHG produced, and facilitate other benefits of composting animal carcasses. The scenario uses a commercially manufactured animal carcass preprocessor with a large tub hopper which facilitates grinding of the carcass with compost in an approximate 20-minute cycle time resulting in absorption of fluids by the carbonaceous material that is preprocessed with the carcass in the tub/hopper. The carcass preprocessor should be installed with features to enable loading and unloading of the material to be processed, all electrical appurtenances needed, and with training of the operator on proper operation of the machinery. Sizing of the facility is based on the typical animal carcass size and the number of animals at the facility. The carcass preprocessor and any associated equipment will need to be placed under roof and on a concrete slab. These items are not included in this scenario and if needed would require the addition of associated practices Heavy Use Area Protection (561) and Roofs and Cover (367). Other associated practices are Critical Area Planting (342), Nutrient Management (590), Animal Mortality Facility (316), and Subsurface Drain (606). This typical scenario would cover a facility with either 24,000 to 55,000 nursery pigs, up to 20,000 finishing swine, up to 3500 sows, 140,000 to 225,000 poultry broilers, 200,000 to 400,000 layers which would require a 20 HP Preprocessing Unit.

Before Situation:

An existing animal mortality facility is under sized, has excessive odor or fly issues, has mortality associated leachate issues, or is experiencing poor composting results which could indicate higher than desired GHG production. Large unit sizes of anima

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics and pathogens being transported into surface and groundwater resources. A preprocessor machine is installed on a concrete pad adjacent to composting areas. Mortality is being processed into small, consistently sized particles. The compost required less volume of carbon source. The carbon to nitrogen contact zones are significantly increased following preprocessing, facilitating more efficient composting, less potent GHG production (methane and N20) and storage properties of all waste materials are reduced and enhanced. Animal mortality composting is being done with less required volume of carbonaceous material, no leachate, no odor or flies, and the composting rate has been improved which increases the mortality throughput for the existing facility and with an associated reduction in GHG production.

Feature Measure: Unit Horsepower

Scenario Unit: Horsepower

Scenario Typical Size: 20.0

Scenario Total Cost: $62,381.68

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,119.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 632 - Waste Separation Facility

Scenario: #1 - Mechanical Separation Facility

Scenario Description:

A small mechanical separation facility to partition solids, liquids, and/or associated nutrients from animal waste streams. The partitioning of the previously mentioned components facilitates the protection of air and water quality, protects animal health, and improves the management of an animal waste management system. Mechanical separators may include, but are not limited to: static inclined screens , vibratory screens, rotating screens, centrifuges, screw or roller presses, or other systems. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Amendments for the Treatment of Agricultural Waste (591), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One small mechanical separation facility (a vibratory or rotating screen) installed at livestock facility before storage or treatment or after treatment, for example, after an anaerobic digester. Part of an animal waste management system.

Feature Measure: Item

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $69,201.40

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $69,201.40

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 632 - Waste Separation Facility

Scenario: #2 - Earthen Settling Structure

Scenario Description:

An earthen structure, such as a basin or a terrace or dike like structure, used to capture and separate a portion of the solids from a liquid stream from a feedlot or confinement facility. A concrete pad should be installed on the bottom of the basin and around outlet structures to facilitate cleanout. Removes a portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One earthen settling basin structure (60 ft top width by 200 ft top length by 3 ft deep with 2.5:1 side slopes, with three screening outlet structures) constructed around or at a livestock feeding operation. Removes a portion of the solids that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

Feature Measure: Cubic Foot of Design Storag

Scenario Unit: Cubic Foot

Scenario Typical Size: 30,000.0

Scenario Total Cost: $17,838.05

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.59

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 632 - Waste Separation Facility

Scenario: #3 - Concrete Basin

Scenario Description:

A concrete structure, such as a basin with concrete walls and floor, used to capture and separate a portion of the solids from a liquid stream from a feedlot or confinement facility. Removes as portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One concrete settling basin structure (20 ft wide by 30 ft long with 3 ft high walls and weeping wall/picket structure or outlet control) constructed around or at a livestock feeding operation. Removes a portion of the solids that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

Feature Measure: Cubic Foot of Design Storag

Scenario Unit: Cubic Foot

Scenario Typical Size: 1,800.0

Scenario Total Cost: $23,470.80

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13.04

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 632 - Waste Separation Facility

Scenario: #4 - Concrete Basin, Multiple Cells, Gravity

Scenario Description:

A concrete basin containing multiple cells with concrete walls and floor. Basin cells use gravity and time to separate a portion of the solids from a liquid waste stream from a dry lot dairy, animal production or confinement facility. Often used where manure is cleaned by flushing. Use of multiple separation cells allows for the continuous operation and management of the waste stream to be altered between cells thereby providing time for the solids portion to drain to be handled as a solid, according to the nutrient management plan. Removes a portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations and locations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One concrete gravity settling basin containing multiple cells. The multi cell basin structure is 70 feet wide by 80 ft long and 6 ft deep with an additional 10:1 entrance ramp. There are three cells to the basin with a clean out ramp the width of the structure on just one end. The center cell, used to drain the liquid portion, has 6 ft reinforced concrete "T" walls with weeping wall structures. The center cell design volume is considered no more than half full to maintain drainage of the facility. The two outside cells collecting the separated solids (25 ft x 80 ft x 6 ft plus ramp storage) have outside walls that are designed to store the solid settled portion of the waste. The waste stream enters the basin at either of the outside cells via a waste transfer component, the liquid portion of the waste flows into the center cell where it is then pumped to a waste storage facility. The pump and long-term liquid and solid waste storage facilities are contracted separately. Basin removes a portion of the solids that otherwise make handling the waste stream solids content difficult to manage over time. Part of an animal waste and nutrient management system.

Feature Measure: Cubic Foot of Design Storag

Scenario Unit: Cubic Foot

Scenario Typical Size: 26,250.0

Scenario Total Cost: $165,059.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.29

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 632 - Waste Separation Facility

Scenario: #5 - Concrete Sand Settling Lane

Scenario Description:

A concrete structure, a concrete lane with curbs, used to capture and separate a portion of the solids, mainly sand, from a liquid stream from a confinement facility. Removes as portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One concrete settling lane structure (25 ft wide by 200 ft long by 0.5 ft thick) constructed around or at a livestock feeding operation. Removes a portion of the solids (sand) that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

Feature Measure: Square Foot of Settling Lane

Scenario Unit: Square Foot

Scenario Typical Size: 5,000.0

Scenario Total Cost: $63,415.20

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12.68

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #1 - Wastewater catch basin, less than or equal to 1000 gal.

Scenario Description:

Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume less than 1000 gallons such as silage leachate, lot runoff and other contaminated liquid effluent. This may include curbs, screens, precast manholes, sumps or catch basins. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow conduit. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The liquids contain few solids or limited solids that can be easily screened out without blocking the collection intake.

After Situation:

This practice scenario is suitable where the estimated design volume for wastewater transfer is less than 1000 gallons of contaminated liquid that may flow from silage bunkers or animal lot areas after a precipitation event. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and/or gutters to collect liquids. With the installation of a precast manhole with lid or catch basin with grate. The cost includes excavation, placement of bedding as needed, placement of structure and backfill with construction of concrete inlet collection area. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallon

Scenario Typical Size: 1,000.0

Scenario Total Cost: $12,356.69

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12.36

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #2 - Wastewater reception pit, 1000 to 5000 gal.

Scenario Description:

Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume between 1000 and 5000 gallons such as silage leachate, lot runoff and other contaminated liquid effluent. This scenario includes a reinforced concrete manure reception pit for temporary storage and transfer of manure and wastewater for an animal operation. Reception Pit includes safety fence w/gate or solid/grated cover. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow conduit. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources.

After Situation:

This practice scenario is suitable where the estimated design volume for waste collection and transfer is between 1000 and 5000 gallons of liquid waste. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters to collect liquid slurry waste and the installation of an 8'x12'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallon

Scenario Typical Size: 4,300.0

Scenario Total Cost: $21,469.15

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #3 - Wastewater basin, 5000 gal. and larger

Scenario Description:

Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume greater than 5000 gallons such as lot runoff, manure slurry and other contaminated liquid effluent. The wastewater collected in this pit is intended to be transferred to final storage within a 48 hour period. This scenario includes a reinforced concrete manure reception pit for temporary storage and transfer of manure and wastewater for an animal operation. Reception Pit includes safety fence w/gate or solid/grated cover. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow conduit. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources.

After Situation:

This practice scenario is suitable where the estimated maximum design volume for wastewater collected is greater than 5000 gallons of liquid waste within 48 hours or before it is stored or treated. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters inlet area to collect liquid slurry waste and the installation of an 12 ft wide x 16 ft long x 6 ft deep reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallon

Scenario Typical Size: 8,600.0

Scenario Total Cost: $32,231.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.75

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #4 - Medium sized wastewater reception pit with 6 inch conduit transfer pipe to waste storage pond

Scenario Description:

Installation for a wastewater collection system that includes materials and structures to collect a design volume between 1000 and 5000 gallons of liquids such as silage leachate, lot runoff and other contaminated liquid effluent which is then transferred through a 6" low pressure conduit to the waste storage structure. This scenario includes a reinforced concrete manure reception pit and a 6" PVC SDR 41 conduit to transfer the manure and wastewater to a waste storage pond. Reception Pit includes safety fence w/gate or solid/grated cover. The transfer conduit consists of the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and equipment for installation. If pumping is required for the pipe flow velocity that needs to be contracted under PS 533, Pumping Plant Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility is required for the CNMP.

After Situation:

This practice scenario is for the estimated design volume for waste collection and transfer of 4300 gallons of liquid waste and can be transferred under gravity or low pressure flow in a 6" PVC pipeline to a waste storage pond. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters at the basin to collect liquid slurry waste and the installation of an 8'x12'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The transfer pipeline is assumed to be 300 feet long, 6" PVC gasketed SDR 41 pipe with an adapter for the concrete basin, couplers, air-vac vents, all other fittings placed as specified by the design, trench excavation, pipe bedding and backfill. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallon

Scenario Typical Size: 4,300.0

Scenario Total Cost: $26,871.34

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.25

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #5 - Large reception pit, 8 inch pipe to treatment, plus 6 inch pipe to storage.

Scenario Description:

Installation for a wastewater collection system that includes materials and structures to collect liquids such as lot runoff, manure slurry and other contaminated liquid effluent. The wastewater collected in this 8600 gallon pit is intended to be transferred to final storage within a 48 hour period. The waste is transferred through an 8" conduit to a waste treatment location. After treatment the remaining liquids are transferred to the waste storage pond in a 6" pipeline. This scenario includes a reinforced concrete manure reception pit an 8" conduit to transfer the manure and wastewater to a treatment location and a secondary 6" transfer pipeline. Reception Pit includes safety fence w/gate or solid/grated cover. The 8" transfer conduit and 6" transfer pipeline consists of the pipe plus the inlet structures connections and all other fittings, trench excavation and backfill, labor and equipment for installation. If pumping is required for the pipe flow velocity that needs to be contracted under PS 533, Pumping Plant Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility is required for the CNMP. Additional waste treatment is required for the

After Situation:

This practice scenario is suitable where the estimated design volume for waste collection and transfer is greater than 5000 gallons of liquid waste and can be transferred under gravity or low pressure flow in an 8" conduit to a waste treatment site. Then the remaining liquids will be transferred in a 6" pipeline to a waste storage pond. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters to collect liquid slurry waste and the installation of an 8'x12'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The first stage transfer pipeline is assumed to be 200 feet long, 8" PVC gasketed SDR 41 pipe with an adapter for the concrete basin, couplers, air-vac vents, all other fittings placed as specified by the design. The second stage transfer pipe is assumed to be 500 feet long 6" PVC gasketed SDR 41 pipe with an adapter for the wastewater treatment system, couplers, air-vac vents, all other fittings placed as specified by the design.. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation costs for trench excavation, pipe bedding and backfill. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallon

Scenario Typical Size: 8,600.0

Scenario Total Cost: $42,436.63

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.93

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #6 - Concrete Channel

Scenario Description:

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to an existing collection basin and/or waste storage facility. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

After Situation:

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The purpose is to transfer liquids or manure slurry from one area to an existing collection basin or waste storage facility. Includes safety chain for equipment. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Bottom surface area of conc

Scenario Unit: Square Foot

Scenario Typical Size: 1,200.0

Scenario Total Cost: $25,251.15

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $21.04

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #7 - Concrete Channel, push-off wall at pond and safety gate

Scenario Description:

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to a collection basin and/or waste storage facility at the end of a push-off ramp. A safety gate is installed at the end of the push-off ramp. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

After Situation:

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The push-off ramp is a concrete cantilever structure that allows the waste to be moved into the storage facility. The purpose is to transfer liquids or manure slurry from one area to a collection basin or waste storage facility. Includes safety gate for human and animal exclusion. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Bottom surface area of conc

Scenario Unit: Square Foot

Scenario Typical Size: 1,200.0

Scenario Total Cost: $29,567.20

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $24.64

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #8 - Concrete channel, to medium sized wastewater reception pit

Scenario Description:

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to a 4300 gallon wastewater collection basin and/or waste storage facility. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

After Situation:

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The purpose is to transfer liquids or manure slurry from one area to a 8'x12'x6' collection basin or waste storage facility. Includes safety chain around the basin for equipment. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Bottom surface area of conc

Scenario Unit: Square Foot

Scenario Typical Size: 1,200.0

Scenario Total Cost: $38,348.93

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $31.96

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #9 - Concrete channel, to medium reception pit, 6 inch pipe to storage.

Scenario Description:

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to a 4300 gallon collection basin and/or waste storage facility. The wastewater is then transferred from the basin to the waste storage pond through a 6" diameter low pressure pipeline. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated. Waste transfer structures are needed to transfer wastes to a waste stor

After Situation:

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The waste transfer scenario is to scrape liquids or manure slurry from the waste production area down the channel to a 8'x12'x6' collection basin. From the basin it is then transferred through a 6" pipe 500 feet to the waste storage pond. The scenario also includes a safety chain around the basin. The transfer pipe is a 6" diameter gasketed PVC SDR 41 low pressure pipeline. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation costs for trench excavation, pipe bedding and backfill. Transfer pump if needed must be contracted under pumping plant, PS 533. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Bottom surface area of conc

Scenario Unit: Square Foot

Scenario Typical Size: 1,200.0

Scenario Total Cost: $44,327.91

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $36.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #10 - Small Flush System, less than 1000 gallon per flush to reception pit, 8 inch pipe to storage.

Scenario Description:

Installation of a manure and wastewater collection system that includes materials and structures to flush waste from a concrete surface into a collection basin and transferred to a waste storage pond. This small flush system must have an adequate source for the flush water and will use an 8" diameter pipe. The system may include flush water tank, piping and valves, concrete flush lane, concrete curbs or gutter, precast manholes, sumps or catch basins. The animal waste will be transferred by a flush cycle released from the flush tank to rinse the concrete surface and carry the waste to a collection basin, into a pipe and to a waste storage pond. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.

Before Situation:

A small animal production facility does not have an efficient method for collecting and transferring the animal waste produced. A source of sufficient water or wastewater resources are available to design a flush system to clean the production floor and c

After Situation:

This practice scenario is suitable only where the water or wastewater supplies are available for operating a flush system to collect the animal waste deposited on the concrete surfaces. The design flush volume for a small wastewater flush system is less than 1000 gallons and requires no more than 50 feet of an 8 inch diameter pressure pipe for the flush pipe. The scenario includes materials and installation of a flush tank, piping and valves to manage the flush flow, concrete flush lane, concrete curbs or gutters to transfer the flow to a collection basin. The liquids then flow from the basin to the waste storage pond, an estimated length of 200 feet and requires an 8 inch diameter low pressure pipeline with an open outlet to the waste storage pond. The cost includes excavation, placement of bedding aggregate as needed, forming and placement of structures, conveyance pipeline with valves and structural backfill. Pump must be contracted under pumping plant, PS 533.

Feature Measure: 1000 Gallons of flush water

Scenario Unit: Gallon

Scenario Typical Size: 1,000.0

Scenario Total Cost: $23,437.05

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $23.44

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #11 - Wastewater Flush Transfer System, Pipes only, 12 inch diameter

Scenario Description:

Installation of the pipe for a manure and wastewater flush system that provides the structures to utilize recycled wastewater to flush waste from a concrete surface into a waste storage pond. This may include pipe and valves, concrete flush lane, concrete curbs or gutter. The animal waste will be transferred by recycled flush water through the pipe system to rinse the concrete surface and carry the waste to a waste storage pond. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.

Before Situation:

An animal production facility does not have an efficient method for collecting and transferring the animal waste produced. Wastewater however is available in a sufficient quantity to provide a flush cycle to clean the production floor and collect the wast

After Situation:

This practice scenario is suitable where wastewater can be recycled for a flush system. Supplemental piping is needed to install the recycled flush water as a means to collect the animal waste deposited on the concrete surfaces. The pipe design for the flush volume requires100 feet of 12 inch diameter pipe for pressure flow. The flushed wastes are then piped from an existing collection basin to the waste storage pond an estimated length of 200 feet through a 12 inch diameter low pressure pipe with an open outlet at the pond. The cost includes excavation, placement of bedding as needed, flush and conveyance pipelines with valves and pipe backfill. Pumps must be contracted under pumping plant, PS 533.

Feature Measure: Flush - pipes

Scenario Unit: Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $23,516.38

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $78.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #12 - Hopper gravity inlet, 24 inch diameter HDPE pipeline, to waste storage facility

Scenario Description:

Gravity flow conduit is typically a large diameter water tight HDPE sanitary sewer pipe used to transfer manure by gravity from one location to another. The gravity transfer system typically consists of an inlet structure or hopper with an adaptor to a smooth interior large diameter HDPE pipe. The pipe conveys the slurry waste liquid between the waste collection point and a manure storage or waste treatment structure. Adequate head on the pipe flow or change in elevation must be available for the gravity system to function and should be evaluated by the design engineer. This practice includes the inlet structure, transfer pipe plus an and all other fittings, trench excavation and backfill, labor and equipment for installation. This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns as it is not efficient in transporting the waste to the storage. The site has a change in elevation between production area an

After Situation:

Install an 80 foot long gravity transfer system of a precast collection hopper with an adaptor to a water tight smooth interior 24"diameter HDPE sanitary sewer grade pipe that will flow to an outlet at the site of manure treatment or storage. This scenario includes the collection hopper, pipe, inlet, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure there is adequate elevation drop before contracting. The transfer conduit will provide collection and containment of the manure slurry, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit: Foot

Scenario Typical Size: 80.0

Scenario Total Cost: $16,510.70

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $206.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #13 - 30 inch HDPE conduit, gravity flow, from existing inlet structure

Scenario Description:

Gravity flow conduit is typically a large diameter water tight HDPE sanitary sewer pipe used to transfer manure by gravity from one location to another. The gravity transfer system typically consists of an existing inlet structure or hopper with attachment to a smooth interior large diameter pipe. The pipe conveys the slurry waste liquid between the waste collection point and a manure storage or waste treatment structure. Adequate head on the pipe flow or change in elevation must be available for the gravity system to function and should be evaluated by the design engineer. This practice includes the pipe attachment to an existing inlet structure and all other fittings, trench excavation and backfill, labor and a equipment for installation. This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns as it is not efficient in transporting the waste to the storage. The site has a change in elevation between production area an

After Situation:

Install a 150 foot long 30" diameter water tight HDPE pipe to transfer manure by gravity from one location to another. A gravity transfer system typically consists of a sealed inlet at an existing waste collection structure to a smooth interior 30" sewer grade pipe that will gravity flow to an outlet at a site of manure treatment or storage. This scenario includes the pipe, inlet, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure there is adequate elevation drop before contracting. If required an inlet structure may be contracted under another scenario. The transfer conduit will provide collection and containment of the manure slurry, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit: Foot

Scenario Typical Size: 150.0

Scenario Total Cost: $24,395.18

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $162.63

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #14 - 12 inch diameter, Low pressure flow, PVC conduit

Scenario Description:

Low pressure flow conduit is typically a PVC pipeline used to transfer wastewater or manure slurry by pumping from one production location to a storage or treatment location. Low pressure flow PVC transfer pipelines can be between 3" and 30" diameter and are designed for a pumping pressure of no more than 100 psi. The low pressure transfer system typically consists of an inlet structure or hopper connected to a smooth interior PVC pipe sized to deliver the design flow. This practice includes the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and a equipment for installation. This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns. The site of waste collection or structure has the capacity to install a pumping plant but needs a pipeline to transfer the li

After Situation:

Install a 300 foot long 12 inch diameter low pressure wastewater pipeline to transfer wastewater or manure slurry from one location to another. The low pressure flow situation refers to pipe flow that has an unrestricted outlet and low pumping head pressure. A pumping plant will send the liquid through a pipe inlet at an existing waste collection basin into a 12 inch diameter pipeline to transfer the design volume to an outlet at the wastewater treatment or storage site. This scenario includes the pipe, inlet connection, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer before contracting. If required a pumping plant may be contracted under PS 533, Pumping Plant to support this system. The low pressure transfer conduit will provide collection, transfer and containment of the manure slurry, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit: Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $25,219.66

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $84.07

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #15 - 10 inch diameter, Low pressure flow PVC pipeline, from waste storage pond to land application site.

Scenario Description:

Low pressure flow pipeline used to transfer manure wastewater by a low pressure pump from the waste storage pond to the field where it is applied according to the CNMP. The pipeline moves the water from the pond through a buried mainline with low pressure outlets that spread the water on a vegetated treatment area or to a site where the water is applied through an existing field application system. Low pressure flow PVC transfer pipelines can be between 3" and 30" diameter and are designed for a pumping pressure of 100 psi or less. This practice includes the pipe plus an inlet riser structure, clean-out risers and outlet risers plus all other valves and fittings, trench excavation and backfill, labor and a equipment for installation. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area.

Before Situation:

The waste storage structure is separated from the application fields where wastewater nutrients are needed. Soil nutrients in the near fields have high phosphorus levels from over application near the waste storage facility. The current application operat

After Situation:

Install a 1000 foot long 10 inch diameter PVC gasketed IPS pipe that has an SDR of 41 and is water tight under low pressure flow to transfer the manure wastewater. An inlet riser and is located near the pump site of the waste storage pond and designed for the desired pumping pressure and flow volume for the application system. This scenario includes the pipe, inlet riser, couplers, air-vac vents, all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function. The transfer pipeline will deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $41,954.32

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $41.95

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #16 - 6 inch diameter, Pressure flow PVC pipeline, from waste storage pond to land application site.

Scenario Description:

Pressure flow pipeline used to transfer manure wastewater by pumping from the waste storage pond to the field where it is to be applied according to the CNMP. Pressure flow transfer pipelines can be between 3" and 12" diameter but 6" diameter is a commonly used pipe size. Pressure pipe will handle an internal pumping pressure between 130 and 200 psi depending on the designed pumping system and must have gasketed joints to seal for the wastewater transfer. The pressure pipe moves the water by pumping from the intake riser location, through a buried mainline with outlet risers spaced at 300 ft intervals for a traveler applicator. This practice includes the pipe plus an inlet riser structure, clean-out risers and outlet risers plus all other valves and fittings, trench excavation and backfill, labor and a equipment for installation. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area.

Before Situation:

The waste storage structure is separated from the application fields where wastewater nutrients are needed. Soil nutrients in the near fields have high phosphorus levels from over application near the waste storage facility. The current application operat

After Situation:

Install a 1000 foot long 6 inch diameter PVC gasketed IPS pipe that has an SDR of 21 and is water tight under pressure flow to transfer the manure wastewater. An inlet riser and is located near the pump site of the waste storage pond and designed for the desired pressure and flow for the application system. This scenario includes the pipe, inlet riser, couplers, air-vac vents, all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function. The transfer pipeline will deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $21,121.33

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $21.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #17 - Agitator, small, mixing contents of a reception pit that is no more than 10 ft. deep.

Scenario Description:

This scenario is for a manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the production source to a storage facility for proper utilization. This agitator is typically no more than 15 HP and is used for smaller waste storage facilities that are less than 10 feet deep. This scenario does not include a pump. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.

Before Situation:

In this typical setting, the operator has a small waste storage structure from a confined animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.

After Situation:

The typical installation would be for a small manure 10 HP agitator to put settled manure solids into suspension for removal from an animal waste storage structure and transfer to the next step of waste treatment, utilization or storage. Part of an animal waste management system to address water quality concerns. If required a wastewater reception pit, concrete channel or transfer conduit scenario may need to be contracted to support the operation of this waste transfer system equipment.

Feature Measure: Agitator for wastewater, ins

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $12,688.63

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12,688.63

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #18 - Agitator, medium, mixing contents of a reception pit that is 10 ft to 15 ft. deep.

Scenario Description:

This scenario is for a manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the storage facility to a site for proper utilization. This agitator is typically 30 HP and is used where the waste storage facility tank or pond is between 10 and 15 feet deep. This scenario does not include a pump. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.

Before Situation:

In this typical setting, the operator has waste production from a confined animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.

After Situation:

A typical installation would be for a medium 30 HP manure agitator to put settled manure solids into suspension for removal from an animal waste storage structure and transfer to the next step of waste treatment, utilization or storage. Part of an animal waste management system to address water quality concerns. If required a wastewater reception pit, concrete channel or transfer conduit scenario may need to be contracted to support the operation of this waste transfer system equipment.

Feature Measure: Agitator for wastewater, ins

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $13,842.49

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13,842.49

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 634 - Waste Transfer

Scenario: #19 - Agitator, large, mixing contents of a reception pit that is over 15 ft. deep.

Scenario Description:

This scenario is for a large manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the storage facility to a site for proper utilization. This agitator is typically 100 HP and is used where the waste storage facility tank or pond is greater than15 feet deep. This scenario does not include a pump. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.

Before Situation:

In this typical setting, the operator has waste production from a confined animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.

After Situation:

A typical installation would be for a large 100 HP manure agitator to put settled manure solids into suspension for removal from an animal waste storage structure and facilitate the transfer of this material to the next step of waste treatment or utilization. This agitator is for a tank deeper than 15 feet and is part of an animal waste management system to address water quality concerns. This covers the cost of the agitator equipment materials and labor for the electrical hook-up.

Feature Measure: Agitator for wastewater, ins

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $15,425.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $15,425.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 635 - Vegetated Treatment Area

Scenario: #1 - Graded Area, Gravity Flow Surface Application

Scenario Description:

This is a permanent herbaceous vegetative area or channel installed down slope from a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected and released with a controlled gravity outflow into the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Waste Separation Facility (632), Manure Transfer (634), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

Before Situation:

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:

Typical VTA is 1.0 ac in size, includes a gravel trench for distribution flow (sheet flow) into the VTA. Typically requires grading and shaping, gravel spreader trenches and perforated pipe to maintain sheet flow throughout the VTA. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632). For milkhouse waste, Waste Treatment (629) could be contracted to provide pre-treatment prior to being released into the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

Feature Measure: Amount of VTA installed

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $10,021.85

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $10,021.85

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 635 - Vegetated Treatment Area

Scenario: #2 - Graded Area, Pumped Into A Basin, Gravity Flow Surface Application

Scenario Description:

This is a permanent herbaceous vegetative area or channel located upslope from the livestock production area. The topography of the site requires wastewater to be pumped uphill to the VTA designed system. Wastewater (runoff or milking parlor wastewater) is properly collected at the production area and pumped uphill to a shallow tank or basin where it has a controlled gravity outflow into the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629).

Before Situation:

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:

Typical VTA is 1.0 ac in size, includes the installation site to be upslope from the production area with a shallow tank or basin that provides a controlled gravity outflow into the VTA. Typically requires grading and shaping, gravel spreader trenches and perforated pipe to maintain sheet flow throughout the VTA. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632) and Pumping Plant (533) to get the wastewater upslope to the VTA distribution point. For milkhouse waste, Waste Treatment (629) could be contracted to provide pretreatment prior to being released into the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

Feature Measure: Amount of VTA installed

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $17,354.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $17,354.47

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 635 - Vegetated Treatment Area

Scenario: #3 - Graded Area, Mechanical Distribution

Scenario Description:

This is a permanent herbaceous vegetative area located adjacent to a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected at the production area and pumped to mechanically distribute wastewater onto the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

Before Situation:

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:

Typical VTA is 1.0 ac in size, includes the sizing, grading and shaping of the VTA area. Typically requires grading and shaping to maintain sheet flow onto the VTA. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632) and Pumping Plant (533) to get the wastewater to the VTA mechanical distribution component that is contracted using Irrigation System, Sprinkler (442). For milkhouse waste, Waste Treatment (629) could be contracted to provide pretreatment prior to being pumped and distributed onto the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

Feature Measure: Amount of VTA installed

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $3,168.70

Total Cost per Unit: $3,168.70

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 635 - Vegetated Treatment Area

Scenario: #4 - Existing Vegetative Area, Gravity Flow Surface Application

Scenario Description:

An existing permanent herbaceous vegetated area that meets the requirements for a VTA and is used as an overland flow area for nutrient rich runoff treatment. A flow distribution component is installed to achieve sheet flow at the start of the VTA. Clean runoff is diverted where possible. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich runoff that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment Area (629)

Before Situation:

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:

Typical VTA is 1.0 ac in size, includes gravel trenches and perforated pipe to establish sheet flow into the VTA where an existing permanent herbaceous vegetated area meets the requirements for a VTA. Does not include any grading or seeding. The VTA practice will provide a controlled release of nutrient rich runoff into an existing vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich runoff and prevent contamination of surface and ground water resources.

Feature Measure: Amount of VTA treating was

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $12,056.01

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12,056.01

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 635 - Vegetated Treatment Area

Scenario: #5 - Existing Area, Pod Sprinkler System Distribution

Scenario Description:

This is a permanent herbaceous vegetative area located adjacent to a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected at the production area and pumped to mechanically distribute wastewater onto the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

Before Situation:

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:

Typical VTA is 2.0 ac in size. Typically does not require grading and shaping to maintain as uniform application onto the VTA is made through a mobile pod type sprinkler system. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632) and Pumping Plant (533) to get the wastewater to the VTA. The system is sized such that the total number of Pods will distribute wastewater to half of the VTA, 1 ac. The pods will be relocated to distribute wastewater to the other half of the VTA. The VTA is 400 ft x 220 ft. A 400 ft pipeline with 8 risers spaced 50 ft apart extends down one side of the VTA. Each Pod Line is 200 ft long with 5 pods spaced at 40 ft increments. The total number of Pods is 20 (8 risers/2 x 5 pods/line = 20 pods). For milkhouse waste, Waste Treatment (629) could be contracted to provide pretreatment prior to being pumped and distributed onto the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater onto a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

Feature Measure: Amount of VTA installed

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $13,587.55

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6,793.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 636 - Water Harvesting Catchment

Scenario: #35 - Surface Catchment

Scenario Description:

Construct an apron, approximately 50 feet wide by 90 feet long, utilizing: a plastic or rubber membrane laid on a prepared ground surface; or an asphalt or concrete surface with curbing; to collect rain water. Divert collected water from the surface catchment by gravity through an 8" diameter, PVC SDR-35 pipe to an existing tank or plastic-lined earthen reservoir. Exclusion of animals is required, so conservation practice 382 - Fencing, may be needed to protect the catchment. Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 382 - Fencing; 614 - Watering Facility; 436 - Irrigation Reservoir; and 521A - Pond Sealing or Lining, Flexible Membrane.

Before Situation:

Inadequate water available to address resource concerns. Client hauls water to supply needs.

After Situation:

Design and construct an impervious surface as the primary collection component, and a pipe to convey the water to create a reliable water supply for livestock.

Feature Measure: Surface Area of Catchment

Scenario Unit: Square Yard

Scenario Typical Size: 500.0

Scenario Total Cost: $9,656.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $19.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 636 - Water Harvesting Catchment

Scenario: #36 - Elevated Catchment

Scenario Description:

Build a wooden frame, "post-and-pier" structure, with a corrugated metal roof (dimensions are 24 feet wide by 20 feet long), to collect rain water. The structure is supported by 9-each, "poured-in-place", concrete footings (dimensions are 2'x2' square x1' thick), 8 feet on-center, with tie-down straps. Divert collected water from catchment area with guttering and downspout through a 4" diameter PVC Schedule 40 pipe, to a tank (not included)for a reliable storage and subsequent use. Resource concerns: Livestock production limitation - Inadequate livestock water; Insufficient water - Inefficient use of irrigation water. Associated practices: 382 - Fence; 614 - Watering Facility; or 436 - Irrigation Reservoir.

Before Situation:

Inadequate water available to address resource concerns. Client hauls water to supply needs.

After Situation:

The guttering and downspouts collects the roof runoff and the water is conveyed through a pipe, by gravity, to a storage tank for use by livestock or a very small irrigation system. This system is the primary collection component of a Water Harvesting Catchment (CPS 636) facility. Divert collected water from roof with guttering and downspout through a 4" diameter PVC Sch-40 pipe,

Feature Measure: Surface Area of Catchment

Scenario Unit: Square Yard

Scenario Typical Size: 53.0

Scenario Total Cost: $9,546.97

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $180.13

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 636 - Water Harvesting Catchment

Scenario: #37 - Plastic tank, less than or equal to 1,000 gallons

Scenario Description:

Install a small, typically 1,000 gallons or less, above-ground polyethylene tank to store rainwater from an impervious surface on 6" of well-compacted drain rock or a 4" thick reinforced concrete support pad. The typical dimensions of the tank are 72" in diameter and 66" tall. The scenario also assumes a 96" diameter gravel base or concrete pad to extend a minimum of 12" past the base of tank for adequate foundation support. Stored water can be used with watering facilities, irrigation systems, or other conservation practices. The tank shall be constructed of approved materials that stores adequate quantity and quality of water for storage and or direct drinking access. Additional components may be needed to channel water from the impervious surface to the storage tank. All components used will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Resource concerns addressed include: Inadequate water quantity for livestock, wildlife or crops; habitat degradation, water quality, and undesirable plant productivity and health. Associated Practices: 614 - Watering Facility; 516 - Livestock Pipeline; 558 - Roof Runoff Structure; 620 - Underground Outlet; 430 - Irrigation Pipeline; 441 - Micro Irrigation; 533 - Pumping Plant; 342 - Critical Area Planting; 382 - Fencing

Before Situation:

Impervious surface currently exists, but there is no storage available. Water quantity is not available or supplemented to provide for wildlife, livestock watering, irrigation, or for other conservation practices.

After Situation:

A 1,000 gallon above-ground Poly tank with all tank materials, stabilized in place, with overflow protection, is installed to collect and store water from an impervious surface. Tank will provide or support adequate water storage capacity to ensure against inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, water quantity, crops, and undesirable plant productivity and health, and provide conservation benefit.

Feature Measure: Gallons of Tank Storage Cap

Scenario Unit: Gallon

Scenario Typical Size: 1,000.0

Scenario Total Cost: $2,558.11

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.56

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 638 - Water and Sediment Control Basin

Scenario: #1 - WASCOB, greater than 250 CY

Scenario Description:

Typical scenario s for the construction of 700 CY earthen embankment. Outlet is typically an underground outlet. An earthen embankment or combination ridge and channel generally constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin and mobilization of equipment. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices.

Before Situation:

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient tran

After Situation:

Water and Sediment Control Basis is constructed with 700 CY of excavation/earthfill with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities.

Feature Measure: CY of WASCOB Embankmen

Scenario Unit: Cubic Yard

Scenario Typical Size: 700.0

Scenario Total Cost: $2,856.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 638 - Water and Sediment Control Basin

Scenario: #2 - WASCOB topsoil

Scenario Description:

Typical scenarios for the construction of 700 CY earthen embankment. Prior to building the embankment, 6 inches of topsoil is removed and stockpiled. Outlet is typically an underground outlet. An earthen embankment or combination ridge and channel generally constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Topsoil is replaced following construction of the embankment. Costs include all equipment necessary to strip and stock pile topsoil, excavate, shape, grade and compact the Water and Sediment Control Basin, spread and replace topsoil after construction and mobilization of equipment. Seeding not included. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Work is done with dozer, scraper, or road grader.

Before Situation:

Site has shallow topsoil which if removed by earthwork for construction of embankment will significantly impact yields. Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over ti

After Situation:

Water and Sediment Control Basis is constructed with 700 CY of excavation/earthfill with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities.

Feature Measure: CY of WASCOB Embankmen

Scenario Unit: Cubic Yard

Scenario Typical Size: 700.0

Scenario Total Cost: $3,076.76

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.40

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 638 - Water and Sediment Control Basin

Scenario: #3 - WASCOB less than 250 CY

Scenario Description:

Typical scenario s for the construction of 200 CY earthen embankment. Outlet is typically an underground outlet. An earthen embankment or combination ridge and channel generally constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin and mobilization of equipment. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices.

Before Situation:

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient tran

After Situation:

Water and Sediment Control Basis is constructed with 200 CY of excavation/earthfill with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities.

Feature Measure: CY of WASCOB Embankmen

Scenario Unit: Cubic Yard

Scenario Typical Size: 200.0

Scenario Total Cost: $1,420.82

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7.10

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 642 - Water Well

Scenario: #1 - Drilled well for unconsolidated geologic sites with unstable rock formations (extensive casing)

Scenario Description:

Typical construction is for the installation of a well, in areas where sufficient water is known to occur 100 - 600 feet of the ground surface in unstable (unconsolidated) geologic formations. The well shall be drilled, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 400 feet. Well casings are 4-6" in diameter. Plastic casing is installed to a depth of 390 feet.

Before Situation:

Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

After Situation:

Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.

Feature Measure: Linear ft. of depth

Scenario Unit: Foot

Scenario Typical Size: 400.0

Scenario Total Cost: $19,525.94

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $48.81

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 642 - Water Well

Scenario: #2 - Drilled well for consolidated geologic sites with stable rock formations (limited casing)

Scenario Description:

Typical construction is for the installation of a well, in areas where sufficient water is known to occur 100 - 600 feet of the ground surface in stable (consolidated) geologic formations. The well shall be drilled, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 400 feet. Well casings are 4-6" in diameter. Steel casing is installed to a depth of 100 feet.

Before Situation:

Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

After Situation:

Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.

Feature Measure: Linear ft. of depth

Scenario Unit: Foot

Scenario Typical Size: 450.0

Scenario Total Cost: $17,575.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $39.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #1 - Habitat Monitoring and Management, Very-Low Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types were the native plant condition (i.e. T&E plant species) or wildlife habitat is the resource concern, and where very-low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 16 hours of labor per year.

Before Situation:

Rare or declining habitat is deficient and annual monitoring and adaptive management actions of very-low intensity and complexity will improved conditions.

After Situation:

Rare and declining habitat is improved by implementation of annual adaptive management actions of very- low intensity and complexity.

Feature Measure: Monitoring efforts and adap

Scenario Unit: Acre

Scenario Typical Size: 640.0

Scenario Total Cost: $955.64

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.49

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #3 - Rare or Declining Habitat Monitoring and Management, Medium Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified related to rare or declining habitats, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that impede monitoring efforts, replacing damaged fence markers, or other minor adaptive management activities). The adaptive mgmt. requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt. effort. Mowing of roads and trail is required to provide access for monitoring and management.

Before Situation:

Rare or declining habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

After Situation:

Rare or declining habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

Feature Measure: Monitoring efforts and adap

Scenario Unit: Acre

Scenario Typical Size: 160.0

Scenario Total Cost: $2,486.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $15.54

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #4 - Habitat Monitoring and Management, High Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per effort.

Before Situation:

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

After Situation:

Wildlife habitat is improved by implementation of annual adaptive management actions of high intensity and complexity.

Feature Measure: Monitoring efforts and adap

Scenario Unit: Acre

Scenario Typical Size: 80.0

Scenario Total Cost: $2,397.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $29.97

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #5 - Development of Shallow Micro-Topographic Features with Normal Farming Equipment.

Scenario Description:

This typical scenario is installed on open non-wetlands. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed to loosen the soil. Then the soil is excavated with normal farming equipment (e.g. tractor and box-blade) to a depth of 2-6 inches and immediately deposited. This lowering and raising of a box-blade restores the original micro-topographic features (6' X 6' depressions and mounds) common to most landscapes and landforms prior to clearing, tilling, and annual mowing. Restoration of shallow but frequent micro-topographic features has been lost by the smoothing action of tillage, mowing and the original land-clearing. This scenario it typically implemented for ecosystem restoration projects such as prairie restoration and range-land restoration, and particularly on moderately well-drained soils.

Before Situation:

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is

After Situation:

Shallow micro-depressions and mounds are numerous. This varied micro-topographic features provided varied moisture gradients required for high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the micro depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

Feature Measure: hours of tractor use

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $1,128.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $56.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #6 - Development of Deep Micro-Topographic Features with Heavy Equipment.

Scenario Description:

This typical scenario is installed on open non-wetlands, where micro-topographic features have been removed by past farming and/or ranching cultural practices. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed 2 weeks prior to excavation to kill existing vegetation and allow for proper dirt work. Then the soil is excavated with track equipment (dozer) to a depth of 6-12 inches and immediately deposited. This lowering and raising of a dozer -blade restores the original deep micro-topographic features (10' X10' depressions and mounds) common to many landscapes and landforms prior to the lands conversion to agricultural lands. This scenario it typically implemented for ecosystem restoration projects such as wetland restoration (herbaceous or prior to planting of woody species), prairie restoration and range-land restoration. It is most commonly applied to well-drained soils as the purpose is for the micro-depression to pond water for short duration (less than 7 days).

Before Situation:

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is

After Situation:

Deep (6 - 12 inch depth) micro-depressions and mounds are numerous. These varied micro-topographic features provide varied moisture gradients required for development of high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the deep micro-depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

Feature Measure: Hours

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $2,871.58

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $143.58

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #7 - Oyster reef restoration using planted oyster shells on a new site

Scenario Description:

Oyster shells are delivered to a staging area by supplier; the shells are loaded on to a barge then transported/delivered to reef site where they are dropped over the side to the floor of the Chesapeake Bay. Their presence also allows naturally occurring oyster spat to have appropriate medium to attach themselves to. The resources protected are the declining numbers of bivalves that process/filter sediment and nutrients out of the bay water. Their filtering improves water quality in the bay. NRCS AQUACULTURE PROGRAM Eligibility for Funding through the EQIP Chesapeake Bay Program is based upon concern for: the land-based shell preparation activities that contribute to restoration of shellfish habitat begin on the shore and continue on permanently submerged lands under lease to the state (the tidal bottoms within areas of the bays and rivers of Virginia that are capable of supporting oysters which biofilter Bay waters. Because tidal waters are considered waters of the State, almost all bottom aquaculture operations require a state lease. The participant must have control of the submerged land in the form of a lease or other documentation showing they have sufficient control to implement and manage the contracted activities).

Before Situation:

Declining numbers of reproducing native oysters results in less bivalve filtering of the Chesapeake Bay and reduced water quality.

After Situation:

Shallow water habitat/shoreline reef, planted with oyster shells, 2,000-5,000 bushels planted per acre to a thickness of 2-5 shells thick; The resulting artificial reef functions to improve water quality as oyster spat find, attach and grow within the provided shells.

Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $18,082.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $18,082.00

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #8 - Oyster reef enhancement at site with some existing cultch using planted oyster shells

Scenario Description:

Oyster shells are delivered to a staging area by supplier; the shells are loaded on to a barge then transported/delivered to reef site where an existing bed is located that needs augmentation. The cultch are dropped over the side to the floor of the Chesapeake Bay. Their presence also allows naturally occurring oyster spat to have appropriate medium to attach themselves to. The resources protected are the declining numbers of bivalves that process/filter sediment and nutrients out of the bay water. Their filtering improves water quality in the bay. NRCS AQUACULTURE PROGRAM Eligibility for Funding through the EQIP Chesapeake Bay Program is based upon concern for: the land-based shell preparation activities that contribute to restoration of shellfish habitat begin on the shore and continue on permanently submerged lands under lease to the state (the tidal bottoms within areas of the bays and rivers of Virginia that are capable of supporting oysters which biofilter Bay waters. Because tidal waters are considered waters of the State, almost all bottom aquaculture operations require a state lease. The participant must have control of the submerged land in the form of a lease or other documentation showing they have sufficient control to implement and manage the contracted activities).

Before Situation:

Declining numbers of reproducing native oysters results in less bivalve filtering of the Chesapeake Bay and reduced water quality.

After Situation:

Shallow water habitat/shoreline reef, planted with oyster shells, 1,000-3,000 bushels planted per acre to a thickness of 2-5 shells thick when added to existing cultch; The resulting artificial reef functions to improve water quality as oyster spat find, attach and grow within the provided shells.

Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $8,792.75

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8,792.75

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #13 - Habitat Monitoring, Native Forest Ecosystem

Scenario Description:

This scenario is applied to nonindustrial private forestland including those with wildlife as a modifier, where native plant conditions (T&E plants) or wildlife have been identified as the resource concern, and where moderate intensity and complexity of monitoring will treat the identified resource concern. One monitoring plot is needed for every 10-acres, due to viability of site conditions. Collection of data at each monitoring plot a Specialist and a Technician performing an average of 1.25 hours of labor each, per plot (including time to travel between the plot locations. Monitoring involves selection of random plot locations on a map, collection of photos at plot center, measure of forest stand age, measurement of % percent native groundcover, measurement of percent hardwood mid-story, measurement of stand density, determination of 50-year site index; and concludes with development of written adaptive management recommendations for advancing Longleaf ecosystem restoration on the site. Equipment needed in a monitoring team's kit includes a 10-factor prism, an increment borer, a digital camera, and a meter-square frame, a transect string. A conservation plan will normally repeat this monitoring scenario in consecutive years in order to evaluate the impact of other conservation practices planned and contracted to meet the restoration objective.

Before Situation:

Rare or declining native forest habitat is at risk due to the absence of management and the absence of monitoring, plus the unpredictable results from typical forest ecosystem management actions. A system of restoration practices is needed and so is annua

After Situation:

Rare and declining native forest habitat is improved by incorporating data collected during monitoring and by enhancing native ground cover quantity and quality. Future management for native forest ecosystem restoration is shaped by results from the monitoring and data collection.

Feature Measure: Acres monitored

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,205.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $24.11

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #117 - High Species Richness on Fallow or Non-Cropland, no FI

Scenario Description:

A resource concern has identified the need to re-establish, by planting of seed, a rare or declining plant community or community of local cultural importance. This practice scenario applies to areas not recently in crop production, including fallow cropland currently supporting native or non-native vegetation needing control prior to planting. The restoration effort will consist of planting a rich and diverse mix of species native to the area and representative of the historic plant community. Seed for the desired species are not of limited supply (e.g. local genotypes), difficult to produce, or excessively difficult to harvest. Light site preparation will occur prior to planting via herbicide burndown, burning, mowing or disking. If the plant community supported difficult to control species; those species were treated previous to the planting via the implementation of CPS Brush Management (Code 314) and/or Herbaceous Weed Control (Code 315).

Before Situation:

The site supports a common plant community (not rare or declining) in the region and does not require aggressive techniques for control, making the site suitable establishment of the identified rare or declining community or community of local cultural im

After Situation:

Desired species have been established, restoring the identified rare and declining community, or community of local cultural importance.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $6,951.84

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $695.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #118 - Very small acres planting with seedlings or plugs

Scenario Description:

A resource concern has identified the need to re-establish, by planting of live plants (seedlings or plugs) to restore the site to the natural rare or declining plant community or community of local cultural importance. This practice scenario applies to areas not recently in crop production, including fallow cropland currently supporting native or non-native vegetation needing control prior to planting. The restoration effort will consist of planting a rich and diverse mix of species native to the area and representative of the historic plant community. Light site preparation will occur prior to planting via herbicide burndown followed by burning, mowing or disking. If the plant community supported difficult to control species; those species were treated previous to the planting via the implementation of CPS Brush Management (Code 314) and/or Herbaceous Weed Control (Code 315).

Before Situation:

The site supports a common plant community (not rare or declining) in the region and does not require aggressive techniques for control and the site is suitable for the implementation of Restoration on Rare or Declining Habitats (CPS Code 643).

After Situation:

Desired species have been established by planting seedlings or plugs, restoring the identified rare and declining community, or community of local cultural importance.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $3,905.95

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,905.95

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #119 - Specialized Species on Cropland, with FI

Scenario Description:

On cropland, a resource concern has identified the need to re-establish, by planting of seed, a rare or declining plant community or community of local cultural importance. This practice scenario applies to areas in crop production. The restoration effort will consist of planting a mix of rich and diverse specialized of species that are native to the area and representative of the historic plant community. Seed for the specialized species are of limited supply (e.g. local genotypes), difficult to produce, or excessively difficult to harvest. Herbicide is applied, but no other seedbed preparation prior to seeding with the seed drill.

Before Situation:

Cropland suitable for the implementation of Restoration of Rare or Declining Communities (CPS 643).

After Situation:

Specialized species have been established, restoring the identified rare and declining community, or community of local cultural importance.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $18,895.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,889.50

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #120 - Specialized Species on Fallow or Non-Cropland, no FI

Scenario Description:

A resource concern has identified the need to re-establish, by planting of seed, a rare or declining plant community or community of local cultural importance. This practice scenario applies to areas not recently in crop production, including fallow cropland currently supporting native or non-native vegetation needing control prior to planting. The restoration effort will consist of planting a rich and diverse mix of species native to the area and representative of the historic plant community. Seed for the desired species are of limited supply (e.g. local genotypes), difficult to produce, or excessively difficult to harvest. Light site preparation will occur prior to planting via herbicide burndown, burning, mowing or disking. If the plant community supported difficult to control species; those species were treated previous to the planting via the implementation of CPS Brush Management (Code 314) and/or Herbaceous Weed Control (Code 315).

Before Situation:

The site supports a common plant community (not rare or declining) in the region and does not require aggressive techniques for control, making the site suitable establishment of the identified rare or declining community or community of local cultural im

After Situation:

Desired specialized species have been established, restoring the identified rare and declining community, or community of local cultural importance.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $14,368.34

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,436.83

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #121 - High Species Richness on Cropland, with FI

Scenario Description:

On cropland, a resource concern has identified the need to re-establish, by planting of seed, a rare or declining plant community or community of local cultural importance. This practice scenario applies to areas in crop production. The restoration effort will consist of planting a rich and diverse mix of species native to the area and representative of the historic plant community. Seed for the desired species are not of limited supply (e.g. local genotypes), difficult to produce, or excessively difficult to harvest. Herbicide is applied, but no other seedbed preparation prior to seeding with the seed drill.

Before Situation:

Cropland suitable for the implementation of Restoration of Rare or Declining Communities (CPS 643).

After Situation:

Desired species have been established, restoring the identified rare and declining community, or community of local cultural importance.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $11,478.50

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,147.85

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #3 - Habitat Monitoring and Management, Medium Intensity and Complexity

Scenario Description:

This scenario is applied to wetland areas located on all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures). The adaptive mgmt. requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt. effort. Mowing of roads and trail is required to provide access for monitoring and management.

Before Situation:

Wetland wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

After Situation:

wetland wildlife habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

Feature Measure: Monitoring efforts and adap

Scenario Unit: Acre

Scenario Typical Size: 160.0

Scenario Total Cost: $2,486.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $15.54

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #4 - Habitat Monitoring and Management, High Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per effort.

Before Situation:

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

After Situation:

Wildlife habitat is improved by implementation of annual adaptive management actions of high intensity and complexity.

Feature Measure: Monitoring efforts and adap

Scenario Unit: Acre

Scenario Typical Size: 80.0

Scenario Total Cost: $3,134.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $39.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #5 - Development of Shallow Micro-Topographic Features with Normal Farming Equipment.

Scenario Description:

This typical scenario is installed on non-forested wetlands, including open lands prior to tree planting. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed to loosen the soil. Then the soil is excavated with normal farming equipment (e.g. tractor and box-blade) to a depth of 2-6 inches and immediately deposited. This lowering and raising of a box-blade restores the original micro-topographic features (6' X 6' depressions and mounds) common to most landscapes and landforms prior to clearing, tilling, and annual mowing. Restoration of shallow but frequent micro-topographic features has been lost by the smoothing action of tillage, mowing and the original land-clearing. This scenario it typically implemented for ecosystem restoration projects such as prairie restoration and range-land restoration, and particularly on moderately well-drained soils.

Before Situation:

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is

After Situation:

Shallow micro-depressions and mounds are numerous. This varied micro-topographic features provided varied moisture gradients required for high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the micro depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

Feature Measure: hours of tractor use

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $1,128.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $56.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #6 - Development of Deep Micro-Topographic Features with Heavy Equipment.

Scenario Description:

This typical scenario is installed on non-forested wetlands (or open land prior to tree planting), where micro-topographic features have been removed by past farming and/or ranching cultural practices. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed 2 weeks prior to excavation to kill existing vegetation and allow for proper dirt work. Then the soil is excavated with track equipment (dozer) to a depth of 6-12 inches and immediately deposited. This lowering and raising of a dozer -blade restores the original deep micro-topographic features (10' X10' depressions and mounds) common to many landscapes and landforms prior to the lands conversion to agricultural lands. This scenario it typically implemented for ecosystem restoration projects such as wetland restoration (herbaceous or prior to planting of woody species), prairie restoration and range-land restoration. It is most commonly applied to well-drained soils as the purpose is for the micro-depression to pond water for short duration (less than 7 days).

Before Situation:

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is

After Situation:

Deep (6 - 12 inch depth) micro-depressions and mounds are numerous. These varied micro-topographic features provide varied moisture gradients required for development of high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the deep micro-depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

Feature Measure: Hours

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $2,871.58

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $143.58

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #32 - Establishment of seasonal wildlife forage or cover on non-cropland

Scenario Description:

The habitat assessment identifies the need to provide seasonal forage or cover for target wildlife species or guild. This habitat need will be met through the establishment of annual plants by planting of seed. The typical scenario will occur on areas supporting perineal herbaceous vegetation, not currently in cropland. Due to existing dense vegetation, these area will need to be mowed 2-3 weeks prior to disking (primarily disking), then followed by a light disking. Seed bed preparation will be furthered by firming the seed bed by cultipacking the site. Mixed fertilizer is required to establish planted wildlife forage. A seed mix consisting of annuals is typical for this activity.

Before Situation:

The existing habitat has an excess of herbaceous perineal habitat suitable for cover, but is lacking high quality forage seasonal forage, or the cover conditions is too thick and establishment of annuals create a diverse cover condition for the target wil

After Situation:

The availability of high-quality seasonal forage for the target wildlife species is provided and target wildlife health is improved, and populations are increased.

Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,868.98

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $186.90

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #33 - Establishment of annuals for wildlife on cropland, without FI

Scenario Description:

The habitat assessment identified the need to provide seasonal forage or cover for target wildlife species or guild. This identified habitat need will be met through the establishment of annual vegetation by planting of seed. This typical scenario is that this activity will occur on cropland, but outside of the normal cropping season. Thus, income will not be foregone. Seed bed preparation will be furthered by firming the seed bed by cultipacking the site. The only fertilizer need is N as this is cropland and P and K levels are sufficient.

Before Situation:

Cropland that fails to provide adequate wildlife habitat (forage and/or cover) seasonally for the target wildlife species..

After Situation:

The availability of high-quality seasonal forage for the target wildlife species is provided and target wildlife health and populations are increased.

Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,294.99

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $129.50

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #34 - Establishment of annual vegetation on cropland, with FI

Scenario Description:

The typical scenario is applied on cropped wetlands (cropland). The habitat assessment identified the lack of wildlife forage or cover during the same season of year as crops are grown. In response to the need to provide wetland dependent wildlife needed forage or cover during the cropping season, annual wildlife forages will be planted on cropland for one year, in lieu of the traditional cash crop. Seedbed preparation is limited to one light disking and cultipacking. The only fertilizer need is a light application of N as cropland P and K levels are sufficient. These wildlife forages and/or seasonal cover are planted in lieu of the cash crop, such as a corn and soybean rotation. Thus, income from the traditional cash crop will be foregone for the year.

Before Situation:

The existing habitat is cropland, lacking high quality forage for cover during the cropping season.

After Situation:

Annual wildlife forages are planted in lieu of a cash crop. Target wildlife health is improved and local populations are increased.

Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $5,235.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $523.54

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #2 - Habitat Monitoring and Management, Low Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 8 hours labor per year.

Before Situation:

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of low intensity and complexity.

After Situation:

Wildlife habitat is improved by implementation of annual adaptive management actions of low intensity and complexity.

Feature Measure: Monitoring efforts and adap

Scenario Unit: Acre

Scenario Typical Size: 160.0

Scenario Total Cost: $812.88

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #3 - Habitat Monitoring and Management, Medium Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures). The adaptive mgmt. requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt. effort. Mowing of roads and trail is required to provide access for monitoring and management.

Before Situation:

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

After Situation:

Wildlife habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

Feature Measure: Monitoring efforts and adap

Scenario Unit: Acre

Scenario Typical Size: 160.0

Scenario Total Cost: $2,486.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $15.54

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #4 - Habitat Monitoring and Management, High Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per effort.

Before Situation:

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

After Situation:

Wildlife habitat is improved by implementation of annual adaptive management actions of high intensity and complexity.

Feature Measure: Monitoring efforts and adap

Scenario Unit: Acre

Scenario Typical Size: 80.0

Scenario Total Cost: $3,134.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $39.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #5 - Development of Shallow Micro-Topographic Features with Normal Farming Equipment.

Scenario Description:

This typical scenario is installed on open non-wetlands. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed to loosen the soil. Then the soil is excavated with normal farming equipment (e.g. tractor and box-blade) to a depth of 2-6 inches and immediately deposited. This lowering and raising of a box-blade restores the original micro-topographic features (6' X 6' depressions and mounds) common to most landscapes and landforms prior to clearing, tilling, and annual mowing. Restoration of shallow but frequent micro-topographic features has been lost by the smoothing action of tillage, mowing and the original land-clearing. This scenario it typically implemented for ecosystem restoration projects such as prairie restoration and range-land restoration, and particularly on moderately well-drained soils.

Before Situation:

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is

After Situation:

Shallow micro-depressions and mounds are numerous. This varied micro-topographic features provided varied moisture gradients required for high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the micro depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

Feature Measure: hours of tractor use

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $652.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $32.63

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #6 - Development of Deep Micro-Topographic Features with Heavy Equipment.

Scenario Description:

This typical scenario is installed on open non-wetlands, where micro-topographic features have been removed by past farming and/or ranching cultural practices. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed 2 weeks prior to excavation to kill existing vegetation and allow for proper dirt work. Then the soil is excavated with track equipment (dozer) to a depth of 6-12 inches and immediately deposited. This lowering and raising of a dozer -blade restores the original deep micro-topographic features (10' X10' depressions and mounds) common to many landscapes and landforms prior to the lands conversion to agricultural lands. This scenario it typically implemented for ecosystem restoration projects such as wetland restoration (herbaceous or prior to planting of woody species), prairie restoration and range-land restoration. It is most commonly applied to well-drained soils as the purpose is for the micro-depression to pond water for short duration (less than 7 days).

Before Situation:

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is

After Situation:

Deep (6 - 12 inch depth) micro-depressions and mounds are numerous. These varied micro-topographic features provide varied moisture gradients required for development of high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the deep micro-depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

Feature Measure: Hours

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $2,871.58

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $143.58

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #293 - Establishment of seasonal wildlife forage or cover on cropland, no FI

Scenario Description:

This typical scenario occurs on cropland. The habitat assessment identified the need to provide seasonal forage or cover for target wildlife species or guild. This habitat need will be met through the establishment of annual food plants or cover plants by planting of seed. The typical scenario for seasonal forage or cover will be established outside of crop season, thus FI is not needed. Seedbed preparation (light tillage) will be furthered by firming the seed bed by cultipacking the site. The only fertilizer need is N as this is cropland and P and K levels are sufficient. Cropland, so mobilization of equipment not needed.

Before Situation:

Cropland that fails to provided food or cover for target species at the proper location and season to meet the needs of wildlife.

After Situation:

The availability of high-quality seasonal forage or seasonal cover for the target wildlife species is provided. Target wildlife health is improved and populations are increased.

Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $1,893.82

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $189.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #294 - Establishment of seasonal forage or cover for wildlife on cropland, with FI

Scenario Description:

The habitat assessment identified the need to provide seasonal forage or cover for target wildlife species or guild. This habitat needs will be met through the establishment of annuals by planting of seed. The typical scenario is for cropland. Seed bed preparation is limited to one light disking, furthered by firming the seed bed by cultipacking the site. The only fertilizer need is N as this is cropland and P and K levels are sufficient. These wildlife forages or seasonal cover will be available for wildlife during the cropping season, and are in lieu of the cash crops typically planted on the field. Thus, income from the cash crop will be foregone for a year.

Before Situation:

Cropland does not provide forage or cover needed for wildlife during the season on dearth.

After Situation:

Annual wildlife forages are planted in lieu of a cash crop. Target wildlife health is improved and populations are increased.

Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $5,753.82

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $575.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #295 - Establishment of seasonal forage or cover for wildlife on non-cropland.

Scenario Description:

The habitat assessment identifies the need to provide seasonal forage or cover for target wildlife species or guild. This habitat need will be met through the establishment of annual plants by planting of seed. The typical scenario is that this activity will occur on herbaceous areas, not currently in cropland. Due to existing dense vegetation, these area will need to be mowed 2-3 weeks prior to disking (primarily disking), then followed by a light disking. Seed bed preparation will be furthered by firming the seed bed by cultipacking the site. Mixed fertilizer is required to establish planted wildlife seasonal forage or seasonal cover..

Before Situation:

The existing habitat has an excess of herbaceous perineal habitat, but is lacking high-quality seasonal forage, or the existing cover is too dense and cover conditions found in annual plant communities are absent.

After Situation:

The availability of high-quality seasonal forage, or cover condition common in annual plant communities is provided and target wildlife health and populations are increased.

Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $3,654.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $365.48

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #296 - Interseeding Milkweed Into Existing Habitat

Scenario Description:

Inter-seeding milkweed into an existing stand of vegetation that has sufficient nectar plant richness and distribution, but lacks reproductive habitat (milkweed is lacking). Existing vegetation will be treated with herbicides in strips. Entire area will be burned or mowed prior to application of herbicides to 6-10 foot wide strips. Drilling of milkweed will be in the treated (herbicide strips). Seeding in strips will be 25% of the field.

Before Situation:

An open field that may support enough forb species richness, abundance and distribution to provide good or excellent monarch nectaring habitat, but milkweed is lacking. These conditions fail to meet the limiting factor for monarchs as required to meet Upl

After Situation:

The open field supports good or excellent monarch reproductive habitat. Application of the Monarch WHEG finds the habitat quality rating to be good or excellent.

Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $1,030.70

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $206.14

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 646 - Shallow Water Development and Management

Scenario: #1 - Shallow Water Management

Scenario Description:

This scenario addresses inadequate habitat for fish and wildlife on cropland. The resource concern is addressed by providing shallow water habitat for wildlife such as shorebirds, waterfowl, wading birds, mammals, fish, reptiles, amphibians, and other species that require shallow water for at least part of their life cycle. Sites are flooded up to a depth of 18" with an average depth of 9". Water is provided by natural flooding and/or precipitation.

Before Situation:

There is inadequate habitat to provide optimum resting, nesting, and feeding habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.).

After Situation:

A single or series of shallow water areas that are managed per standard and specification. Water levels are regulated to maintain temporary wildlife habitat. Timing and duration of flooding and de-watering is dependent on specific species requirements. Water is pumped into area to be flooded. Flooded sites vary from mudflats to water depths of 18" with an average depth of 9". The hydrologic conditions of ponding and saturation (frequency, depth, duration, timing) provides optimum seasonal habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.). If needed and dikes or water control structures are not currently present on the fields planned to be flooded, these practices may be planned for the same fields and cost shared under Structure for Water Control (587) and Dike (356). If a natural water source (i.e. precipitation or flooding) is not available, Pumping Plant (533) may be cost shared to provide a water source. Depending on local conditions, other Conservation Practices may also be required.

Feature Measure: Acre of shallow water

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $147.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $147.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 646 - Shallow Water Development and Management

Scenario: #2 - Shallow Water Management, High Level

Scenario Description:

This scenario addresses inadequate habitat for fish and wildlife on cropland. To facilitate practice code 643, 644, 645, or 395, seasonal shallow water is provided annually for target species by purchasing of water, lifting of such water, monitoring of the water quality, response by target plant community, use by target flora or fauna. Sites are flooded up to a depth of 18"with an average depth of 9". Monitoring and adaptive management accomplished of existing water control structures is accomplished to meet very specific conditions needed to address previously identified degraded plant conditions or inadequate habitat for fish and/or wildlife. This high-level management is applied to lands used for crop, pasture, hay, forests or wildlife lands where target flora and fauna have been identified as a primary concern. Loss of some level of crop, forage, hay or forest products may occur depending on site specific conditions.

Before Situation:

The site has existing infrastructure (reliable water source, dikes, water control structures, pumps, gates) to provide a reliable seasonal water source. The site is not subject to frequent natural flooding. The potential benefits to target fauna and flora

After Situation:

A single or series of shallow water areas that are managed per standard and specification. Water levels are regulated to maintain temporary wildlife habitat. Timing and duration of flooding and de-watering is dependent on specific species requirements. Water is pumped into area to be flooded. Flooded sites vary from mudflats to water depths of 18" with an average depth of 9". The hydrologic conditions of ponding and saturation (frequency, depth, duration, timing) provides optimum seasonal habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.). If Dikes or Water Control Structures are not currently present on the fields planned to be flooded, these practices may be planned for the same fields and cost shared under Structure for Water Control (587) and Dike (356). If a natural water source (i.e. precipitation or flooding) is not available, Pumping Plant (533) may be cost shared to provide a water source. Depending on local conditions, other Conservation Practices may also be required.

Feature Measure: Acre of shallow water

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $334.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $334.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #1 - Habitat Mowing

Scenario Description:

This scenario address inadequate habitat for fish and wildlife where setting back succession by mowing incoming woody species will improve habitat for the target species. Mowing can be used to increase structural diversity by creating areas of shorter vegetation preferred by some species or certain life stages of species. This scenario can be used nationwide. The typical setting for this scenario is at the edge of crop fields, in pastures, at the edge of woodlands or brushy areas, and in odd areas such as pivot corners. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management or 666 forest stand improvement should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required use conservation practice 550 range seeding or 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 666 forest stand improvement to remove trees.

Before Situation:

The site is static or trending to later successional plant community. The disturbance regime to maintain an earlier successional plant community is lacking. Pastures are often monotypic, lacking in diversity. Competition for sunlight from dense grass stan

After Situation:

Early successional habitat maintained. Mowing has provided more sun light for forb establishment. The heterogeneity of the habitat structure has been increased.

Feature Measure: width and length of treated

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $65.05

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $32.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #2 - Habitat Disking

Scenario Description:

This practice addresses inadequate wildlife habitat for species requiring early successional habitat. This scenario provides early successional habitat by setting back succession and manipulating species composition by disking vegetation and creating bare ground. The typical setting for this scenario is at the edge of crop fields, in pastures, and in odd areas such as pivot corners. This scenario is applicable nationwide. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management or 666 forest stand improvement should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required, use conservation practice 550 range seeding or 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 666 forest stand improvement to remove trees.

Before Situation:

The site is static or trending to higher successional plant species. The disturbance regime to maintain a lower successional stage is lacking. Pastures are often monotypic, lacking in diversity. Bare ground for seedling establishment is absent. Stands are

After Situation:

The application of this scenario improves wildlife habitat for species requiring early successional plant communities by reducing competition and creating bare ground for the establishment of early successional plants. Additionally, brood rearing habitat is improved both by the resultant food resources and the increased openness of the plant community that allows chicks to negotiate the terrain and exploit those food resources.

Feature Measure: width and length of treated

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $376.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $188.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #3 - Early Successional Habitat Forest Opening (Clearcut)

Scenario Description:

Early successional habitat (ESH) openings involve creating 2-acre clearcut patches in closed-canopy or degraded stands using hand tools such as chainsaws. The goal is to provide openings of early successional habitat within a matrix of later successional, more mature forested habitat. Resource concerns include: Undesirable plant productivity and health, Inadequate structure and composition, and habitat degradation. ESH openings within central hardwood stands progress from sapling to pole-timber sized trees, and the range of successional stages has the potential to provide optimal food (increased soft mast and browse) and cover (high stem density, down woody debris) for several years, which benefits the numerous life stages of early successional target wildlife. A professional wildlife biologist will delineate ESH openings at least 2 acres or greater in size. Location of wildlife openings can be adjusted to avoid steep slopes, riparian zones, and other environmentally sensitive areas, but can be located in xeric to mesic conditions. Tree tops can be removed to provide optimal conditions for tree and shrub regeneration, or left in place to deter deer browse while still providing open-canopy conditions that promotes early succession. To ensure a diversity of successional stages and maintain the overall forest habitat matrix, ESH openings should not exceed 25% of total forestland acreage per stand or tract, as determined by a professional wildlife biologist. Felling trees with chainsaws should occur from November 15th through March 31st to minimize disturbance to nesting wildlife, especially federally listed Indiana bats.

Before Situation:

The existing stand is closed-canopy with very little understory vegetation (tree reproduction or herbaceous species). The stand likely has been degraded in value by past harvesting practices so that the level of acceptable growing stock is too low to just

After Situation:

A new, young stand of desirable trees, shrubs, briars, vines, and herbaceous species is established within the ESH opening because the existing tree canopy is removed allowing full sunlight to reach the ground. The ESH opening provides diversity within the overall forested habitat matrix, which diversifies habitat conditions to benefit a variety of wildlife. Within this ESH opening, succession progresses from mostly seedlings and herbaceous plants, to briars and saplings, to pole-sized stages, to eventual canopy closure in 15-20 years. Woody stem density will increase until the canopy closes, providing previously unavailable cover for reproduction, foraging, and escape used by a variety of game and non-game wildlife. Different species utilize the various stages of succession, and some use the entire continuum.

Feature Measure: width and length of treated

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $2,395.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,197.64

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #4 - Edge Feathering (Cutback Borders)

Scenario Description:

Edge feathering involves cutting overstory trees within a 30-50' zone along the edge of forestland using hand tools such as chainsaws. The goal is to create a transitional zone between later successional stages like mature forest and very early successional stages like open fields. The forest overstory is removing allowing more sunlight deeper into the forest edge, which releases shade-intolerant trees and shrubs that can provide optimal food (increased soft mast and browse) and cover (high stem density, down woody debris) for numerous life stages of early successional target wildlife. A professional wildlife biologist will delineate edge feathering areas so that they extend at least 30 feet into the edge to reduce predation, but width of the feathered area can vary. Leave trees or shrubs of special wildlife benefit, such as dogwoods, viburnums, serviceberry, etc. Leaving cut slash and debris within the cutback area provides additional wildlife cover. Edge feathering along a given forest edge can occur at different times (years) to provide diversity in stages of growth. Herbicides may be used to control regeneration of undesirable species. Resource concerns within this zone include: Inadequate structure and composition and habitat degradation. Felling trees with chainsaws should occur from November 15th through March 31st to minimize disturbance to nesting wildlife, especially federally listed Indiana bats.

Before Situation:

There is a "hard edge" (high contrast) between a closed-canopy forest with very little mid/understory herbaceous vegetation and an adjacent open field with very little woody cover. Little to no transitional habitat occurs between the two habitat types, hi

After Situation:

A transitional area of young trees, shrubs, briars, vines, and herbaceous species is established along and at least 30 feet into a forest edge because the existing tree canopy was removed allowing full sunlight to reach the ground. The feathered edge/cutback border provides strategically located habitat diversity, which benefits a variety of wildlife. Within this feathered edge, succession progresses from mostly seedlings and herbaceous plants, to briars and saplings, to pole-sized stages, to eventual canopy closure in 15-20 years. Woody stem density will increase until the canopy closes, providing previously unavailable cover for reproduction, foraging, and escape used by a variety of game and non-game wildlife. Different species utilize the various stages of succession, and some use the entire continuum. The early successional benefit is extended if additional/adjacent areas are treated in subsequent years, or if the same areas are treated again before canopy closure.

Feature Measure: width and length of treated

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $1,346.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $673.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #5 - Habitat Selective Herbicide

Scenario Description:

This scenario address inadequate habitat for fish and wildlife where setting back succession by applying herbicide to selectively control undesirable woody plants will improve habitat for the target species. Selective control of woody plants can increase habitat structural and botanical diversity by creating opportunities for grasses and forbs, preferred by target wildlife species during certain stages of life, to compete for sunlight, water and space. In this typical scenario a selective herbicide containing the active ingredient Imazapyr is applied by ground equipment to the target area. The typical setting for this scenario is at the edge of crop fields, the edge of pastures, the edge of forests, and in odd areas around agricultural operations.

Before Situation:

The site is static or trending to later successional plant community. The disturbance forces needed to maintain an earlier successional plant community is lacking. Pastures are often monotypic, lacking in diversity. Competition for sunlight from dense gra

After Situation:

Early successional habitat conditions are created or improved. The diversity of the habitat structure and composition has been increased.

Feature Measure: width and length of treated

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $93.84

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $46.92

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #6 - Habitat Non-Selective Herbicide

Scenario Description:

This scenario address inadequate habitat for fish and wildlife where setting back succession by applying herbicide to fully control undesirable plant growth will improve habitat for the target species. Thorough vegetation control is needed to increase habitat structural and botanical diversity by creating opportunities for grasses and forbs, preferred by target wildlife species during certain stages of life, to compete for sunlight, water and space. In this typical scenario a non-selective herbicide containing the active ingredient Glyphosate is applied by ground equipment to the target area. The typical setting for this scenario is at the edge of crop fields, the edge of pastures, the edge of forests, and in odd areas around agricultural operations.

Before Situation:

The site is static or trending to later successional plant community. The disturbance forces needed to maintain an earlier successional plant community is lacking. Pastures are often monotypic, lacking in diversity. Competition for sunlight from dense gra

After Situation:

Early successional habitat conditions are created or improved. The diversity of the habitat structure and composition has been increased.

Feature Measure: width and length of treated

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $30.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $15.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 649 - Structures for Wildlife

Scenario: #1 - Nesting Box, Small no pole

Scenario Description:
A structure is provided to support the nesting and rearing of smaller targeted species, such as bees and birds, and is directly mounted to a tree, building or other structure. Addresses resource concern for wildlife of inadequate cover/shelter

Before Situation:
The area lacks sufficient nesting habitat sites (natural cavities). A suitable location to mount the box is available.

After Situation:
The installation of nesting and rearing boxes support the life-cycle needs of targeted specs, such as birds, bats and pollinators. These structures/features enhance habitat, cover, and improve species survivability.

Feature Measure: Number of structures

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost:	$49.31	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$49.31	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 649 - Structures for Wildlife

Scenario: #2 - Nesting Box, Small, with wood pole

Scenario Description:

Constructing a nest box and mounting on a pole. A structure is provided to support the nesting and rearing of targeted species, such as pollinators and birds. Trees, buildings or other structures are not available. These structures are designed to meet targeted species biology and life history needs. Addresses Resource Concern: Inadequate Cover/Shelter.

Before Situation:

This area lacked sufficient nesting sites to support viable populations of targeted species. Location and conditions suggest that predator guards are not needed.

After Situation:

The installation nesting and rearing boxes support the life-cycle needs of targeted specs, such as blue birds and waterfowl. Location and conditions suggest that predator guards are not needed. These structures/features enhance habitat, cover, and improve species survivability.

Feature Measure: Number of structures with p

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $80.92

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $80.92

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 649 - Structures for Wildlife

Scenario: #3 - Nesting Box, Large

Scenario Description:

A structure is provided to support the nesting and rearing of larger targeted species such as waterfowl, bats and barn owls, and is directly mounted to a tree, building or other structure. These structures are designed to meet targeted species biology and life history needs. Addresses Resource Concern: Inadequate Cover/Shelter.

Before Situation:

The area lacks sufficient overall habitat conditions to support viable populations of targeted species. A suitable location to mount the box is available. Predator guards not needed.

After Situation:

The installation of nesting and rearing boxes support the life-cycle needs of targeted species, such as birds, bats and pollinators. Because of suitable location and conditions the nesting box can be directly mounted such as on a tree or building, thereby eliminating the need for mounting poles and predator guards. Species such as cavity dwelling birds and pollinators use this approach, but this treatment is not limited to those species. These structures/features enhance habitat, cover, and improve species survivability.

Feature Measure: Number of structures.

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $127.38

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $127.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 649 - Structures for Wildlife

Scenario: #4 - Nesting Box or Raptor Perch, Large, with pole

Scenario Description:
Constructing a nest box or rapture perch on a steel pole with a predator guard where needed. A structure is provided to support the nesting and rearing of larger targeted species such as wood ducks, bats, barn owls or to provide needed perches or nesting structures for raptures. Addresses Resource Concern: Inadequate Cover/Shelter.

Before Situation:
The area lacks sufficient overall nesting sites to support viable populations of targeted species. Predator guards provide needed protection of target species during nesting and rearing.

After Situation:
The installation of pole mounted nesting and rearing boxes support the life-cycle needs of targeted species, such as bats and waterfowl.

Feature Measure: Number of structures

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $532.55

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $532.55

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 649 - Structures for Wildlife

Scenario: #5 - Escape Ramp

Scenario Description:
Retrofit an existing watering trough/tank with an appropriately designed and installed wildlife escape ramp to reduce wildlife mortality and maintain water quality within the watering facility.

Before Situation:
Existing watering facilities lack escape potential for wildlife. This results in death of the small wildlife accessing the facility for water, and resulting poor water quality as the animal decays.

After Situation:
Watering facilities provide wildlife safe access. Water quality is improved within the watering facility and wildlife mortality is reduced.

Feature Measure: Each Ramp

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $90.06

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $90.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 649 - Structures for Wildlife

Scenario: #6 - Fence Markers, Vinyl Undersill

Scenario Description:
Existing fences are retrofitted with vinyl markers that increase wire visibility and reduce mortality due to collision for wildlife species of concern. Markers are installed approximately every 3 feet along top wire. Scenario is typically implemented along fences in potential high risk areas (red areas in SGI Fence Collision Risk Model) or where a known problem exists.

Before Situation:
Wire fences located in high risk areas pose a collision threat to wildlife of special concern.

After Situation:
Fence related mortality of species of special concern is reduced.

Feature Measure: feet of fence marked

Scenario Unit: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $295.64

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.22

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 649 - Structures for Wildlife

Scenario: #7 - Brush Pile - Small

Scenario Description:
Small brush piles are created to provide shrubby/woody escape cover for wildlife. Pushing or cutting of select small trees and placement in selected locations to provide wildlife cover. Typical scenario of 10' x 20' area for structure covered by interlocking limbs of trees less than 12 inches in diameter.

Before Situation:
The existing habitat lacks escape, ground nesting and safe loafing cover.

After Situation:
Small brush piles provide needed escape, ground nesting and safe loafing cover for targeted wildlife species.

Feature Measure: brush piles

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $42.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $42.30

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 649 - Structures for Wildlife

Scenario: #8 - Brush Pile - Large

Scenario Description:

Downed tree structures are created to provide shrubby/woody escape cover for wildlife. Existing sod will be killed prior to placement of tree structures. Felling of select trees and placement in selected locations to provide wildlife cover. Typical scenario of 30' x 50' area for structure covered by interlocking limbs of trees at least 12" in diameter.

Before Situation:

The existing habitat lacks escape, ground nesting and safe loafing cover.

After Situation:

Large brush piles provide needed escape, ground nesting and safe loafing cover for targeted wildlife species.

Feature Measure: brush piles

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $179.04

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $179.04

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 649 - Structures for Wildlife

Scenario: #9 - Rock Structure

Scenario Description:

This activity constructs piles of rock to provide habitat for wildlife where needed in both upland and aquatic systems, e.g. small mammals in uplands and aquatic cover/shelter to provide structure and nesting habitat for herpetefauna and/or fish in otherwise structurally deficient springs, wetlands and other fresh water aquatic systems (private ponds and lakes). Typical activity involves construction of quarried rock (riprap) 4-8 " in size, in piles randomly across the wetland area. Piles are approximately 7' L X 5' W X 3' H (5 tons/pile)

Before Situation:

Existing habitat is deficient in habitat structure and lacks shelter for various species of small mammals, amphibians, reptiles and/or fish when used in fresh water aquatic systems (private ponds and lakes).

After Situation:

Upland sites, springs, wetlands and other aquatic systems are enhanced/restored by the addition of habitat structure for loafing and escape and brood rearing.

Feature Measure: Rock Piles

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,565.10

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,565.10

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 649 - Structures for Wildlife

Scenario: #25 - Living Brush Piles/Hinge Cut Structures

Scenario Description:

This practice creates hinge cuts for wildlife cover, resting or loafing areas while providing valuable browse and cover for several game and non-game species. Hinge-cuts have been widely used across the country to provide ground cover for northern bobwhite (Colinus virginianus), cottontails (Sylvilagus spp.), Gambel's quail (Callipepla gambelii), and many other small mammals and birds. The hinge-cut trees also provide a readily available source of browse for deer as the trees will live for several years. The cut trees or shrubs also provide screening cover for deer and nesting cover for quail, turkey and other birds that utilize early successional understory habitats. Secondary benefits may increase herbaceous vegetative on the forest floor while releasing the best saplings for timber production. This enhancement applies to all range and hardwood forest land use acres with either low or inadequate ground cover. For forest land use acres, the activity is often used in intermediate to mature hardwood forest with an abundance of mid-level trees. Apply the activity throughout the forest in small patches as well as edge feathering to soften the hard edge and create a brushy early successional cover for edge-loving species.

Before Situation:

Forest stands are overstocked with homogenous or absent understory. This practice will add temporary understory while acting secondarily as release of more desirable species. In grasslands scattered shrub or small tress (i.e. red cedar) may provide habita

After Situation:

Hinge cut areas will consist of a minimum of ½ acre per 40 acres of eligible habitat, with a minimum range of 50 to 100 stems to be cut within the 40-acre minimum. Less desirable trees should be selected for cut while leaving more desirable better formed hardwoods. Cutting is placed so that the plant is not completely killed but is pushed, often in groups, to form living brush piles.

Feature Measure: stem cut

Scenario Unit: Acre

Scenario Typical Size: 0.5

Scenario Total Cost: $398.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $796.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 654 - Road/Trail/Landing Closure and Treatment

Scenario: #1 - Road/Trail Abandonment/Rehabilitation (Light)

Scenario Description:

Reshaping a 12' wide trail to natural conditions. This scenario includes using light equipment such as a backhoe for the installation of water control devices such as water bars, rolling dips, controlling access, use of woody residue and pulling drainages on 500 feet of road on 35% hill slopes and a moderate grade. Cool season grasses are re-established by seeding. Some light hand work may be needed to clear site for the equipment. This practice addresses one or more resource concerns: Excessive sediment in surface waters, Habitat degradation, and Concentrated flow erosion. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are causing the resource concerns.

Before Situation:

The legacy trail/roads are severely affecting wetland/riparian areas, slope stability, and water quality. The trail/roads can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access is possible. Ther

After Situation:

The resource concerns are addressed by the abandonment of the road and its drainage elements, and by re-seeding to native grasses.

Feature Measure: length

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $2,810.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 654 - Road/Trail/Landing Closure and Treatment

Scenario: #2 - Road/Trail removal and restoration (Vegetative)

Scenario Description:

Minimal re-shaping to natural conditions using light equipment and the establishment of permanent vegetation. This scenario includes using smaller equipment (ag tractor/skidsteer/small dozer/backhoe/) for the installation of water control devices such as water bars and rolling dips, controlling access, and pulling drainages on 500 feet of 12' wide road on 5%-35% hill slopes and little grade. The site is re-vegetated to permanent improved grass and temporarily protected with a thin layer of hay mulch. Soil amendments are applied as per the FOTG guidance. This practice addresses one or more resource concerns: Excessive sediment in surface waters, Wildlife habitat degradation, and Concentrated flow erosion. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are causing the resource concerns.

Before Situation:

Legacy trail/road is not necessary and is affecting wetlands, riparian areas, water quality, and possibly T&E species. The trail/road can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access was p

After Situation:

The re-vegetated, eliminated road addressed the resource concern.

Feature Measure: length of landing/trail(s)

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $2,535.03

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.07

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 655 - Forest Trails and Landings

Scenario: #2 - Trail and Landing Installation

Scenario Description:

Construction of forest trails and landings for the purpose of providing access to a gently sloping forested tract, Access will allow the application of other conservation practices, monitoring and the removal of forest products. It is not, however, to be used if the installation is done as part of a commercial operation such as timber harvesting. In such a case, the Scenario 1 should be used. Installation will include removal of trees and brush as needed, a minimum amount of blading and soil disturbance, and the installing of water control measures such as water bars, broad-based dips, wing ditches, etc. It will not include measures more common to access roads such as gravelling or ditching. Installation will be supervised by a consultant forester, land manager, or other resource professional. Resource concerns include Excessive sediment in surface waters, Sheet & rill erosion, and Concentrated flow erosion

Before Situation:

Access to the tract is not available for occasional travel by the landowner or manager for the purposes of monitoring, installing conservation practices and/or the removal of forest products. Improperly installed trails and landings will cause soil erosio

After Situation:

A trail system is installed that provides access to the forested tract and does not cause excessive erosion or water quality concerns.

Feature Measure: Length of trail treated

Scenario Unit: Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $3,710.45

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 655 - Forest Trails and Landings

Scenario: #3 - Trail Erosion Control w/o Vegetation, Slopes < 35%

Scenario Description:

Rehabilitation of existing forest access trail segments on a 20% slope and a 4% grade by addressing legacy resource issues for long-term use. Typically the trail is a single lane (18-foot wide, including cut and fill), seasonal prism requiring sustained erosion control measures installed by using heavy equipment such as dozers, graders, backhoes, and/or excavators. The purpose is to hydrologically disconnect the existing trail/landing system from streams and natural drainages. This scenario includes designing and installing measures such as cross drains, rock drains, relief drains, out sloping (or changing surface drainage), rolling dips and water bars and ditch outs as needed, and applies to only those segments of the trail system that have resource concerns requiring rehabilitation. Some hand work (chainsaw) will be needed to allow the use of the equipment. Installation will be supervised. Other practices such as Stream Crossing, and Critical Area Planting, Access Road, and Structure for Water Control can be adjacent/appurtenant but not part of this practice scenario. Treatments are for long-term reduction of sediment, restoration of fish habitat, creation of fire access, and the removal of routes off unstable slopes. Resource concerns include: Excessive sedimentation in surface waters, Concentrated flow erosion, Sheet and rill erosion, and Degradation of wildlife species.

Before Situation:

Trails are delivering sediment to waterways, impacting riparian areas and wetlands and possibly affecting T&E species. The system's usefulness for access is also being compromised by inadequate erosion and drainage control systems. However rehabilitation

After Situation:

Trails and landings provide access and do not adversely affect the resources concerns.

Feature Measure: Length of trail treated

Scenario Unit: Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $9,503.19

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.75

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 655 - Forest Trails and Landings

Scenario: #4 - Trail Erosion Control w/o Vegetation, Slopes >35%

Scenario Description:

Rehabilitation of existing forest access trails and landings by addressing legacy resource issues such as sedimentation, for long-term use. Typically the trail is a single lane, existing 18-foot wide including cut and fill seasonal road prism on a moderately steep (45%) slope on forestland requiring sustained erosion control measures applied by using heavy equipment such as dozers, backhoes, graders, excavators, rock and rollers. The purpose is to hydrologically disconnect existing trail/landing system from the streams and natural drainages. This includes the design and installation of cross drains, rock drains, relief drains, out sloping (or changing road surface drainage), rolling dips and water bars and ditch outs as needed This scenario applies to only those segments of the trail system that have resource concerns requiring rehabilitation. A typical water bar or rolling dip installed in this scenario is on a 75 to 100 foot spacing. Some hand work (chainsaw) will be needed to allow the use of the equipment. The work will be supervised. Other practices such as Stream Crossing, and Critical Area Planting, Access Road and Structure for Water Control can be adjacent/appurtenant but not part of this practice scenario . Resource concerns include: Excessive sedimentation in surface waters, Concentrated flow erosion, Sheet and rill erosion, and Degradation of wildlife species.

Before Situation:

Trails are delivering sediment to waterways, impacting riparian/wetlands and/or possibly affecting fish/T&E species. The usefulness of the trail/landing system is being adversely affected by erosion.

After Situation:

Trails and landings provide access and do not adversely affect the resources concerns.

Feature Measure: Length of trail treated

Scenario Unit: Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $8,459.16

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $16.92

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 655 - Forest Trails and Landings

Scenario: #5 - Grading and Shaping with Vegetative Establishment

Scenario Description:

Rehabilitation of existing forest access trails and landings on a medium slope by addressing rutting, erosion, and sedimentation. Typically the trail is a single, existing 18-foot wide (including cut and fill) seasonal road prism on gently sloping terrain requiring sustained erosion control measures applied with heavy equipment such as dozers, graders, backhoes, and/or excavators. The purpose is to hydrologically disconnect the existing trail/landing system from streams and natural drainages and to establish a vegetative cover. This scenario includes designing and installation measures such as cross drains, rock drains, relief drainage, out sloping (or changing surface drainage), rolling dips and water bars and ditch outs as needed, and applies to only those segments of the trail system that have resource concerns requiring rehabilitation. It also includes seedbed preparation, seeding to a perennial improved grass and soil amendments determined to be needed. Some hand work (chainsaw) will be needed to allow the use of the equipment. Other practices such as Stream Crossing, and Critical Area Planting. Access Road and Structure for Water Control can be adjacent/appurtenant but not part of the practice scenario. Treatments are for long-term reduction of sediment, restore fish habitat, create fire access and to move routes off unstable slopes. Resource concerns include: Excessive sediment in surface waters, Concentrated and Sheet & rill flow erosion, Soil compaction, and Habitat degradation.

Before Situation:

Trail/landings are delivering sediment to waterways, impacting riparian/wetlands and/or possibly affecting fish/T&E species. The usefulness of the trail/landing system is being adversely affected by erosion.

After Situation:

A trail system is installed that provides access to the forested tract and does not cause excessive erosion or water quality concerns.

Feature Measure: Length of trail treated

Scenario Unit: Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $7,361.21

Total Cost per Unit: $3.68

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 656 - Constructed Wetland

Scenario: #1 - Small, Less Than 0.1 ac

Scenario Description:

This practice scenario includes the basic earthwork and native and/or organic wetland vegetation needed to create a constructed wetland to treat contaminated agricultural runoff for a small site (i.e. <0.1 ac). All other components, such as water control structures, dikes or upstream sediment basins, must be paid for under facilitating practices. Soil, water and tissue sampling are required. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens. Associated practices: Structure for Water Control (587); Sediment Basin (350); Dike (356); Pond Sealing or Lining, Compacted Clay Treatment (521D); Pond Sealing or Lining, Flexible Membrane (521A); Fence (382); Grade Stabilization Structure (410); Pumping Plant (533); Waste Transfer (634)

Before Situation:

Contaminated agricultural runoff causes excess ponding and/or water quality degradation.

After Situation:

A 2000 sq foot constructed wetland (i.e. 20' x 100') will be constructed with an average 18" depth. Only the earthwork and wetland vegetation are considered in this scenario. Any structures or sediment basins will be designed under a separate practice. The constructed wetland treats the effluent by reducing excess nutrients and adding oxygen through wetland plants and functions before the effluent is transported to a waste storage facility or discharged off site, if permitted by regulation.

Feature Measure: Area of Constructed Wetlan

Scenario Unit: Square Foot

Scenario Typical Size: 2,000.0

Scenario Total Cost: $2,091.33

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.05

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 656 - Constructed Wetland

Scenario: #2 - Medium, 0.1 to 0.5 ac

Scenario Description:

This practice scenario includes the basic earthwork and native and/or organic wetland vegetation needed to create a constructed wetland to treat contaminated agricultural runoff for a medium site (i.e. 0.1 - 0.5 ac). All other components, such as water control structures, dikes or upstream sediment basins, must be paid for under facilitating practices. Soil, water and tissue sampling are required. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens. Associated practices: Structure for Water Control (587); Sediment Basin (350); Dike (356); Pond Sealing or Lining, Compacted Clay Treatment (521D); Pond Sealing or Lining, Flexible Membrane (521A); Fence (382); Grade Stabilization Structure (410); Pumping Plant (533); Waste Transfer (634)

Before Situation:

Contaminated agricultural runoff causes excess ponding and/or water quality degradation.

After Situation:

A 0.25 acre constructed wetland (i.e. 45' x 240') will be constructed with an average 18" depth. Only the earthwork and wetland vegetation are considered in this scenario. Any structures or sediment basins will be designed under a separate practice. The constructed wetland is sited near the property boundary, but still takes cropland out of production (1/2 wetland acreage). The constructed wetland treats the effluent by reducing excess nutrients and adding oxygen through wetland plants and functions before the effluent is transported to a waste storage facility or discharged off site, if permitted by regulation.

Feature Measure: Area of Constructed Wetlan

Scenario Unit: Acre

Scenario Typical Size: 0.3

Scenario Total Cost: $4,815.04

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $19,260.16

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 656 - Constructed Wetland

Scenario: #3 - Large, More Than 0.5 ac

Scenario Description:

This practice scenario includes the basic earthwork and native and/or organic wetland vegetation needed to create a constructed wetland to treat contaminated agricultural runoff for a large site (i.e. >0.5 ac). All other components, such as water control structures, dikes or upstream sediment basins, must be paid for under facilitating practices. Soil, water and tissue sampling are required. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens. Associated practices: Structure for Water Control (587); Sediment Basin (350); Dike (356); Pond Sealing or Lining, Compacted Clay Treatment (521D); Pond Sealing or Lining, Flexible Membrane (521A); Fence (382); Grade Stabilization Structure (410); Pumping Plant (533); Waste Transfer (634)

Before Situation:

Contaminated agricultural runoff causes excess ponding and/or water quality degradation.

After Situation:

A 1 acre constructed wetland (i.e. 95' x 460') will be constructed with an average 18" depth. Only the earthwork and wetland vegetation are considered in this scenario. Any structures or sediment basins will be designed under a separate practice. The constructed wetland is sited near the property boundary, but still takes cropland out of production (1/2 wetland acreage). The constructed wetland treats the effluent by reducing excess nutrients and adding oxygen through wetland plants and functions before the effluent is transported to a waste storage facility or discharged off site, if permitted by regulation.

Feature Measure: Area of Constructed Wetlan

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $12,598.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12,598.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 657 - Wetland Restoration

Scenario: #2 - Riverine Levee Removal and Floodplain Features

Scenario Description:

A Riverine HGM tract on a large floodplain is to be restored. It has been converted to agricultural production by surface ditching and clearing of woody vegetation. The size of the tract is 100 acres. The wetland extent is 60 acres, and 40 acres are adjacent non-wetland. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate structure and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

A levee prevents floodwater from entering the tract. The original cover was forest. The site is drained by surface ditches which collect surface water and direct it to the river through a flap gate structure. The site has been completely cleared, and no s

After Situation:

The hydrology of the site is restored with the installation of ditch plugs, and the excavation of macrotopographic features with an average depth of 6" over 30% of the wetland area. Excavated spoil is placed adjacent to the features on the wetland and adjacent non-wetland area with a maximum depth of 24 inches. The levee has been breached at the upstream and downstream ends of the tract reach, restoring dynamic stream flooding. The breach length is 150 feet long at both locations. Both the wetland and non-wetland areas are planted with a Bottomland Hardwood species mix. The levee breaches are armored with rock riprap. Facilitating practices include Grade Stabilization Structure and Tree and Shrub Planting. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Cubic yds of earth excavatio

Scenario Unit: Cubic Yard

Scenario Typical Size: 16,520.0

Scenario Total Cost: $45,649.22

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.76

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 657 - Wetland Restoration

Scenario: #3 - Depression Sediment Removal and Ditch Plug

Scenario Description:

A Depressional HGM class wetland is to be restored. The tract size is 15 acres, and the actual wetland size is 10 acres. The site is a recharge depression, fed only from surface runoff. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate structure and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The wetland has been converted to agricultural production, and the tract drained with a surface ditch. The ditch is 4' average depth, and 12 feet average width. The wetland receives surface runoff from an adjacent upland watershed, and ponds water on a sh

After Situation:

The ditch has been plugged by the installation of a 50' long section of compacted clay fill, and the deposition has been removed down to the original topsoil layer. A herbaceous plant community has been seeded. Facilitative practices include Conservation Cover. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $22,120.14

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,474.68

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 657 - Wetland Restoration

Scenario: #4 - Estuarine Fringe Levee Removal

Scenario Description:

An Estuarine Fringe HGM landscape is to be restored. The wetland is subject to tidally induced water level fluctuations. The tract size is 120 acres, and the wetland area is 100 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11-WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate structure and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The wetland has been converted to agricultural production by construction of a dike to prevent tidal flows. The dike has a culvert with a flapgate to allow surface water to flow out, but prevents tide water from entering. The dike is 7 feet high above the

After Situation:

The dike has been breached in 4 locations, corresponding to the number of original inlet channels. The breach locations have 8 foot long steel sheet pile Structures for Water Control installed to prevent tidal surges from causing serious erosion on the subsided land surface. The original flap gate culvert has been removed. The dike is 4 feet higher than the weir crests, so the excavations are 4 feet by 8 feet long, with 3:1 side slopes. The culvert has been removed and salvaged by the landowner. Facilitating practices are Structure for Water Control. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acre

Scenario Typical Size: 120.0

Scenario Total Cost: $3,547.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $29.56

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 657 - Wetland Restoration

Scenario: #5 - Riverine Channel and Floodplain Restoration

Scenario Description:

A Riverine HGM landscape on a small stream on a low stream order riparian landscape has been converted to agricultural production. The stream channel has degraded. The reach is 1500 feet in length, and the tract size is 15 acres. The wetland area is 10 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate structure and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

Channel incision has broken the lateral connectivity between the stream and floodplain. The conversion to cropland was accompanied by filling and leveling of backswamp, side channel, and oxbow features which formerly ponded water or exposed the floodplain

After Situation:

The hydrology of the site is restored by the installation of a series of rock check structures to raise the stream water surface profile. Floodplain macrotopographic features replicating the original side channels, oxbows, and backswamps are constructed by excavation. Spoil is placed adjacent to the excavations to replicate natural depositional features. The average depth of the excavated features is 2 feet, and the surface area of the excavations is 25% of the tract size. The eroding stream bank is stabilized with soil bio-engineering features, and fish habitat improvement measures are installed in the channel. The tract is seeded to appropriate hydrophytic and upland vegetation, both woody and herbaceous. Facilitating practices are Streambank and Shoreline protection, Structure for Water Control, Conservation Cover, Tree/Shrub Establishment, and Stream Habitat Improvement and Management. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $9,346.18

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $623.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 657 - Wetland Restoration

Scenario: #6 - Crush Tile/Fill Ditch

Scenario Description:

This scenario involves crushing tile and/or plugging an open ditch to restore hydrology to a wetland. Exploratory ditches or holes are placed to determine locations. A parallel ditch is dug along side of unknown tile to determine depth, size, etc. Tile(s) are removed, crushed or otherwise disabled. Soil material is compacted in the areas of excavation. Vegetation is then established. Associated practices expected to be included are Conservation Cover (327), Mulching (484) and or other vegetative establishment. Typical size is 20 acres.

Before Situation:

An existing crop field was drained in the past either by an open ditch or tile drains or a combination of the two. This practice plugs existing ditch(es) and crushes drain tile so as to restore wetland conditions and restore hydrologic conditions.

After Situation:

Tile drains are strategically crushed and/or ditches are plugged with fill from on-site sources. A herbaceous plant community will be seeded. Facilitative practices include Conservation Cover. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: CY of material excavated

Scenario Unit: Cubic Yard

Scenario Typical Size: 165.0

Scenario Total Cost: $1,411.44

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.55

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 657 - Wetland Restoration

Scenario: #7 - Dike Breach, ditch fill and creation of surface macrofeatures

Scenario Description:

To restore 80 acre area back to a wetland requires three 50' long breaches within an existing 4' H, 8' top width, 1,100' L dike. In addition, 12 ditches are filled (40' L x 4' Wide x 1.25' Deep on average) at the discharge end of existing swales and compacted; Also install macrofeatures on 20 surface acres (0.5 deep) creating interconnected drainage ditches. This work allows for frequent inundation and restores the normal hydraulic regime. Resource Concerns are water quality from excess nutrients in surface and ground waters and pesticides transported to surface and ground waters as well as excessive sediment in surface waters and degraded habitat for waterfowl, fish and wildlife.

Before Situation:

The 80 acre farmed wetland has an existing 1,100'- 4' H, 8' top width dike which prevents frequent inundation of cropland and there are regularly spaced (100') shallow (1.5' Deep) surface drainage ditches. The lateral connectivity between the channel and

After Situation:

Restoration of hydrology and plant community functions are improved for the water quality, soil condition improvement, and habitat for fish and wildlife. The hydrology of the site is restored with the levee breech and ditch plugs and the excavation of macrotopographic features on 20 acres. Excavated spoil is placed adjacent to the features on the wetland and adjacent non-wetland area with a maximum depth of 24 inches. The dike has been breached at the upstream, center and downstream ends, restoring natural stream flooding to the area. The breach length averages 50 feet long per location with three completed. The disturbed areas are planted with hydrophilic vegetation using CAP (342). The levee breaches are protected by bioengineered methods using live stakes, fascines and bare root stock plantings using Streambank and Shoreline Protection (580). Facilitating practices include CAP (342), Streambank and Shoreline Protection (580), Structure for Water Control (587), Channel Bed Stabilization (584), Conservation Cover (327), Tree/Shrub Establishment (612), Wetland Enhancement (659) and Riparian Forest Cover (391) or Riparian Herbaceous Cover (390).

Feature Measure: CY of material excavated

Scenario Unit: Cubic Yard

Scenario Typical Size: 16,666.0

Scenario Total Cost: $43,687.44

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 657 - Wetland Restoration

Scenario: #8 - CY Macro-Features

Scenario Description:

Restore the topographic and/or hydrologic features in the area back to a wetland by re-creating the natural macrofeatures (0.5' over 20 acres) typical of the wetland type, creating shallow pools of water and restoring the natural hydraulic functions. Resource Concerns are water quality from excess nutrients in surface and ground waters and pesticides transported to surface and ground waters, associated with farming of the area, as well as excessive sediment in surface waters and degraded habitat for waterfowl, fish and wildlife.

Before Situation:

The area had been farmed in the past by shaping and grading and removing natural wetland shallow pools. Resource Concerns are water quality from excess nutrients in surface and ground waters and pesticides transported to surface and ground waters as well

After Situation:

Restoration of hydrology and plant community functions are improved for the water quality, soil condition improvement, and habitat for fish and wildlife. The 0.5' D -20 acre wetland area is re-created. Excavated spoil is placed on non-wetland area with a maximum depth of 24 inches. Facilitating practices include CAP (342), Streambank and Shoreline Protection (580), Structure for Water Control (587), Channel Bed Stabilization (584), Conservation Cover (327), Tree/Shrub Establishment (612), Wetland Enhancement (659) and Riparian Forest Cover (391) or Riparian Herbaceous Cover (390).

Feature Measure: CY of excavated material

Scenario Unit: Cubic Yard

Scenario Typical Size: 16,133.0

Scenario Total Cost: $40,666.57

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 657 - Wetland Restoration

Scenario: #9 - Fill shallow drainage ditches, no macro features

Scenario Description:

Restore the area back to a wetland by filling the downstream end and midway section of the 18 shallow ditches that have 4' Width, 2:1S. Fill material for ditch is created from existing 0.5' macrofeature (1.1 surface area). This creates shallow pools of water where the ditch is left in tack thus removing the surface drainage and restoring hydraulic functions. Resource Concerns are water quality from excess nutrients in surface and ground waters and pesticides transported to surface and ground waters, associated with farming of the area, as well as excessive sediment in surface waters and degraded habitat for waterfowl, fish and wildlife.

Before Situation:

The 40 acre farmed wetland has 18 shallow drainage ditches (4' bottom and 1.75' deep) which removes surface water and wetland hydrology allowing the area to be cropped at times. Resource Concerns are water quality from excess nutrients in surface and grou

After Situation:

Restoration of hydrology and plant community functions are improved for the water quality, soil condition improvement, and habitat for fish and wildlife. The farmed wetland has filled 16 surface drainage ditches with 32-40' Long (center and end) of the shallow drainage ditches (16 SF/FT) of ditch section in addition a 1.1 surface area of macrofeatures and swales to connect upslope ditches is created. Some of the property has hydrophilic vegetation and by filling in the ditches, the wetland hydrology of the area will be completely restored. The disturbed areas are planted with hydrophilic vegetation using CAP (342) as needed. The levee breaches are protected by bioengineered methods using live stakes, fascines and bare root stock plantings using Streambank and Shoreline Protection (580). Facilitating practices include CAP (342), Streambank and Shoreline Protection (580), Structure for Water Control (587), Channel Bed Stabilization (584), Conservation Cover (327), Tree/Shrub Establishment (612), Wetland Enhancement (659) and Riparian Forest Cover (391) or Riparian Herbaceous Cover (390).

Feature Measure: CY Macro Feature Creation

Scenario Unit: Cubic Yard

Scenario Typical Size: 887.0

Scenario Total Cost: $6,210.48

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7.00

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 658 - Wetland Creation

Scenario: #1 - Wetland Creation, Wildlife Pond

Scenario Description:

A 10 acre wetland is created on a flat mineral upland at a location where surface runoff may be intercepted and ponded by excavation. Resource concerns are 22 - INDEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The site is in cropland on an upland, non floodplain site (interfluve).

After Situation:

An excavation with an average depth of 12" has created a shallow depression in a broad swale which intercepts surface runoff. The excavated material has been spread on adjacent areas. The INADEQUATE HABITAT FOR FISH AND WILDLIFE resource concern has been addressed with the provision of seasonal open water for terrestrial, aquatic, and waterfowl species. Associated practices may include (484) Mulching, (342) Critical Area Planting, (612) Tree and Shrub Establishment and (644) Wetland Wildlife Habitat Management.

Feature Measure: CY of created area

Scenario Unit: Cubic Yard

Scenario Typical Size: 16,133.0

Scenario Total Cost: $42,540.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.64

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 658 - Wetland Creation

Scenario: #2 - Ephemeral Pools

Scenario Description:

This scenario addresses inadequate habitat for fish and wildlife on all lands suitable for establishment. The resource concern is addressed by providing shallow water habitat for wildlife such as shorebirds, waterfowl, wading birds, mammals, fish, reptiles, amphibians, and other species that require shallow water for at least part of their life cycle. The creation and establishment of a small pool for temporary water during portions of the growing and non-growing season for wildlife that require shallow to moderately deep water for at least part of their life cycle. Typical settings are gentle to rolling terrain in forested settings where initial site prep may need to be performed by clearing an area of trees and brush. The typical area is approximately 2,500 square feet consisting of variable depths up to a maximum depth of depth 3'. Side slopes are 5:1 or flatter and side slopes. Soils are poorly to somewhat poorly drained. Ingress and egress as well as disturbance is typically sewn to an annual cover and mulched with clean straw and allowed to revegetate under natural conditions. Associated practices expected to be included are Critical Area Treatment (342) and Mulching (484).

Before Situation:

Forested or semi-forested areas that have some canopy closure lack suitable amphibian or reptile moisture regimes that these organisms depend on for a portion of their life cycle. Water leaves the site rapidly and is not retained in suitable quantities to

After Situation:

Topography has been altered slightly to pond or inundate a relatively small area. Wildlife such as amphibians or reptiles and water is retained longer on the site providing habitat for at least part of their life cycle. Adjacent cover may be enhanced by supporting practices. The hydrologic conditions of ponding and saturation (frequency, depth, duration, timing) provides optimum seasonal habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.). Depending on local conditions, other Conservation Practices may also be required.

Feature Measure: area of created pool

Scenario Unit: Square Foot

Scenario Typical Size: 2,500.0

Scenario Total Cost: $2,064.94

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.83

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 658 - Wetland Creation

Scenario: #3 - Shallow Water Areas

Scenario Description:

This scenario addresses inadequate habitat for fish and wildlife on all suitable lands. The resource concern is addressed by providing shallow water habitat for wildlife such as shorebirds, waterfowl, wading birds, mammals, fish, reptiles, amphibians, and other species that require shallow water for at least part of their life cycle. The creation and establishment of a small pool for temporary to semi-permanent water during portions of the growing and non-growing season for wildlife that require shallow to moderately deep water for at least part of their life cycle. Typical settings are gentle to rolling terrain in agricultural settings. The typical size is 0.5 acres consisting of variable depths up to a maximum depth of depth 3'. Side slopes are 6:1 or flatter. Soils are somewhat poorly to moderately well drained. Ingress and egress as well as disturbance is typically sewn to an annual cover and mulched with clean straw and allowed to revegetate under natural conditions. Water is either ponded or managed by installation of a water control structure through a 3.0' berm, 8' top width, 4:1 SS min, 200 Lin. ft. low berm (444 CY), using on-site material (not included). Soils have low permeability or moderately well to poorly drained. Associated practices expected to be included are Critical Area Treatment (342) and Mulching (484) and (587) Structure for Water Control.

Before Situation:

Wildlife have access to moderately shallow water during the year. Water is typically not managed through regular manipulation; or managed and ponded behind a dike where a 18" dia. flashboard riser with a 12" CMP under 3.0' berm, 8' top width, 6:1 SS, 250

After Situation:

Topography has been altered slightly to pond or inundate a relatively small area. Wildlife such as amphibians or reptiles and water is retained longer on the site providing habitat for at least part of their life cycle. Adjacent cover may be enhanced by supporting practices. The hydrologic conditions of ponding and saturation (frequency, depth, duration, timing) provides optimum seasonal habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.). Depending on local conditions, other Conservation Practices may also be required.

Feature Measure: area of created pool

Scenario Unit: Acre

Scenario Typical Size: 0.5

Scenario Total Cost: $2,905.98

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,811.97

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 659 - Wetland Enhancement

Scenario: #3 - Riverine Levee Removal and Floodplain Features

Scenario Description:

A Riverine HGM tract on a large floodplain is to be enhanced. It has been converted to agricultural production by surface ditching and clearing of woody vegetation. The size of the tract is 100 acres. The wetland extent is 60 acres, and 40 acres are adjacent non-wetland. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate structure and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

A levee prevents floodwater from entering the tract. The original cover was forest. The site is drained by surface ditches which collect surface water and direct it to the river through a flap gate structure. The site has been completely cleared, and no s

After Situation:

The hydrology of the site is enhanced with the installation of ditch plugs, and the excavation of macrotopographic features with an average depth of 6" over 30% of the wetland area. Excavated spoil is placed adjacent to the features on the wetland and adjacent non-wetland area with a maximum depth of 24 inches. The levee has been breached at the upstream and downstream ends of the tract reach, restoring dynamic stream flooding. The breach length is 150 feet long at both locations. Both the wetland and non-wetland areas are planted with a Bottomland Hardwood species mix. The levee breaches are armored with rock riprap. Facilitating practices include Grade Stabilization Structure and Tree and Shrub Planting. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Cubic yds of earth excavatio

Scenario Unit: Cubic Yard

Scenario Typical Size: 16,520.0

Scenario Total Cost: $45,649.22

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.76

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 659 - Wetland Enhancement

Scenario: #4 - Depression Sediment Removal and Ditch Plug

Scenario Description:

A Depressional HGM class wetland is to be enhanced. The tract size is 15 acres, and the actual wetland size is 10 acres. The site is a recharge depression, fed only from surface runoff. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate structure and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The wetland has been converted to agricultural production, and the tract drained with a surface ditch. The ditch is 4' average depth, and 12 feet average width. The wetland receives surface runoff from an adjacent upland watershed, and ponds water on a sh

After Situation:

The ditch has been plugged by the installation of a 50' long section of compacted clay fill, and the deposition has been removed down to the original topsoil layer. A herbaceous plant community has been seeded. Facilitative practices include Conservation Cover. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Cubic yds of earth excavatio

Scenario Unit: Cubic Yard

Scenario Typical Size: 8,067.0

Scenario Total Cost: $22,120.14

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 659 - Wetland Enhancement

Scenario: #5 - Estuarine Fringe Levee Removal

Scenario Description:

An Estuarine Fringe HGM landscape is to be enhanced. The wetland is subject to tidally induced water level fluctuations. The tract size is 120 acres, and the wetland area is 100 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11-WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate structure and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The wetland has been converted to agricultural production by construction of a dike to prevent tidal flows. The dike has a culvert with a flapgate to allow surface water to flow out, but prevents tide water from entering. The dike is 7 feet high above the

After Situation:

The dike has been breached in 4 locations, corresponding to the number of original inlet channels. The breach locations have 8 foot long steel sheet pile Structures for Water Control installed to prevent tidal surges from causing serious erosion on the subsided land surface. The original flap gate culvert has been removed. The dike is 4 feet higher than the weir crests, so the excavations are 4 feet by 8 feet long, with 3:1 side slopes. The culvert has been removed and salvaged by the landowner. Facilitating practices are Structure for Water Control. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acre

Scenario Typical Size: 120.0

Scenario Total Cost: $3,547.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $29.56

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 659 - Wetland Enhancement

Scenario: #6 - Riverine Channel and Floodplain Restoration

Scenario Description:

A Riverine HGM landscape on a small stream on a low stream order riparian landscape has been converted to agricultural production. The stream channel has degraded. The reach is 1500 feet in length, and the tract size is 15 acres. The wetland area is 10 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate structure and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

Channel incision has broken the lateral connectivity between the stream and floodplain. The conversion to cropland was accompanied by filling and leveling of backswamp, side channel, and oxbow features which formerly ponded water or exposed the floodplain

After Situation:

The hydrology of the site is restored by the installation of a series of rock check structures to raise the stream water surface profile. Floodplain macrotopographic features replicating the original side channels, oxbows, and backswamps are constructed by excavation. Spoil is placed adjacent to the excavations to replicate natural depositional features. The average depth of the excavated features is 2 feet, and the surface area of the excavations is 25% of the tract size. The eroding stream bank is stabilized with soil bio-engineering features, and fish habitat improvement measures are installed in the channel. The tract is seeded to appropriate hydrophytic and upland vegetation, both woody and herbaceous. Facilitating practices are Streambank and Shoreline protection, Structure for Water Control, Conservation Cover, Tree/Shrub Establishment, and Stream Habitat Improvement and Management. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $9,346.18

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $623.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 660 - Tree-Shrub Pruning

Scenario: #23 - Pruning Individual Agroforestry tree - small acreage

Scenario Description:

In agroforestry settings (crop or forest lands) overstory tree crowns are pruned to increase sunlight to understory shrubs, low growing trees, and crop plants that have been purposely established to grow on the same ground. Thirty trees or less per acre require pruning. Associated Conservation Practice Standard (CPS) 384 - Woody Residue Treatment. Resource concern is degraded plant condition - undesirable plant productivity and health.

Before Situation:

Overstory trees are expanding their crowns, providing too much shade on the understory plants. The shade is affecting the growth and production of the understory plants. Pruning branches, leaves, frawns, etc. are needed to maintain the desired about of su

After Situation:

Pruning of the overstory tree crowns is completed, allowing the proper amount of sunlight to reach the understory vegetation, maintaining their grown, health and vigor, and wildlife benefits. Typical treatment area is less than 1 acre; typical scenario based on 1 ac, 30 TPA.

Feature Measure: Tree Pruned

Scenario Unit: Each

Scenario Typical Size: 30.0

Scenario Total Cost: $394.91

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13.16

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 666 - Forest Stand Improvement

Scenario: #1 - Pre-commercial Thinning - Hand tools

Scenario Description:

Adjusting the stocking of a young, non-merchantable stand of trees. The operation is supervised by a consultant forester who marks the trees to be cut and is carried out using hand tools such as chainsaws. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

The stocking of a stand of trees that are too small to make a commercial thinning exceeds the recommended fully stocked level for the species and site. The effect is much slower growth than is reasonable or expected for the site, increased susceptibility

After Situation:

After adjusting the stocking to an acceptable level, stand growth, condition, and overall quality is improved. In addition, wildlife habitat is improved with the resulting increase of sunlight reaching the forest floor.

Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $5,599.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $559.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 666 - Forest Stand Improvement

Scenario: #2 - Timber Stand Improvement - Single Stem Treatment

Scenario Description:

Altering the composition and stocking of a stand of trees by means of individual stem treatment. The trees to be retained are marked by a consultant forester. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

The existing condition of the stand cannot meet the landowners objectives because the composition consists of unwanted species and the stocking exceeds the recommended level. The species and quality of the trees to be controlled makes a commercial operati

After Situation:

The composition of the stand can meet the landowners objectives and the growth, condition and quality of the remaining trees is improved.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $3,300.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $330.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 666 - Forest Stand Improvement

Scenario: #3 - Timber Stand Improvement - Chemical, Ground

Scenario Description:
Using ground applied chemicals to release young desirable trees from competing and/or overtopping vegetation. Resource concerns include: Undesirable plant productivity and health, and Wildlife habitat degradation.

Before Situation:
An adequately stocked stand of desirable species and trees is not growing to its potential for the site due to severe competition from undesirable trees and brush. Releasing the desirable trees from the competition will be achieved through the application

After Situation:
The released stand of trees contains the composition and quality needed to meet the landowner's objectives and address the resource concerns.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $6,768.81

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $169.22

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 666 - Forest Stand Improvement

Scenario: #4 - Timber Stand Improvement - Chemical, Aerial

Scenario Description:
Using aerially applied chemicals to release desirable trees from competing and/or overtopping vegetation. Resource concerns include: Undesirable plant productivity and health, and Wildlife habitat degradation.

Before Situation:
An adequately stocked stand of desirable species and trees is not growing to its potential for the site due to severe competition from undesirable trees and brush. Releasing the desirable trees from the competition will be achieved through the application

After Situation:
The released stand of trees contains the composition and quality needed to meet the landowner's objectives and address the resource concerns.

Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $3,877.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $96.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 666 - Forest Stand Improvement

Scenario: #5 - Competition Control - Mechanical, Light Equipment

Scenario Description:

Using light equipment such as a tractor with brush hog to control vegetation that is competing with desirable trees and species or to reduce the stocking level of a stand of desirable trees. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

A stand of young, desirable trees is adversely affected by competition either from undesirable species or because the stand is overstocked. The vegetation to be controlled is small enough that it can be mowed or shredded. The work can be done by mowing or

After Situation:

After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, stand growth, condition, and overall quality is improved. In addition, wildlife habitat is improved with the resulting increase of sunlight reaching the forest floor.

Feature Measure: Area Treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $612.57

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $61.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 666 - Forest Stand Improvement

Scenario: #6 - Competition Control - Mechanical, Heavy Equipment

Scenario Description:

Using equipment such as a masticator or mulcher to control vegetation that is competing with desirable trees and species or to reduce the stocking level of a stand of desirable trees. The trees to be retained will be marked by a consultant. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

A stand of desirable trees is adversely affected by competition either from undesirable species, cull trees, or because the stand is overstocked. The vegetation to be controlled is too large to be mowed or shredded. Therefore other mechanical methods such

After Situation:

The released stand of trees contains the composition and quality needed to meet the landowner's objectives and address the resource concerns.

Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $7,229.50

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $722.95

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 666 - Forest Stand Improvement

Scenario: #7 - Creating Patch Clearcuts

Scenario Description:

Creating 2 acre patches in over-mature and/or degraded stands using hand tools such as chainsaws. Resource concerns include: Undesirable plant productivity and health, Inadequate structure and composition, and habitat degradation.

Before Situation:

The existing stand is overly mature and/or has been degraded in value by past harvesting practices. The level of acceptable growing stock is too low to justify managing this stand in its present condition. The present form, species composition and structu

After Situation:

A new, young stand of desirable species is established In addition, early successional wildlife habitat as well as forest type diversity are created.

Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $1,404.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $702.43

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 666 - Forest Stand Improvement

Scenario: #8 - Forest Thinning for Wildlife and Health

Scenario Description:

A combination of hand and chemical treatments used to open the canopy of a stand to improve the wildlife habitat and tree health. Resource concerns include: Inadequate structure and composition, Undesirable plant productivity and health, and Habitat degradation.

Before Situation:

The stand of mature trees is overstocked resulting in a closed canopy. This condition is causing a lack of structure, herbaceous layer, and diversity that is needed to meet the landowner's objectives for improved wildlife habitat and forest health. Under

After Situation:

The stand is treated to favor diversity of important commercial and wildlife species. The canopy is opened to the extent necessary to promote herbaceous growth and the work is performed without excessive damage to the residual trees and site.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $4,094.41

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $409.44

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 666 - Forest Stand Improvement

Scenario: #41 - Timber Stand Improvement - Chemical, Hand treatment, no specialist required

Scenario Description:

Using hand applied chemicals to release young desirable trees from competing and/or overtopping vegetation. Resource concerns include: Undesirable plant productivity and health, and Wildlife habitat degradation.

Before Situation:

An adequately stocked stand of desirable species and trees is not growing to its potential for the site due to severe competition from undesirable trees and brush. Releasing the desirable trees from the competition will be achieved through the application

After Situation:

The released stand of trees contains the composition and quality needed to meet the landowner's objectives and address the resource concerns.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $5,295.71

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $132.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 666 - Forest Stand Improvement

Scenario: #42 - Use of Consulting Forester to Oversee Commercial Timber Harvest to Create Warbler Habitat

Scenario Description:

A consultant forester oversees a commercial timber harvest on privately owned lands taking into consideration the wildlife habitat goals and objectives of the client. The primary resource concerns are inadequate wildlife habitat and stand structure and composition to support desired cerulean warbler and/or golden-winged warbler populations. Silvicultural practices that will result in the desired future forest stand condition are used. Trees to be harvested are marked. The consultant forester oversees the harvesting of the trees including, but not limited to monitoring trees harvested, residual stand damage, and reclamation. Typical harvest size is 50 acres.

Before Situation:

The landowner sells timber to untrained individuals who have little or no knowledge of silviculture or wildlife habitat requirements. The wildlife habitat, stand structure and composition goals of the landowner are not considered resulting in inadequate w

After Situation:

A trained consultant forester evaluates and marks the stand taking into consideration the client wildlife goals/objectives and accepted silvicultural techniques. Established guidelines for Cerulean Warbler and/or Golden-winged warbler habitat are followed. Trees to be harvested are marked and harvested according to Best Management Practices resulting in increased wildlife habitat, desired stand structure and composition, improved plant productivity, health and vigor.

Feature Measure: Acres Harvested

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $10,393.76

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $207.88

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 666 - Forest Stand Improvement

Scenario: #46 - Pre-Commercial FSI - Hand Tools - No Specialist Required

Scenario Description:

Adjusting the stocking of a young, non-merchantable stand of trees. The operation is supervised by a State Division of Forestry Forester at no cost to the landowner and is carried out using hand tools such as chainsaws. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

The stocking of a stand of trees that are too small to make a commercial thinning exceeds the recommended fully stocked level for the species and site. The effect is much slower growth than is reasonable or expected for the site, increased susceptibility

After Situation:

After adjusting the stocking to an acceptable level, stand growth, condition, and overall quality is improved. In addition, wildlife habitat is improved with the resulting increase of sunlight reaching the forest floor.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $4,052.70

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $405.27

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 666 - Forest Stand Improvement

Scenario: #54 - Pre-commercial FSI - Combination Hand Tools and Herbicide - No Specialist Required

Scenario Description:

Adjusting the stocking of a young, non-merchantable stand of trees. The operation is supervised by a State Division of Forestry Forester at no cost to the landowner and is carried out using a combination hand tools, such as a chainsaw, to fell some trees and herbicide to deaden other stems. Resource concerns include undesirable plant productivity and health, wildlife habitat degradation, wildfire hazard, inadequate structure and composition. Assume 5 acres of the 10 acre site will be treated with a chainsaw and 5 acres of the 10 acre site will be treated with herbicide (single stem application).

Before Situation:

The stocking of the stand of trees that are too small to make a commercial operation exceeds the fully stocked level for the species and site. The effect is much slower growth than is reasonable or expected for the site, increases susceptibility to insect

After Situation:

After adjusting the stocking level to an acceptable level, stand growth, condition and overall quality are improved. In addition, wildlife habitat is improved with the resulting increased sunlight reaching the forest floor.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $3,474.36

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $347.44

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 666 - Forest Stand Improvement

Scenario: #94 - Shelterwood Cut

Scenario Description:

The purpose of this treatment is to increase understory light levels so that small advanced reproduction (already present) can grow and will be large enough to compete effectively following overstory removal. This treatment will prepare the stand for an eventual overstory removal. All undesirable understory and midstory vegetation should be cut. Reduce relative density to 40-60%, depending on the size of the advanced reproduction and desired species (density reduction at the discretion of forester). Removals should be focused on seed source trees of undesirable species, all suppressed and intermediate trees, and some co-dominant trees. Retain trees with large, healthy crowns to produce seed and to moderate the ground-level environment. Associated Practices: Restoration and Management of Declining and Rare Habitat(643), Upland Wildlife Habitat Management (645), Herbaceous Weed Control (315), Brush Management (314).

Before Situation:

Adequate numbers of established advanced reproduction are present, but midstory and overstory shade is limiting its development. Either desirable reproduction is too small, or the likelihood of competition is too great to allow for a final (overstory) rem

After Situation:

Minimum of 10 ac. is treated. Understory light levels are enhanced to promote growth of advanced reproduction to competitive sizes.

Feature Measure: Size of treated area

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $7,333.88

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $733.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #40 - LED (using existing fixture) < 20 watts

Scenario Description:

The application of this practice consists of the replacement of an incandescent or compact fluorescent light or tube with a new light emitting diode (LED) lamp or tube on a one-for-one basis where the existing fixture and wiring is functioning. The retrofitted lighting system will provide similar light levels as the existing system. Existing lamp is properly disposed according to its contents and applicable environmental laws and regulations. The typical bulb installed is a 9-watt LED.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, or similar lamps. Inefficient energy use and a recommendation to implement an improvement has been id

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Number of lamps replaced

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $12.92

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12.92

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #56 - LED (using existing fixture) >= 20 watts and < 100 watts

Scenario Description:

The application of this practice consists of the replacement of an incandescent, compact fluorescent, high-pressure sodium (HPS), or similar lamp or tube with new light emitting diode (LED) flood lamp on a one-for-one basis where the existing fixture and wiring is functioning. The retrofitted lighting system will provide similar light levels as the existing system. Existing lamp is properly disposed according to its contents and applicable environmental laws and regulations. The typical flood lamp installed is a 50-watt LED.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, or similar lamps. Inefficient energy use and a recommendation to implement an improvement has been id

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Number of lamps replaced

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $47.86 *Based on Tennessee average costs. Individual county costs may vary.*

Total Cost per Unit: $47.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #72 - LED (using existing fixture) >= 100 watts

Scenario Description:

The application of this practice consists of the replacement of an incandescent, compact fluorescent, mercury vapor, or similar lamp or tube with new light emitting diode (LED) flood lamp or tube on a one-for-one basis where the existing fixture and wiring is functioning. The retrofitted lighting system will provide similar light levels as the existing system. Existing lamp is properly disposed according to its contents and applicable environmental laws and regulations. The typical flood lamp installed is a 150-watt high bay.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, high pressure sodium, mercury vapor, metal halide, halogen, T12 fluorescent tubes driven by magnetic

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Number of lamps replaced

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $115.55

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $115.55

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #88 - Fixture (including LED) < 20 watts

Scenario Description:

The application of this practice consists of the replacement of an existing lamp and fixture with a new light emitting diode (LED) fixture on a one-for-one basis where the existing fixture and wiring is functioning. The retrofitted lighting system will provide similar light levels as the existing system. Existing lamp, fixture, and ballast are properly disposed according to their contents and applicable environmental laws and regulations. The fixture is for indoor or exterior locations and generally known as general, flood, linear, canopy, pendant, wall pack, low intensity flood, ceiling mounted, or low bay. Low bay lighting is used when ceilings are 20 feet or less in height. Low bay fixtures usually have a diffuser mounted to the bottom of the fixture that serves to spread light over a large area. The typical fixture installed is a 9-watt fixture with diodes or lamp.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, high pressure sodium, mercury vapor, metal halide, halogen, T12 fluorescent tubes driven by magnetic

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Number of fixtures replaced

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $24.98

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $24.98

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #104 - Fixture (including LED) >= 20 watts and < 40 watts

Scenario Description:

The application of this practice consists of the replacement of an existing lamp and fixture with a new light emitting diode (LED) fixture on a one-for-one basis where the existing fixture and wiring is functioning. The retrofitted lighting system will provide similar light levels as the existing system. Existing lamp, fixture, and ballast are properly disposed according to their contents and applicable environmental laws and regulations. The fixture is for indoor or exterior locations and generally known as general, flood, linear, canopy, pendant, wall pack, low intensity flood, ceiling mounted, or low bay. Low bay lighting is used when ceilings are 20 feet or less in height. Low bay fixtures usually have a diffuser mounted to the bottom of the fixture that serves to spread light over a large area. The typical fixture installed is a 25-watt fixture with diodes or lamp.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, high pressure sodium, mercury vapor, metal halide, halogen, T12 fluorescent tubes driven by magnetic

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Number of fixtures replaced

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $70.31

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $70.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #120 - Fixture (including LED) >= 40 watts and < 80 watts

Scenario Description:

The application of this practice consists of the replacement of an existing lamp and fixture with a new light emitting diode (LED) fixture on a one-for-one basis where the existing fixture and wiring is functioning. The retrofitted lighting system will provide similar light levels as the existing system. Existing lamp, fixture, and ballast are properly disposed according to their contents and applicable environmental laws and regulations. The fixture is for indoor or exterior locations and generally known as general, flood, linear, canopy, pendant, wall pack, low intensity flood, ceiling mounted, or low bay. Low bay lighting is used when ceilings are 20 feet or less in height. Low bay fixtures usually have a diffuser mounted to the bottom of the fixture that serves to spread light over a large area. The typical fixture installed is a 50-watt fixture with diodes or lamp.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, high pressure sodium, mercury vapor, metal halide, halogen, T12 fluorescent tubes driven by magnetic

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Number of fixtures replaced

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $140.62

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $140.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #136 - Fixture (including LED) >= 80 watts

Scenario Description:

The application of this practice consists of the replacement of existing lamps and fixture with a new light emitting diode (LED) fixture on a one-for-one basis where the existing fixture and wiring is functioning. The retrofitted lighting system will provide similar light levels as the existing system. Existing lamp, fixture, and ballast is properly disposed according to its contents and applicable environmental laws and regulations. The fixture is for indoor or exterior locations and generally known as high bay or high intensity flood light or linear. High bay lighting is used when ceilings are 20 - 45 feet in height and where fixtures are mounted at the ceiling height instead of being suspended down to a lower level. High bay fixtures usually have an aluminum or mirror-like reflector which directs light downwards to the floor area or a prismatic reflector to spread light over larger areas. The typical fixture installed is a 200-watt round high bay or 160-watt linear fixture.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, high pressure sodium, mercury vapor, metal halide, halogen, T12 fluorescent tubes driven by magnetic

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Number of fixtures replaced

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $259.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $259.27

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #152 - Poultry house, Lamp replacement

Scenario Description:

The application of this practice consists of the replacement of incandescent or compact fluorescent lights with new light emitting diode (LED) lamps on a one-for-one basis where the existing fixtures and wiring are functioning. The retrofitted lighting system with a new dimmer will provide similar light level as the existing system. Existing lamps are properly disposed according to their contents and applicable environmental laws and regulations. The quantity for the scenario is based upon the nominal floor area, in square feet, of the poultry house. The typical system installed is in a 40x500-foot poultry house with 99 existing incandescent light bulbs that are removed and replaced with 99 9-watt LED grow out bulbs, and the typical size is 20,000 square feet.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, or similar lamps. Inefficient energy use and a recommendation to implement an improvement has been id

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Nominal area of building

Scenario Unit: Square Foot

Scenario Typical Size: 20,000.0

Scenario Total Cost: $1,665.82

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #168 - Poultry house, Fixture (including LED) replacement

Scenario Description:

The application of this practice consists of the replacement of existing lamps and fixtures with new light emitting diode (LED) fixtures on a one-for-one basis where the existing fixtures and wiring are functioning. The retrofitted lighting system with a new dimmer will provide similar light levels as the existing system. Existing lamps, fixtures, and ballasts are properly disposed according to their contents and applicable environmental laws and regulations. The quantity for the scenario is based upon the nominal floor area, in square feet, of the poultry house. The typical system installed is in a 40x500 foot poultry house with 99 existing incandescent light fixture and bulbs that are removed and replaced with 99 9-watt LED fixtures with diodes or new fixtures with LED grow out bulbs, and the typical size is 20,000 square feet.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, or similar lamps. Inefficient energy use and a recommendation to implement an improvement has been id

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Nominal area of building

Scenario Unit: Square Foot

Scenario Typical Size: 20,000.0

Scenario Total Cost: $2,932.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.15

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #184 - Poultry house, Fixture (including LED) replacement with new layout

Scenario Description:

The application of this practice consists of the replacement of existing lamps and fixtures with new light emitting diode (LED) fixtures and wiring in a new layout. The replacement lighting system with a new dimmer will provide similar light levels as the existing system. Existing lamps, fixtures, and ballasts are properly disposed according to their contents and applicable environmental laws and regulations. The quantity for the scenario is based upon the nominal floor area, in square feet, of the poultry house. The typical system installed is in a 40x500 ft. poultry house with 21 150W sodium or halide fixtures and bulbs that are removed and replaced with 100 9-watt LED fixtures with diodes or new fixtures with LED grow out bulbs in a new layout, and the typical size is 20,000 square feet.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, or similar lamps. Inefficient energy use and a recommendation to implement an improvement has been id

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Nominal area of building

Scenario Unit: Square Foot

Scenario Typical Size: 20,000.0

Scenario Total Cost: $4,045.76

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.20

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #200 - Swine facility, Fixture (including LED) replacement

Scenario Description:

The application of this practice consists of the replacement of existing lamps and fixtures with new light emitting diode (LED) fixtures on a one-for-one basis where the existing fixtures and wiring are functioning. The areas of installation may include any combination of gestation, nursery, farrowing and finishing facilities. The retrofitted lighting system with a new dimmer will provide similar light levels as the existing system. Existing lamps, fixtures, and ballasts are properly disposed according to their contents and applicable environmental laws and regulations. The quantity for the scenario is based upon the nominal floor area, in square feet, of the lighted area. The typical system installed is in a 60x500 ft. swine facility with 115 existing incandescent light fixture and bulbs that are removed and replaced with 115 25-watt LED fixtures with diodes and the typical size is 30,000 square feet.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, high pressure sodium, mercury vapor, metal halide, halogen, T12 fluorescent tubes driven by magnetic

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Nominal lighted area

Scenario Unit: Square Foot

Scenario Typical Size: 30,000.0

Scenario Total Cost: $7,598.72

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.25

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #216 - Dairy housing, Fixture (including LED) replacement

Scenario Description:

The application of this practice consists of the replacement of existing lamps and fixtures with new light emitting diode (LED) fixtures on a one-for-one basis where the existing fixtures and wiring are functioning. The areas of installation may include any combination of free stalls and dairy housing, and other areas where high bay fixtures are appropriate such as milking parlors, washrooms, and other interior spaces. The retrofitted lighting system will provide similar light levels as the existing system. Existing lamps, fixtures, and ballasts are properly disposed according to their contents and applicable environmental laws and regulations. The quantity for the scenario is based upon the nominal floor area, in square feet, of the lighted area. The typical system installed is in a 105x230 ft. free stall barn with 30 existing mercury vapor lights that are removed and replaced with 30 180-watt high bay fixtures with diodes and the typical size is 24,150 square feet.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, high pressure sodium, mercury vapor, metal halide, halogen, T12 fluorescent tubes driven by magnetic

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Nominal lighted area

Scenario Unit: Square Foot

Scenario Typical Size: 24,150.0

Scenario Total Cost: $9,055.82

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.37

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #232 - General agricultural area, Fixture (including LED) replacement

Scenario Description:

The application of this practice consists of the replacement of existing lamps and fixtures with multiple, new light emitting diode (LED) fixtures and wiring in a new layout. The replacement lighting system will provide similar light levels as the existing system. Existing lamps, fixtures, and ballasts are properly disposed according to their contents and applicable environmental laws and regulations. The quantity for the scenario is based upon the nominal floor area, in square feet, of the lighted area. The typical system installed is in a 25x65 ft. agricultural building with 20 high pressure sodium light fixtures that are removed and replaced with 25 12-watt LED fixtures with diodes, and the typical size of 1,625 square feet.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, high pressure sodium, mercury vapor, metal halide, halogen, T12 fluorescent tubes driven by magnetic

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Nominal lighted area

Scenario Unit: Square Foot

Scenario Typical Size: 1,625.0

Scenario Total Cost: $1,110.25

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.68

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #248 - Specialty agricultural area, waterproof, Fixture (including LED) replacement

Scenario Description:

The application of this practice consists of the replacement of existing lamps and fixtures with new vapor-tight and waterproof light emitting diode (LED) fixtures where the existing fixtures and wiring are functioning. The replaced lighting system will provide similar light levels as the existing system. Existing lamps, fixtures, and ballasts are properly disposed according to their contents and applicable environmental laws and regulations. The quantity for the scenario is based upon the nominal floor area, in square feet, of the lighted area. The typical system installed is in a 43x43 ft. dairy parlor where existing fixtures are removed and replaced with 4 linear, waterproof, LED T8 fixtures with four tubes and the typical size of 1,849 square feet.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, high pressure sodium, mercury vapor, metal halide, halogen, T12 fluorescent tubes driven by magnetic

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Nominal lighted area

Scenario Unit: Square Foot

Scenario Typical Size: 1,849.0

Scenario Total Cost: $1,967.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #264 - LED Dimmer or Controller

Scenario Description:

The typical application of this practice consists of the replacement of an existing dimmer or controller where the existing or retrofitted lighting system and wiring is functioning. The dimmer or controller shall be rated to operate with the retrofitted lighting system and includes all wiring, switches and controls. The existing dimmers and controls are properly disposed according to its contents and applicable environmental laws and regulations.

Before Situation:

A replaced or retrofitted lighting system within an agricultural operation has none or an obsolete dimmer or controller. Inefficient energy use and a recommendation to implement an improvement has been identified by an ASABE S612 compliant on-farm energy

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Number of dimmers installe

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $487.43

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $487.43

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 670 - Energy Efficient Lighting System

Scenario: #280 - Poultry breeding, Fixture (including LED) replacement with new layout

Scenario Description:

The application of this practice consists of the replacement of existing lamps and fixtures with new light emitting diode (LED) fixtures and wiring in a new layout. The replacement lighting system with a new dimmer will provide similar light levels as the existing system. Existing lamps, fixtures, and ballasts are properly disposed according to their contents and applicable environmental laws and regulations. The quantity for the scenario is based upon the nominal floor area, in square feet, of the poultry house. The typical system installed is in a 40’ x 500’ poultry breeder house with 21 150W sodium or halide fixtures and bulbs that are removed and replaced with 135 10-watt LED fixtures with diodes or new fixtures with LED grow out bulbs in a new layout, and the contract item number quantity is 20,000.

Before Situation:

A lighting system uses energy inefficiently within an agricultural operation. The existing lighting system consists of incandescent, compact fluorescent, or similar lamps. Inefficient energy use and a recommendation to implement an improvement has been id

After Situation:

A replaced or retrofitted lighting system is installed in an agricultural operation that has a minimum rated efficacy of 90 lumens per watt, can withstand the environmental conditions, is designed for light levels suitable for the area and is expressed as lumens. An analysis of the estimated annual energy savings is completed. The replaced or retrofitted lighting system will reduce overall power requirements (kW) compared to the existing lighting system. Associated activities: CEMA 228 Agricultural Energy Assessment , DIA 120 Agricultural Energy Design.

Feature Measure: Nominal area of building

Scenario Unit: Square Foot

Scenario Typical Size: 20,000.0

Scenario Total Cost: $6,114.14

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 672 - Energy Efficient Building Envelope

Scenario: #1 - Attic Insulation, Blown-In

Scenario Description:

Install a minimum R-7 insulation in addition to existing attic or ceiling to reduce heat transfer. Increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate. Typical scenario assumes 2" of cellulose insulation will be added to the attic with typical dimensions 40'x500', thus yielding 3333 cubic feet.

Before Situation:

An agricultural facility with an inefficient building envelope with limited wall insulation.

After Situation:

A more effective and efficient building envelope can be created through addition of, or increased, attic insulation. Associated practices/activities: 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Cubic Feet of Attic Insulated

Scenario Unit: Cubic Foot

Scenario Typical Size: 3,333.0

Scenario Total Cost: $2,908.10

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.87

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 672 - Energy Efficient Building Envelope

Scenario: #2 - Building Envelope - Wall Insulation, Spray Foam

Scenario Description:

Enclose both sidewalls and endwalls from ceiling to floor in one of two manners: 1) metal exterior, 3.5" fiberglass batts (R-11), vapor barrier, & interior plywood or OSB sheathing, or 2) closed-cell polyurethane foam application (minimum 1" thickness (R-7) of 2.5 lbs./cu.ft. or higher density, (3.0 or higher density preferred) with a form of physical protective barrier on lower 2' (may be 6 lbs./cu.ft. or higher density 1/8" thick foam, or treated lumber). Based on a 40' x 400' poultry house.

Before Situation:

An agricultural facility with an inefficient building envelope with limited wall insulation.

After Situation:

A more effective and efficient building envelope can be created through addition of, or increased, insulation. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Area of Wall Insulated

Scenario Unit: Square Foot

Scenario Typical Size: 5,770.0

Scenario Total Cost: $16,479.93

Total Cost per Unit: $2.86

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 672 - Energy Efficient Building Envelope

Scenario: #3 - Building Envelope - Wall Insulation, Batts

Scenario Description:

Enclose both sidewalls and endwalls from ceiling to floor in one of two manners: 1) metal exterior, 3.5" fiberglass batts (R-11), vapor barrier, & interior plywood or OSB sheathing, or 2) closed-cell polyurethane foam application (minimum 1" thickness (R-7) of 2.5 lbs./cu.ft. or higher density, (3.0 or higher density preferred) with a form of physical protective barrier on lower 2' (may be 6 lbs./cu.ft. or higher density 1/8" thick foam, or treated lumber). Based on a 40' x 400' poultry house.

Before Situation:

An agricultural facility with an inefficient building envelope with limited wall insulation.

After Situation:

A more effective and efficient building envelope can be created through addition of, or increased, insulation. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Area of Wall Insulated

Scenario Unit: Square Foot

Scenario Typical Size: 5,770.0

Scenario Total Cost: $13,363.53

Total Cost per Unit: $2.32

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 672 - Energy Efficient Building Envelope

Scenario: #5 - Building Envelope - thermal blankets, insulated curtains and screens for greenhouses

Scenario Description:

The mechanical energy screen system consists of a drive motor, support cables, controls, and shade material, which may be woven, knitted, or non-woven strips of aluminum fiber, polyethylene, nylon or other synthetic material. The screen provides a means to better control solar heat gain and heat transfer during night or cold weather conditions to reduce energy use. Screens and similar devices may also be used to divide internal areas and allow for differentiated heating, ventilation, or cooling system operation to reduce energy use.

Before Situation:

Heating and cooling of an existing greenhouse, or similar structure with conditioned spaces, is inefficient due to poorly regulated heat transfer. A need to regulate an entire space for uniform conditions when some portions have differing, intermittent re

After Situation:

The greenhouse is fitted with a mechanically controlled energy screen installed truss-to-truss or gutter-to-gutter, with side screens as necessary, reducing heat loss in the greenhouse. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Area of Screen

Scenario Unit: Square Foot

Scenario Typical Size: 25,000.0

Scenario Total Cost: $79,694.26

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.19

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 672 - Energy Efficient Building Envelope

Scenario: #6 - Insulated curtains and or sidewall curtains for poultry houses

Scenario Description:

The energy screen system consists of a material, which may be woven, knitted, or non-woven strips of aluminum fiber, polyethylene, nylon or other synthetic material. The screen provides a means to better control loss of heat during day, night or cold weather conditions to reduce energy use. Screens and similar devices may also be used to divide internal areas and allow for differentiated heating, ventilation, or cooling system operation to reduce energy use.

Before Situation:

Heating and cooling of an existing poultry house, or similar structure with conditioned spaces, is inefficient due to poorly regulated heat transfer. A need to regulate an entire space for uniform conditions when some portions have differing, intermittent

After Situation:

The poultry house is fitted with an insulated curtain reducing heat loss in the greenhouse. Associated practices/activities: may include 122-AgEMP - HQ, 672-Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Area of Screen

Scenario Unit: Square Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $1,006.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.35

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 672 - Energy Efficient Building Envelope

Scenario: #7 - Greenhouse - Insulate Unglazed Walls

Scenario Description:

A typical scenario is the installation insulation in green house to address energy loss. The insulation can be either of the cellulose or bubble type (or equivalent). The increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate.

Before Situation:

Green house with standard glazing, plastic or polycarbonate walls and no insulation. Heating and cooling of an existing greenhouse is inefficient due to excessive heat loss.

After Situation:

The greenhouse is fitted with insulation installed truss-to-truss or gutter-to-gutter and/or non glazed endwalls and/or sidewalls, reducing heat loss and gain in the greenhouse. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Square Feet of insulation

Scenario Unit: Square Foot

Scenario Typical Size: 25,000.0

Scenario Total Cost: $10,035.71

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.40

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 672 - Energy Efficient Building Envelope

Scenario: #69 - Wall Insulation, Rigid Foam Board

Scenario Description:

Add 2" extruded polystyrene, rigid foam board (approximate R-10 value), insulation to the walls and ceiling of an existing tobacco barn. Typical barn dimensions are 10' high x 10' wide x 28' long. Total square footage to insulate the walls and ceiling would be 1,040 square feet.

Before Situation:

An agricultural facility with an inefficient building envelope with limited wall insulation.

After Situation:

A more effective and efficient building envelope can be created through addition of, or increased, insulation. Associated practices/activities: may include 128-AgEMP and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Area Insulated

Scenario Unit: Square Foot

Scenario Typical Size: 1,040.0

Scenario Total Cost: $2,970.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 672 - Energy Efficient Building Envelope

Scenario: #85 - Building Envelope, Tunnel Doors

Scenario Description:

A typical scenario is the installation of tunnel doors to replace tunnel curtain openings. Tunnel curtain openings are typically 5 ft. by 60 ft. on each side of a 40 ft. by 500 ft. livestock house; 600 sq. ft. of opening per house.

Before Situation:

A 40 ft. by 500 ft. poultry house with an inefficient building envelope has 5 ft. by 60 ft. tunnel curtain openings on each side of the poultry house.

After Situation:

A more effective and efficient building envelope can be created through replacement of the tunnel curtain openings with tunnel doors. Associated practices/activities: DIA-120, CMA-228, and other activities within 672-Building Envelope Improvement and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency.

Feature Measure: Area of Opening

Scenario Unit: Square Foot

Scenario Typical Size: 600.0

Scenario Total Cost: $9,837.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $16.40

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 672 - Energy Efficient Building Envelope

Scenario: #88 - Insulated Roll-Up Door

Scenario Description:

A typical scenario is the replacement of non-insulated rollup doors in livestock houses or greenhouses with insulated rollup doors. The increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate.

Before Situation:

A livestock house or greenhouse has non-insulated or inefficiently insulated rollup doors causing high heat loss or gain.

After Situation:

A more effective and efficient energy seal can be created through the addition of, or increased R-value, insulated rollup doors. Associated practices/activities: DIA-120, CMA-228, and other activities within 672-Building Envelope Improvement and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency.

Feature Measure: Each Door

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,573.22

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,573.22

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 672 - Energy Efficient Building Envelope

Scenario: #92 - Energy Efficient Glazing

Scenario Description:

The application of this practice consists of the installation of new energy efficient glazing to replace the existing glazing on a structure to reduce heat loss and provide better heat transfer during cold weather conditions while reducing energy use where high-value crops are grown seasonally or year-round. The typical structure is a 30x100 ft. quonset or gothic style structure where the top and sides require 102 ft. length by 42 ft. wide glazing and each end wall requires 32 ft. length and 28 ft. width to replace the existing glazing. In addition, approximately 400 ft. of new spring wire is required for securing the glazing in the existing tracks.

Before Situation:

The existing heated or ventilated greenhouse uses energy inefficiently due to low quality or damaged coverings. Inefficient energy use and a recommendation to implement the improvement has been identified by an ASABE S612 compliant on-farm energy audit or

After Situation:

New greenhouse glazing is installed on an existing greenhouse. The glazing material consists of a multi-layer, minimum 6 mil, greenhouse grade, UV resistant copolymer with infrared retention and anti-condensate properties. The owner must replace the energy efficient glazing with similar qualities at least once during the lifespan of this practice at their expense. An analysis of the estimated annual energy savings is completed. Associated activities: CEMA 228 Agricultural Energy Assessment, DIA 120 Agricultural Energy Design.

Feature Measure: Nominal floor area of green

Scenario Unit: Square Foot

Scenario Typical Size: 3,000.0

Scenario Total Cost: $1,323.60

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.44

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 810 - Annual Forages for Grazing Systems

Scenario: #6 - Annual forages mix

Scenario Description:

Seeding crop, pasture or grazing land to multi-species mix of annual grasses, legumes, forbs or similar species. This mix will address all the planned purposes of the Annual Forages for Grazing Systems (810) standard. Plant forage immediately after harvest of a row crop, small grain, or other forage. Seeding equipment typically used is available on-site. When applicable, terminate the annual forage using an approved method prior to planting a subsequent crop per the NRCS Cover Crop Termination.

Before Situation:

Existing forage stands do not meet the forage demands and or quality for grazing animals, particularly during periods of low forage production. Resource concerns include undesirable plant productivity and health, inadequate feed and forage for livestock,

After Situation:

Established annual forage mix improved livestock nutrition through improved forage quality and quantity, reduced erosion and improved soil condition. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping or pasture system.

Feature Measure: acres of annual forages plan

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $2,061.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $103.07

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 810 - Annual Forages for Grazing Systems

Scenario: #33 - Annuals to Facilitate Renovation or Re-establishment

Scenario Description:

An existing stand of fescue or other perennial forage will be renovated or reestablished. Annual forages provide needed forage quantity to meet the livestock forage demand. Annual forages may be grazed and/or harvested. A combination of seedings of summer and winter annuals with tillage will suppress and smother the existing forage stand. This practice payment scenario covers the expected costs for the annual forages. Use with CPS Pasture and Hay Planting 512 to establish the next perennial forage stand. Typical scenario based on treating 10 acres at a time. Range of typical application is less than or equal to 40 acres.

Before Situation:

An existing stand of fescue or other perennial forage has limited forage quantity and quality to meet the livestock production forage demand. Pasture condition is trending toward low diversity with more undesirable vegetation present. As stand thins, wate

After Situation:

Annual forages were planted and managed to suppress and smother an existing forage stand while providing the forage needed to meet the livestock demand. The site is prepared for the next planting of the perennial forage utilizing CPS 512 Pasture and Hay planting. Resources are protected with the annual forage vegetative cover.

Feature Measure: acres planted

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,630.85

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $263.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 812 - Raised Beds

Scenario: #59 - Unframed Raised Bed field size < 0.10 acres Contamination or Debris Sites only

Scenario Description:

The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Typical size of raised bed is 4ft x 16 ft and minimum 16 inches deep and less than 100 sq ft. Field size 0.10 Acres (4356 sq ft) or less.

Before Situation:

Soils on site are unsuitable for agricultural production. Soil cannot be remediated or debris cannot be removed practically.

After Situation:

Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

Feature Measure: square feet of bed

Scenario Unit: Square Foot

Scenario Typical Size: 85.0

Scenario Total Cost: $412.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.85

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 812 - Raised Beds

Scenario: #60 - Unframed Raised Bedfield size < 0.5 acres Contamination or Debris Sites only

Scenario Description:

The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Bed area is 100 to 500 square feet. Raised bed size and shape varies. Field size up to 0.5 acres. NOT TO BE USED FOR RIDGE TILLAGE.

Before Situation:

Soils on site are unsuitable for agricultural production. Soil cannot be remediated or debris cannot be removed practically.

After Situation:

Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

Feature Measure: square feet per bed

Scenario Unit: Square Foot

Scenario Typical Size: 300.0

Scenario Total Cost: $1,084.95

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 812 - Raised Beds

Scenario: #61 - Framed Raised Bed Small Lot Contamination or Debris Sites only

Scenario Description:

The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Typical size of raised bed 4ft x 16 ft less than or equal to 100 sq ft. Field size 0.10 Acres or less.

Before Situation:

Soils on site are unsuitable for agricultural production. Soil cannot be remediated or debris cannot be removed practically.

After Situation:

Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

Feature Measure: sq ft

Scenario Unit: Square Foot

Scenario Typical Size: 64.0

Scenario Total Cost: $923.92

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $14.44

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 812 - Raised Beds

Scenario: #62 - Framed Raised Bed < 500 sq ft Contamination or Debris Sites only

Scenario Description:

The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Typical size of raised bed ranges from100 square feet to 500 square feet. Field size 0.10 Acres or less.

Before Situation:

Soils on site are unsuitable for agricultural production. Soil cannot be remediated or debris cannot be removed practically.

After Situation:

Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

Feature Measure: sq ft

Scenario Unit: Square Foot

Scenario Typical Size: 200.0

Scenario Total Cost: $1,512.51

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7.56

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 812 - Raised Beds

Scenario: #63 - Framed Raised Bed greater than or equal to 500 sq ft Contamination or Debris Sites only

Scenario Description:

The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Typical size of raised bed ranges from 500 square feet to 2000 square feet. Scenario assumes 16*50 ft bed size.

Before Situation:

Soils on site are unsuitable for agricultural production. Soil cannot be remediated or debris cannot be removed practically.

After Situation:

Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

Feature Measure: sq ft

Scenario Unit: Square Foot

Scenario Typical Size: 800.0

Scenario Total Cost: $3,535.90

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 821 - Low Tunnel Systems

Scenario: #37 - Low tunnel < 1000 square feet- Year 1

Scenario Description:

Garden or small farm grows annual crops including vegetables and other truck crops. Rows require a tunnel or floating cover to extend the growing season (early and late) or to protect from other environmental damage. Typical tunnel floats over crop or is supported by hoop or frame above crop. Tunnel cover is less than 48 inches above the soil. Typical row ranges in size from 30 inches by 200 feet up to 400 feet in length. Producer manages seasonal conditions such as soil temperature, exposure to early or late frost, and insects of food crops. Year 1 of implementation only.

Before Situation:

Crop production occurs within the zone growing season. Plant productivity and health is negatively impacted due to weather/environmental conditions delaying planting.

After Situation:

Row covers are applied and managed to improve plant health and productivity by controlling the micro-climate under the tunnel.

Feature Measure: area covered by tunnel

Scenario Unit: Square Foot

Scenario Typical Size: 500.0

Scenario Total Cost: $3,327.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 821 - Low Tunnel Systems

Scenario: #38 - Low tunnel management- Year 2-3

Scenario Description:

Garden or small farm grows annual crops including vegetables and other truck crops. Rows require a tunnel or floating cover to extend the growing season (early and late) or to protect from other environmental damage. Typical tunnel floats over crop or is supported by hoop or frame above crop. Tunnel cover is less than 48 inches above the soil. Producer manages seasonal conditions such as soil temperature, exposure to early or late frost, and insects of food crops. Year 2-3 of implementation.

Before Situation:

Crop production occurs within the zone growing season. Low tunnel system Year 1 was implemented. Producer is building skill to manage the tunnel coverings as needed during the growing season to improve plant productivity and health.

After Situation:

Row covers are applied and managed to improve plant health and productivity by controlling the micro-climate under the tunnel.

Feature Measure: area of tunnel

Scenario Unit: Square Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $569.59

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 821 - Low Tunnel Systems

Scenario: #39 - Low tunnel 1000-5000 square feet, Year 1

Scenario Description:

Garden or small farm grows annual crops including vegetables and other truck crops. Rows require a tunnel or floating cover to extend the growing season (early and late) or to protect from other environmental damage. Typical tunnel floats over crop or is supported by hoop or frame above crop. Tunnel cover is less than 48 inches above the soil. Typical row ranges in size from 30 inches by 500 feet up to 2000 feet in length. Producer manages seasonal conditions such as soil temperature, exposure to early or late frost, and insects of food crops. Year 1 of implementation only.

Before Situation:

Crop production occurs within the zone growing season. Plant productivity and health is negatively impacted due to weather/environmental conditions delaying planting.

After Situation:

Row covers are applied and managed to improve plant health and productivity by controlling the micro-climate under the tunnel.

Feature Measure: area covered by tunnel

Scenario Unit: Square Foot

Scenario Typical Size: 3,000.0

Scenario Total Cost: $5,221.74

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 823 - Organic Management

Scenario: #2 - Small Scale

Scenario Description:

The typical operation is Transitioning to Organic. The typical farm size is 5 acres or less and fields may be in various stages of organic transition. Organic system include cash row crops, hay or pasture, perennial crops, cover crops and possibly livestock. This practice may be part of a conservation management system to: 1) Improve soil health, 2) Reduce soil erosion, 3) Reduce emissions of greenhouse gases, 4) Reduce transport of pesticides and nutrients transported to surface water, groundwater and air, 5) Improve moisture management, 6) Improve plant productivity and health 7) Reduce plant pest pressure, 8) Enhance habitat for wildlife, pollinators, and other beneficial invertebrates, 9) Improve livestock feed and forage imbalance and 10) Improve or maintain quantity and/or quality of forage for grazing, browsing and productivity. Organic Management Activities with low labor costs will be implemented on a medium to large scale crop production area. In all cases at least one planned organic management activity has risk to an identified resource concern.

Before Situation:

Before practice conditions will vary widely. Conditions range from the client is not using any organic management activities, transitioning to organic on some or all acres, no or limited compliance with National Organic Program requirements; to the client

After Situation:

Planned organic management activities have been implemented to address the identified resource concern(s) and complies with the National Organic Program Requirements. Conservation and organic system actions or operations have been developed or updated with the producer and they have implemented conservation practices with organic management design to address resource concerns. Records are reviewed and evaluated. Improvements planned for the next season are determined.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $11,718.55

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,343.71

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 823 - Organic Management

Scenario: #18 - Simple Crops Only

Scenario Description:

The typical operation is Transitioning to Organic. The typical field size is 40 acres and fields may be in various stages of organic transition. Crop system include cash row crops, hay or pasture, perennial crops and cover crops. This practice may be part of a conservation management system to: 1) Improve soil health, 2) Reduce soil erosion, 3) Reduce emissions of greenhouse gases, 4) Reduce transport of pesticides and nutrients transported to surface water, groundwater and air, 5) Improve moisture management, 6) Improve plant productivity and health 7) Reduce plant pest pressure, 8) Enhance habitat for wildlife, pollinators, and other beneficial invertebrates, 9) Improve livestock feed and forage imbalance and 10) Improve or maintain quantity and/or quality of forage for grazing, browsing and productivity. Organic Management Activities with low labor costs will be implemented on a medium to large scale crop production area. In all cases at least one planned organic management activity has risk to an identified resource concern.

Before Situation:

Before practice conditions will vary widely. Conditions range from the client is not using any organic management activities, transitioning to organic on some or all acres, no or limited compliance with National Organic Program requirements; to the client

After Situation:

Planned organic management activities have been implemented to address the identified resource concern(s) and complies with the National Organic Program Requirements. Conservation and organic system actions or operations have been developed or updated with the producer and they have implemented conservation practices with organic management design to address resource concerns. Records are reviewed and evaluated. Improvements planned for the next season are determined.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $11,855.80

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $296.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 823 - Organic Management

Scenario: #34 - Simple Crops and Livestock

Scenario Description:

The typical operation is Transitioning to Organic. The typical farm size is 40 acres or less and fields may be in various stages of organic transition. Organic system include cash row crops, hay or pasture, perennial crops, cover crops and possibly livestock. This practice may be part of a conservation management system to: 1) Improve soil health, 2) Reduce soil erosion, 3) Reduce emissions of greenhouse gases, 4) Reduce transport of pesticides and nutrients transported to surface water, groundwater and air, 5) Improve moisture management, 6) Improve plant productivity and health 7) Reduce plant pest pressure, 8) Enhance habitat for wildlife, pollinators, and other beneficial invertebrates, 9) Improve livestock feed and forage imbalance and 10) Improve or maintain quantity and/or quality of forage for grazing, browsing and productivity. Organic Management Activities with low labor costs will be implemented on a medium to large scale crop production area. In all cases at least one planned organic management activity has risk to an identified resource concern.

Before Situation:

Before practice conditions will vary widely. Conditions range from the client is not using any organic management activities, transitioning to organic on some or all acres, no or limited compliance with National Organic Program requirements; to the client

After Situation:

Planned organic management activities have been implemented to address the identified resource concern(s) and complies with the National Organic Program Requirements. Conservation and organic system actions or operations have been developed or updated with the producer and they have implemented conservation practices with organic management design to address resource concerns. Records are reviewed and evaluated. Improvements planned for the next season are determined.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $15,565.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $389.14

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 823 - Organic Management

Scenario: #50 - Certified Organic

Scenario Description:

The typical operation is Certified Organic. The typical farm size is 40 acres or less and fields may be in various stages of organic transition. Organic system include cash row crops, hay or pasture, perennial crops, cover crops and possibly livestock. This practice may be part of a conservation management system to: 1) Improve soil health, 2) Reduce soil erosion, 3) Reduce emissions of greenhouse gases, 4) Reduce transport of pesticides and nutrients transported to surface water, groundwater and air, 5) Improve moisture management, 6) Improve plant productivity and health 7) Reduce plant pest pressure, 8) Enhance habitat for wildlife, pollinators, and other beneficial invertebrates, 9) Improve livestock feed and forage imbalance and 10) Improve or maintain quantity and/or quality of forage for grazing, browsing and productivity. Organic Management Activities with low labor costs will be implemented on a medium to large scale crop production area. In all cases at least one planned organic management activity has risk to an identified resource concern.

Before Situation:

Before practice conditions will vary widely. Conditions range from the client is using some organic management activities, to the client is using many organic management activities to address resource concerns. The client will improve or maintain at least

After Situation:

Planned organic management activities have been implemented to address the identified resource concern(s) and complies with the National Organic Program Requirements. Conservation and organic system actions or operations have been developed or updated with the producer and they have implemented conservation practices with organic management design to address resource concerns. Records are reviewed and evaluated. Improvements planned for the next season are determined.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $4,696.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $117.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 823 - Organic Management

Scenario: #66 - Irrigated Pasture for Livestock

Scenario Description:

The typical operation is Transitioning to Organic. The typical pasture system size is 100 acres supporting 100 to 150 cattle or cow-calf pairs, and fields may be in various stages of organic transition. Organic system includes irrigated forage/grass. This practice may be part of a conservation management system to: 1) Improve soil health, 2) Reduce soil erosion, 3) Reduce emissions of greenhouse gases, 4) Reduce transport of pesticides and nutrients transported to surface water, groundwater and air, 5) Improve moisture management, 6) Improve plant productivity and health 7) Reduce plant pest pressure, 8) Enhance habitat for wildlife, pollinators, and other beneficial invertebrates, 9) Improve livestock feed and forage imbalance and 10) Improve or maintain quantity and/or quality of forage for grazing, browsing and productivity. Organic Management Activities with low labor costs will be implemented on a medium to large scale crop production area. In all cases at least one planned organic management activity has risk to an identified resource concern.

Before Situation:

Before practice conditions will vary widely. Conditions range from the client is not using any organic management activities, transitioning to organic on some or all acres, no or limited compliance with National Organic Program requirements; to the client

After Situation:

Planned organic management activities have been implemented to address the identified resource concern(s) and complies with the National Organic Program Requirements. Conservation and organic system actions or operations have been developed or updated with the producer and they have implemented conservation practices with organic management design to address resource concerns. Records are reviewed and evaluated. Improvements planned for the next season are determined.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $17,321.70

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $173.22

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 823 - Organic Management

Scenario: #82 - Complex Crops Only

Scenario Description:

The typical operation is Transitioning to Organic. The typical field size is 40 acres and fields may be in various stages of organic transition. Crop system include cash row crops, hay or pasture, perennial crops and cover crops. This practice may be part of a conservation management system to: 1) Improve soil health, 2) Reduce soil erosion, 3) Reduce emissions of greenhouse gases, 4) Reduce transport of pesticides and nutrients transported to surface water, groundwater and air, 5) Improve moisture management, 6) Improve plant productivity and health 7) Reduce plant pest pressure, 8) Enhance habitat for wildlife, pollinators, and other beneficial invertebrates, 9) Improve livestock feed and forage imbalance and 10) Improve or maintain quantity and/or quality of forage for grazing, browsing and productivity. Organic Management Activities with low labor costs will be implemented on a medium to large scale crop production area. In all cases at least one planned organic management activity has risk to an identified resource concern.

Before Situation:

Before practice conditions will vary widely. Conditions range from the client is not using any organic management activities, transitioning to organic on some or all acres, no or limited compliance with National Organic Program requirements; to the client

After Situation:

Planned organic management activities have been implemented to address the identified resource concern(s) and complies with the National Organic Program Requirements. Conservation and organic system actions or operations have been developed or updated with the producer and they have implemented conservation practices with organic management design to address resource concerns. Records are reviewed and evaluated. Improvements planned for the next season are determined.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $13,523.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $338.10

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 823 - Organic Management

Scenario: #98 - Complex Crops and Livestock

Scenario Description:

The typical operation is Transitioning to Organic. The typical field size is 40 acres and fields may be in various stages of organic transition. Organic system includes cash row crops, hay or pasture, perennial crops, cover crops and livestock. This practice may be part of a conservation management system to: 1) Improve soil health, 2) Reduce soil erosion, 3) Reduce emissions of greenhouse gases, 4) Reduce transport of pesticides and nutrients transported to surface water, groundwater and air, 5) Improve moisture management, 6) Improve plant productivity and health 7) Reduce plant pest pressure, 8) Enhance habitat for wildlife, pollinators, and other beneficial invertebrates, 9) Improve livestock feed and forage imbalance and 10) Improve or maintain quantity and/or quality of forage for grazing, browsing and productivity. Organic Management Activities with low labor costs will be implemented on a medium to large scale crop production area. In all cases at least one planned organic management activity has risk to an identified resource concern.

Before Situation:

Before practice conditions will vary widely. Conditions range from the client is not using any organic management activities, transitioning to organic on some or all acres, no or limited compliance with National Organic Program requirements; to the client

After Situation:

Planned organic management activities have been implemented to address the identified resource concern(s) and complies with the National Organic Program Requirements. Conservation and organic system actions or operations have been developed or updated with the producer and they have implemented conservation practices with organic management design to address resource concerns. Records are reviewed and evaluated. Improvements planned for the next season are determined.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $18,508.07

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $462.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 823 - Organic Management

Scenario: #114 - Small Scale FI

Scenario Description:

The typical operation is Transitioning to Organic. The typical farm size is 5 acres or less and fields may be in various stages of organic transition. Organic system include cash row crops, hay or pasture, perennial crops, cover crops and possibly livestock. This practice may be part of a conservation management system to: 1) Improve soil health, 2) Reduce soil erosion, 3) Reduce emissions of greenhouse gases, 4) Reduce transport of pesticides and nutrients transported to surface water, groundwater and air, 5) Improve moisture management, 6) Improve plant productivity and health 7) Reduce plant pest pressure, 8) Enhance habitat for wildlife, pollinators, and other beneficial invertebrates, 9) Improve livestock feed and forage imbalance and 10) Improve or maintain quantity and/or quality of forage for grazing, browsing and productivity. Organic Management Activities with low labor costs will be implemented on a medium to large scale crop production area. In all cases at least one planned organic management activity has risk to an identified resource concern.

Before Situation:

Before practice conditions will vary widely. Conditions range from the client is not using any organic management activities, transitioning to organic on some or all acres, no or limited compliance with National Organic Program requirements; to the client

After Situation:

Planned organic management activities have been implemented to address the identified resource concern(s) and complies with the National Organic Program Requirements. Conservation and organic system actions or operations have been developed or updated with the producer and they have implemented conservation practices with organic management design to address resource concerns. Records are reviewed and evaluated. Improvements planned for the next season are determined.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $12,869.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,573.93

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 823 - Organic Management

Scenario: #130 - Simple Crops Only FI

Scenario Description:

The typical operation is Transitioning to Organic. The typical farm size is 5 acres or less and fields may be in various stages of organic transition. Organic system include cash row crops, hay or pasture, perennial crops, cover crops and possibly livestock. This practice may be part of a conservation management system to: 1) Improve soil health, 2) Reduce soil erosion, 3) Reduce emissions of greenhouse gases, 4) Reduce transport of pesticides and nutrients transported to surface water, groundwater and air, 5) Improve moisture management, 6) Improve plant productivity and health 7) Reduce plant pest pressure, 8) Enhance habitat for wildlife, pollinators, and other beneficial invertebrates, 9) Improve livestock feed and forage imbalance and 10) Improve or maintain quantity and/or quality of forage for grazing, browsing and productivity. Organic Management Activities with low labor costs will be implemented on a medium to large scale crop production area. In all cases at least one planned organic management activity has risk to an identified resource concern.

Before Situation:

Before practice conditions will vary widely. Conditions range from the client is not using any organic management activities, transitioning to organic on some or all acres, no or limited compliance with National Organic Program requirements; to the client

After Situation:

Planned organic management activities have been implemented to address the identified resource concern(s) and complies with the National Organic Program Requirements. Conservation and organic system actions or operations have been developed or updated with the producer and they have implemented conservation practices with organic management design to address resource concerns. Records are reviewed and evaluated. Improvements planned for the next season are determined.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $12,896.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $322.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 823 - Organic Management

Scenario: #146 - Simple Crops and Livestock FI

Scenario Description:

The typical operation is Transitioning to Organic. The typical field size is 40 acres and fields may be in various stages of organic transition. Organic system include cash row crops, hay or pasture, perennial crops, cover crops and livestock. This practice may be part of a conservation management system to: 1) Improve soil health, 2) Reduce soil erosion, 3) Reduce emissions of greenhouse gases, 4) Reduce transport of pesticides and nutrients transported to surface water, groundwater and air, 5) Improve moisture management, 6) Improve plant productivity and health 7) Reduce plant pest pressure, 8) Enhance habitat for wildlife, pollinators, and other beneficial invertebrates, 9) Improve livestock feed and forage imbalance and 10) Improve or maintain quantity and/or quality of forage for grazing, browsing and productivity. Organic Management Activities with low labor costs will be implemented on a medium to large scale crop production area. In all cases at least one planned organic management activity has risk to an identified resource concern.

Before Situation:

Before practice conditions will vary widely. Conditions range from the client is not using any organic management activities, transitioning to organic on some or all acres, no or limited compliance with National Organic Program requirements; to the client

After Situation:

Planned organic management activities have been implemented to address the identified resource concern(s) and complies with the National Organic Program Requirements. Conservation and organic system actions or operations have been developed or updated with the producer and they have implemented conservation practices with organic management design to address resource concerns. Records are reviewed and evaluated. Improvements planned for the next season are determined.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $16,606.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $415.16

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 823 - Organic Management

Scenario: #162 - Complex Crops FI

Scenario Description:

The typical operation is Transitioning to Organic. The typical field size is 40 acres and fields may be in various stages of organic transition. Crop system include cash row crops, hay or pasture, perennial crops and cover crops. This practice may be part of a conservation management system to: 1) Improve soil health, 2) Reduce soil erosion, 3) Reduce emissions of greenhouse gases, 4) Reduce transport of pesticides and nutrients transported to surface water, groundwater and air, 5) Improve moisture management, 6) Improve plant productivity and health 7) Reduce plant pest pressure, 8) Enhance habitat for wildlife, pollinators, and other beneficial invertebrates, 9) Improve livestock feed and forage imbalance and 10) Improve or maintain quantity and/or quality of forage for grazing, browsing and productivity. Organic Management Activities with low labor costs will be implemented on a medium to large scale crop production area. In all cases at least one planned organic management activity has risk to an identified resource concern.

Before Situation:

Before practice conditions will vary widely. Conditions range from the client is not using any organic management activities, transitioning to organic on some or all acres, no or limited compliance with National Organic Program requirements; to the client

After Situation:

Planned organic management activities have been implemented to address the identified resource concern(s) and complies with the National Organic Program Requirements. Conservation and organic system actions or operations have been developed or updated with the producer and they have implemented conservation practices with organic management design to address resource concerns. Records are reviewed and evaluated. Improvements planned for the next season are determined.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $21,973.70

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $549.34

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 823 - Organic Management

Scenario: #178 - Complex Crops and Livestock FI

Scenario Description:

The typical operation is Transitioning to Organic. The typical field size is 40 acres and fields may be in various stages of organic transition. Organic system includes cash row crops, hay or pasture, perennial crops, cover crops and livestock. This practice may be part of a conservation management system to: 1) Improve soil health, 2) Reduce soil erosion, 3) Reduce emissions of greenhouse gases, 4) Reduce transport of pesticides and nutrients transported to surface water, groundwater and air, 5) Improve moisture management, 6) Improve plant productivity and health 7) Reduce plant pest pressure, 8) Enhance habitat for wildlife, pollinators, and other beneficial invertebrates, 9) Improve livestock feed and forage imbalance and 10) Improve or maintain quantity and/or quality of forage for grazing, browsing and productivity. Organic Management Activities with low labor costs will be implemented on a medium to large scale crop production area. In all cases at least one planned organic management activity has risk to an identified resource concern.

Before Situation:

Before practice conditions will vary widely. Conditions range from the client is not using any organic management activities, transitioning to organic on some or all acres, no or limited compliance with National Organic Program requirements; to the client

After Situation:

Planned organic management activities have been implemented to address the identified resource concern(s) and complies with the National Organic Program Requirements. Conservation and organic system actions or operations have been developed or updated with the producer and they have implemented conservation practices with organic management design to address resource concerns. Records are reviewed and evaluated. Improvements planned for the next season are determined.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $26,957.94

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $673.95

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 823 - Organic Management

Scenario: #194 - Simple Crops Large Acreage

Scenario Description:

The typical operation is Transitioning to Organic. The typical operation size is 1280 acres and fields may be in various stages of organic transition. Crop system include cash row crops, hay or pasture, perennial crops and cover crops. This practice may be part of a conservation management system to: 1) Improve soil health, 2) Reduce soil erosion, 3) Reduce emissions of greenhouse gases, 4) Reduce transport of pesticides and nutrients transported to surface water, groundwater and air, 5) Improve moisture management, 6) Improve plant productivity and health 7) Reduce plant pest pressure, 8) Enhance habitat for wildlife, pollinators, and other beneficial invertebrates, 9) Improve livestock feed and forage imbalance and 10) Improve or maintain quantity and/or quality of forage for grazing, browsing and productivity. Organic Management Activities with low labor costs will be implemented on a medium to large scale crop production area. In all cases at least one planned organic management activity has risk to an identified resource concern.

Before Situation:

Before practice conditions will vary widely. Conditions range from the client is not using any organic management activities, transitioning to organic on some or all acres, no or limited compliance with National Organic Program requirements; to the client

After Situation:

Planned organic management activities have been implemented to address the identified resource concern(s) and complies with the National Organic Program Requirements. Conservation and organic system actions or operations have been developed or updated with the producer and they have implemented conservation practices with organic management design to address resource concerns. Records are reviewed and evaluated. Improvements planned for the next season are determined.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 1,280.0

Scenario Total Cost: $123,961.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $96.84

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: 823 - Organic Management

Scenario: #210 - Simple Crops Large Acreage FI

Scenario Description:

The typical operation is Transitioning to Organic. The typical operation size is 1280 acres and fields may be in various stages of organic transition. Crop system include cash row crops, hay or pasture, perennial crops and cover crops. This practice may be part of a conservation management system to: 1) Improve soil health, 2) Reduce soil erosion, 3) Reduce emissions of greenhouse gases, 4) Reduce transport of pesticides and nutrients transported to surface water, groundwater and air, 5) Improve moisture management, 6) Improve plant productivity and health 7) Reduce plant pest pressure, 8) Enhance habitat for wildlife, pollinators, and other beneficial invertebrates, 9) Improve livestock feed and forage imbalance and 10) Improve or maintain quantity and/or quality of forage for grazing, browsing and productivity. Organic Management Activities with low labor costs will be implemented on a medium to large scale crop production area. In all cases at least one planned organic management activity has risk to an identified resource concern.

Before Situation:

Before practice conditions will vary widely. Conditions range from the client is not using any organic management activities, transitioning to organic on some or all acres, no or limited compliance with National Organic Program requirements; to the client

After Situation:

Planned organic management activities have been implemented to address the identified resource concern(s) and complies with the National Organic Program Requirements. Conservation and organic system actions or operations have been developed or updated with the producer and they have implemented conservation practices with organic management design to address resource concerns. Records are reviewed and evaluated. Improvements planned for the next season are determined.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 1,280.0

Scenario Total Cost: $157,256.71

Total Cost per Unit: $122.86

Based on Tennessee average costs. Individual county costs may vary.

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000BFF1 - Buffer Bundle#1

Scenario: #1 - Bundle, Wildlife Habitat Buffer

Scenario Description:
Addresses water quality degradation, degraded plant condition, fish/wildlife inadequate habitat, and/or air quality impacts.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 3.0

Scenario Total Cost: $9,376.94

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,125.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL10 - YEAR 1 Irrigated Cropland (MRBI/Ogallala)

Scenario: #11 - Bundle, Year One Irrigated Cropland

Scenario Description:
Addresses water quality degradation, insufficient water, soil erosion, and inefficient energy.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where en

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $14,566.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $145.67

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL11 - YEAR 2+ Irrigated Cropland (MRBI/Ogallala)

Scenario: #2 - Bundle, Year Two Irrigated Cropland

Scenario Description:
Addresses water quality degradation, insufficient water, and soil erosion.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acres of cropland where en

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $4,915.21

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $49.15

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL12 - Non-Irrigated Precision Ag (MRBI)

Scenario: #2 - Bundle, Non-Irrigated Precision Agriculture Cropland

Scenario Description:
Addresses water quality degradation, soil quality, and soil erosion.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where en

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $4,774.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $47.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL13 - Non-Irrigated Cropland (MRBI)

Scenario: #2 - Bundle, Non-Irrigated Cropland

Scenario Description:
Addresses water quality degradation, soil quality, and soil erosion.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acres of cropland where en

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $3,559.18

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $35.59

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL14 - YEAR 1 Irrigated Precision Ag Cropland (MRBI)

Scenario: #2 - Bundle, Year One Irrigated Precision Agriculture Cropland

Scenario Description:
Addresses water quality degradation, insufficient water, soil erosion, and inefficient energy.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where en

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $15,328.68

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $153.29

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL15 - YEAR 2+ Irrigated Precision Ag Cropland (MRBI)

Scenario: #2 - Bundle, Year Two Irrigated Precision Agriculture Cropland

Scenario Description:
Addresses water quality degradation, insufficient water, and soil erosion.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where en

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $5,677.11

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $56.77

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL16 - Non-Irrigated Cropland with Water Bodies (MRBI)

Scenario: #2 - Bundle, Non-Irrigated Cropland near Water

Scenario Description:
Addresses water quality degradation, soil erosion, and soil quality

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where en

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $4,596.22

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $45.96

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL17 - Non-Irrigated Cropland with Water Bodies Riparian Forest Buffer (MRBI)

Scenario: #2 - Bundle, Non-Irrigated Cropland with Riparian Buffer

Scenario Description:
Addresses water quality degradation, soil erosion, and soil quality

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where en

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $8,341.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $83.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL18 - Crop Bundle #18 - Precision Ag

Scenario: #2 - Bundle, Precision Agriculture

Scenario Description:
Addresses water quality degradation, fish and wildlife inadequate habitat, air quality impairment, and either soil erosion or soil quality degradation resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where en

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $4,872.61

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $48.73

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL19 - Crop Bundle #19 - Soil Health Precision Ag

Scenario: #2 - Bundle, Precision Agriculture for Soil Health

Scenario Description:
Addresses water quality degradation, soil quality degradation, fish and wildlife inadequate habitat, and insufficient water resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where en

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $4,691.77

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $46.92

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL20 - Crop Bundle #20 - Soil Health Assessment

Scenario: #2 - Bundle, Soil Health Suite

Scenario Description:
Addresses water quality degradation, soil quality degradation, fish and wildlife inadequate habitat, and insufficient water resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acres of cropland where en

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $4,099.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $40.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL21 - Crop Bundle #21 - Crop Bundle (Organic)

Scenario: #2 - Bundle, Organic Management

Scenario Description:
Addresses soil quality degradation, water quality degradation, and degraded plant condition resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acres of cropland where en

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $6,447.57

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $64.48

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL22 - Crop Bundle #22 - Erosion Bundle (Organic)

Scenario: #2 - Bundle, Organic Erosion Management

Scenario Description:
Addresses soil quality degradation, water quality degradation, soil erosion, and fish and wildlife inadequate habitat resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acres of cropland where en

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $4,418.07

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $44.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL23 - Crop Bundle #23 - Pheasant and quail habitat

Scenario: #6 - Bundle, Pheasant and Quail Habitat

Scenario Description:
Addresses wildlife inadequate habitat, water quality degradation and/or air quality impacts, and soil health and/or degraded plant condition.

Before Situation:
Resources are protected at the minimum level of the conservation practice standards applied as part of the bundle.

After Situation:
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acres where the bundle is i

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $2,705.29

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $67.63

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL24 - Crop Bundle #24 - Cropland Soil Health Management System

Scenario: #2 - Bundle, Soil Health on Cropland

Scenario Description:
Addresses soil health, water quality (or water quality and air quality), and either soil erosion, soil compaction, or plant pest pressure.

Before Situation:
Resources are protected at the minimum level of the conservation practice standards applied as part of the bundle.

After Situation:
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $3,086.16

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $30.86

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000CPL25 - Climate Smart Advanced Soil Health

Scenario: #2 - Bundle, Climate Smart

Scenario Description:
Improve crop land soil health by minimizing soil disturbance, PAMS pest management, building soil organic matter, providing habitat and reducing nutrient and pesticide loss to water.

Before Situation:
Resources are protected at the minimum level of the conservation practice standards applied as part of the bundle.

After Situation:
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acres applied

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $15,381.92

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $153.82

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000FST1 - Forest Bundle#1

Scenario: #1 - Bundle, Enhance Understory for Wildlife and Mast Production

Scenario Description:
?Addresses forest management on sites that are not adapted to natural fire disturbances. Addresses resource concerns air quality impacts, degraded plant condition and fish/wildlife inadequate habitat.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $29,971.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,498.56

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000FST2 - Forest Bundle #2 - Post-fire Management

Scenario: #13 - Bundle, Post-Fire Management

Scenario Description:
Forest stand improvement that improves forest health to reduce the risk of wildfire and wildlife habitat. Addresses air quality impacts, degraded plant condition, and fish/wildlife inadequate habitat.

Before Situation:
Resources are protected at the minimum level of conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $10,747.44

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,074.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000FST3 - Forest Bundle #3

Scenario: #2 - Bundle, Forest Stand Improvement and Brush Management

Scenario Description:
Forest stand improvement that improves forest health due to poor logging practices. Addresses soil organic matter depletion, degraded plant condition, and inadequate fish/wildlife habitat.

Before Situation:
Resources are protected at the minimum level of conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $10,669.77

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $533.49

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000FST4 - Forest Bundle #4

Scenario: #2 - Bundle, Sugar Maple

Scenario Description:
Forest management to improve sugar maple stands. Addresses soil organic matter depletion, degraded plant condition, and inadequate fish/wildlife habitat.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $27,279.57

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,363.98

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000GRZ1 - Grazing Bundle 1 - Range and Pasture

Scenario: #2 - Bundle, Improve Ecological Site

Scenario Description:
This bundle addresses soil erosion, degraded plant condition, and fish and wildlife inadequate habitat resource concerns through adoption of enhancements E528L, E315A, and E645A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $4,087.49

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $102.19

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000GRZ2 - Grazing Bundle 2 - Range and Pasture

Scenario: #2 - Bundle, Streambank Protection

Scenario Description:
This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E382A, and E580A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 3.5

Scenario Total Cost: $9,336.85

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,667.67

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000GRZ3 - Grazing Bundle 3 - Range and Pasture

Scenario: #2 - Bundle, Manage Riparian Herbaceous Cover

Scenario Description:
This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E390B, and E580A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 6.0

Scenario Total Cost: $10,679.69

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,779.95

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000GRZ4 - Grazing Bundle 4 - Range and Pasture

Scenario: #2 - Bundle, Manage Riparian Forest Cover

Scenario Description:
This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E391C, and E580A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 4.0

Scenario Total Cost: $13,485.20

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,371.30

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000GRZ5 - Grazing Bundle 5 - Range and Pasture

Scenario: #2 - Bundle, Enhance Forage Community

Scenario Description:
This bundle addresses livestock production limitation, degraded plant condition, and fish and wildlife inadequate habitat resource concerns through adoption of enhancements E528A, E315A, and E645A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1,050.0

Scenario Total Cost: $6,918.60

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.59

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000LLP1 - Longleaf Pine Bundle#1

Scenario: #1 - Bundle, Longleaf Pine One

Scenario Description:
?Improves conifer forest health through prescribed burning and grazing management. Addresses water quality degradation, degraded plant condition, and fish/wildlife inadequate habitat.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 110.0

Scenario Total Cost: $13,259.16

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $120.54

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000LLP2 - Longleaf Pine Bundle#2

Scenario: #1 - Bundle, Longleaf Pine Two

Scenario Description:
Improves conifer forest health through prescribed burning and forest stand management. Addresses air quality impacts, degraded plant condition, and fish/wildlife inadequate habitat.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $19,170.51

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $383.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000LLP4 - Longleaf Pine Bundle #4

Scenario: #2 - Bundle, Longleaf Pine Four

Scenario Description:
Improves forest health and wildlife habitat through conversion of forest stands that are not predominantly longleaf pine. Addresses degraded plant condition, fish/wildlife inadequate food and habitat, and water quality.

Before Situation:
Resources are protected at the minimum level of the conservation practice standards applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standards applied.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $20,984.76

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $419.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000PST5 - Pasture Bundle 5

Scenario: #2 - Bundle, Manage Riparian Areas

Scenario Description:
Implementation of site specific strategies applied to range or pasture land uses through adoption of the following CSP enhancements: E528J, E315A, and E645A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
Adoption of these bundled enhancements provides a combined benefit for resource protection that exceeds the minimum level for the associated practice standards in order to address the resource concerns Soil Erosion or Water Quality Degradation, Degraded Plant Condition, and Fish and Wildlife Inadequate Habitat.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 60.0

Scenario Total Cost: $4,222.49

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $70.37

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000PSTX - Pasture Bundle #6 - Pasture

Scenario: #9 - Bundle, Manage Soil Organic Matter

Scenario Description:

Managing the harvest of vegetation with grazing and/or browsing animals for the purposes of maintaining desired pasture composition/plant vigor and improving/maintaining quantity and quality of forage for the animals' health and productivity following the recommendations of a qualifying professional, as detailed in the documentation and implementation requirements. Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that can provide the structure and composition needed to enhance livestock and wildlife habitat, particularly when targeted forage supply and quality, cover, and shelter are not available in other pastures.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing. Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Pasture and Hay Planting. Resources are prote

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing. The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Pasture and Hay Planting. The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 315-Herbaceous Weed Treatment.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $10,208.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $102.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: B000RNG4 - Range Bundle 4

Scenario: #2 - Bundle, Range Monitoring

Scenario Description:
Implementation of site specific strategies applied to range through adoption of the following CSP enhancements: E528N, E315A, and E645A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
Adoption of these bundled enhancements provides a combined benefit for resource protection that exceeds the minimum level for the associated practice standards in order to address the resource concerns Soil Erosion, Degraded Plant Condition, and Fish and Wildlife Inadequate Habitat.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $4,781.19

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $95.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E199A - Comprehensive Conservation Plan

Scenario: #2 - Single Enterprise, Low

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer's operation. This typical scenario involves one agricultural enterprise and a.) 1 Land use with less than or equal to 4 priority resource concerns, OR b.) 2-3 Land Uses with less than or equal to two priority resource concern categories per land use.

Before Situation:

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

After Situation:

TSP conducts an on-site inventory of all land uses and land management systems in the producer's operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guide sheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,122.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,122.00

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E199A - Comprehensive Conservation Plan

Scenario: #18 - Single Enterprise, Medium

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer's operation. This typical scenario involves one agricultural enterprise and a.) 1 Land Use with greater than 4 priority resource concerns, OR b.) 2-3 Land Use with 3 to 4 priority resource concern categories per land use, OR c.) 4 or more Land Use with less than or equal to 2 priority resource concerns.

Before Situation:

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

After Situation:

TSP conducts an on-site inventory of all land uses and land management systems in the producer's operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guide sheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $9,269.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9,269.02

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E199A - Comprehensive Conservation Plan

Scenario: #34 - Single Enterprise, High

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer's operation. This typical scenario involves one agricultural enterprise and a.) 2-3 Land Use with 4 or more priority resource concern categories per land use, OR b.) 4 or more Land Use with 3 to 4 priority resource concerns.

Before Situation:

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

After Situation:

TSP conducts an on-site inventory of all land uses and land management systems in the producer's operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guide sheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $11,486.08

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11,486.08

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E199A - Comprehensive Conservation Plan

Scenario: #50 - Multiple Enterprise, Medium

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer's operation. This typical scenario involves two or more agricultural enterprises and a.) 1 Land Use with up to 4 priority resource concerns, OR b.) 2-3 Land Use with 1 to 2 priority resource concern categories per land use.

Before Situation:

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

After Situation:

TSP conducts an on-site inventory of all land uses and land management systems in the producer's operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guide sheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $12,773.41

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12,773.41

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E199A - Comprehensive Conservation Plan

Scenario: #66 - Multiple Enterprise, High

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer's operation. This typical scenario involves two or more agricultural enterprises and a.) 2-3 Land Use with 3 to 4 priority resource concern categories per land use, OR b.) 2-3 Land Use with 4 or more priority resource concerns, OR c.) 4 or more Land Use with any amount of priority resource concerns

Before Situation:

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

After Situation:

TSP conducts an on-site inventory of all land uses and land management systems in the producer's operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guide sheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $14,741.64

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $14,741.64

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #82 - EAP Cropland, Level 1

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers cropland.

Before Situation:
Producer implements conservation activities on cropland that address two to three resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treaded

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $6.62 *Based on Tennessee average costs. Individual county costs may vary.*

Total Cost per Unit: $6.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #98 - EAP Cropland, Level 2

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers cropland.

Before Situation:
Producer implements conservation activities on cropland that address four to six resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost:	$8.49	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$8.49	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #114 - EAP Cropland, Level 3

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers cropland.

Before Situation:
Producer implements conservation activities on cropland that address seven or more resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $11.82 *Based on Tennessee average costs. Individual county costs may vary.*

Total Cost per Unit: $11.82

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #130 - EAP Pasture, Level 1

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers pasture.

Before Situation:
Producer implements conservation activities on pasture that address two to three resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $5.17 *Based on Tennessee average costs. Individual county costs may vary.*

Total Cost per Unit: $5.17

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #146 - EAP Pasture, Level 2

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers pasture.

Before Situation:
Producer implements conservation activities on pasture that address four to six resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $6.89 *Based on Tennessee average costs. Individual county costs may vary.*

Total Cost per Unit: $6.89

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #162 - EAP Pasture, Level 3

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers pasture.

Before Situation:
Producer implements conservation activities on pasture that address seven or more resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost:	$10.61	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$10.61	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #178 - EAP Range, Level 1

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers rangeland.

Before Situation:
Producer implements conservation activities on rangeland that address two to three resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $3.71 *Based on Tennessee average costs. Individual county costs may vary.*

Total Cost per Unit: $3.71

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #194 - EAP Range, Level 2

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers rangeland.

Before Situation:
Producer implements conservation activities on rangeland that address four to six resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $4.67 *Based on Tennessee average costs. Individual county costs may vary.*

Total Cost per Unit: $4.67

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #210 - EAP Range, Level 3

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers rangeland.

Before Situation:
Producer implements conservation activities on rangeland that address seven or more resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost:	$5.96	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$5.96	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #226 - EAP Forest, Level 1

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers non-industrialized private forest.

Before Situation:
Producer implements conservation activities on forest that address two to three resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $3.93 *Based on Tennessee average costs. Individual county costs may vary.*

Total Cost per Unit: $3.93

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #242 - EAP Forest, Level 2

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers non-industrialized private forest.

Before Situation:
Producer implements conservation activities on forest that address four to six resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $5.72 *Based on Tennessee average costs. Individual county costs may vary.*

Total Cost per Unit: $5.72

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #258 - EAP Forest, Level 3

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers non-industrialized private forest.

Before Situation:
Producer implements conservation activities on forest that address seven or more resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $8.47 *Based on Tennessee average costs. Individual county costs may vary.*

Total Cost per Unit: $8.47

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #274 - EAP AAL, Level 1

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers associated ag land.

Before Situation:
Producer implements conservation activities on associated ag land that address two to three resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $8.16

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.16

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #290 - EAP AAL, Level 2

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers associated ag land.

Before Situation:
Producer implements conservation activities on associated ag land that address four to six resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $16.70

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $16.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #306 - EAP Farmstead, Level 1

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers farmsteads.

Before Situation:
Producer implements conservation activities on farmsteads that address two to three resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost:	$10.99	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$10.99	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #322 - EAP Farmstead, Level 2

Scenario Description:
This existing activity payment (EAP1) provides a participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers farmsteads.

Before Situation:
Producer implements conservation activities on farmsteads that address four or more resource concerns at the time of enrollment.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $15.90 *Based on Tennessee average costs. Individual county costs may vary.*

Total Cost per Unit: $15.90

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP2 - Existing Activity Payment-Resource Concern

Scenario: #18 - EAP2, General Contracts

Scenario Description:
This existing activity payment component (EAP2) provides a participant with a payment for existing stewardship specific to the number of resource concerns met at the time of enrollment.

Before Situation:
Producer implements conservation activities across all land uses included in the operation.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Per contract

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,800.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,800.00

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E300EAP2 - Existing Activity Payment-Resource Concern

Scenario: #34 - EAP2, Renewal Contracts

Scenario Description:
This existing activity payment component (EAP2) provides a participant with a payment for existing stewardship specific to the number of resource concerns met at the time of enrollment.

Before Situation:
Producer implements conservation activities across all land uses included in the operation.

After Situation:
Through participation in the program, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Per contract

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,000.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3,000.00

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E314A - Brush management to improve wildlife habitat

Scenario: #1 - Wildlife Habitat

Scenario Description:

Brush management is employed to create a desired plant community, consistent with the related ecological site steady state, which will maintain or enhance the wildlife habitat desired for the identified wildlife species. It will be designed to provide plant structure, density and diversity needed to meet those habitat objectives. This enhancement does not apply to removal of woody vegetation by prescribed fire or removal of woody vegetation to facilitate a land use change.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 314 - Brush Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 314 - Brush Management

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,857.14

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $18.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E315A - Herbaceous weed treatment to create plant communities consistent with the ecological site

Scenario: #1 - Enhance Plant Community within an Ecological Site

Scenario Description:
Mechanical, chemical, or biological, herbaceous weed treatment will be employed to control targeted, herbaceous weeds so as to create, release, or restore desired plant communities that are consistent with achievable, ecological site, steady state descriptions.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 315 - Herbaceous Weed Control

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 315 - Herbaceous Weed Control

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $151.15

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $15.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E327B - Establish Monarch butterfly habitat

Scenario: #1 - Nectar Plants for Monarchs

Scenario Description:
Seed or plug milkweed (Asclepias spp.), and high-value monarch butterfly nectar plants on marginal cropland, field borders, contour buffer strips, and similar areas.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 327 - Conservation Cover

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 327 - Conservation Cover

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $994.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $994.83

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E328A - Resource conserving crop rotation

Scenario: #1 - Resource Conserving Crop Rotation

Scenario Description:

Establish a Resource Conserving Crop Rotation. Rotation must include AT LEAST one resource conserving crop as determined by the State Conservationist in a minimum three year crop rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plant pest pressures.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,615.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $16.15

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E328B - Improved resource conserving crop rotation

Scenario: #1 - Improved Resource Conserving Crop Rotation

Scenario Description:

Improve an existing Resource Conserving Crop Rotation. Must enrich an existing rotation which already includes AT LEAST one resource conserving crop as determined by the State Conservationist in a minimum three year crop rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plant pest pressures.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $576.95

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.77

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E328C - Conservation crop rotation on recently converted CRP grass/legume cover

Scenario: #1 - Water and Wind Erosion Protection

Scenario Description:

Implement a crop rotation management system on crop land acres that have recently converted from CRP grass/legume conservation cover to annual planted crops. Crop rotation minimizes disturbance resulting in a Soil Tillage Intensity Rating (STIR) less than 10 and reduces soil erosion from water or wind to below soil tolerance (T) level. The current NRCS wind and water erosion prediction technologies must be used to document the rotation, soil erosion estimate, and STIR calculations. *This enhancement is limited to acres where the conversion event took place not more than 2 years prior. Enhancement not applicable on hayland.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $346.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E328D - Leave standing grain crops unharvested to benefit wildlife

Scenario: #1 - Unharvested Grain Crops

Scenario Description:
Implement a crop rotation which allows a portion of grain crops to be left in fields un-harvested to provide food and cover for wildlife during winter months.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $213.61

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.34

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E328E - Soil health crop rotation

Scenario: #1 - Increase Diversity for Soil Health

Scenario Description:

Implement a crop rotation which addresses all four principle components of soil health: increases diversity of the cropping system; maintains residue throughout the year; keeps a living root; and minimizes soil chemical, physical and biological disturbance. The rotation will include at least 4 different crop and/or cover crop types (crop types include cool season grass, warm season grass, cool season broadleaf, warm season broadleaf) grown in a sequence that will produce a positive trend in the Organic Matter (OM) sub factor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $576.95

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.77

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E328F - Modifications to improve soil health and increase soil organic matter

Scenario: #1 - Soil Health Adaptive Management

Scenario Description:

Use of soil health assessment to evaluate impact of current conservation crop rotation in addressing soil organic matter depletion (primary assessment made in Year 1). Modifications to the crop rotation and/or crop management will be made as a result of the assessment results (adding a new crop and/or cover crop to the rotation; making changes to planting and/or tillage system, harvest timing of crops, or termination timing of cover crops). During Year 3 a follow up assessment will be completed to allow time for the modifications to show increased soil organic matter. Modified system must produce a positive trend in the Organic Matter (OM) sub factor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $252.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E328G - Crop rotation on recently converted CRP grass/legume cover for soil organic matter improvement

Scenario: #1 - Manage Soil Organic Matter

Scenario Description:
Crop rotation on acres converted, no more than 2 years prior, from CRP grass/legume cover to annual crops. Diverse rotation with living roots and residue cover throughout year and minimal disturbance. Enhancement not applicable on hayland.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $576.95

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.77

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E328H - Conservation crop rotation to reduce the concentration of salts

Scenario: #1 - Reduction of Salts, Saline Seeps

Scenario Description:

Implement a crop rotation to reduce the concentration of salts and other chemicals from saline seeps. The rotation should include at least 3 crops and/or cover crops grown in a sequence in the recharge areas of saline seeps that have rooting depths and water requirements adequate to fully utilize all available soil water. Do not use summer fallow. Use an approved water balance procedure to determine crop selection and sequence. Select crops with a tolerance to salinity levels that match the salinity of the discharge area. (See state lists)

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $461.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E328J - Improved crop rotation to provide benefits to pollinators

Scenario: #1 - Pollinator Friendly Crops

Scenario Description:

Improve the existing crop rotation by adding pollinator friendly crops into the rotation. The crop rotation shall include a minimum of three different crops in a minimum five year crop rotation. Each year, the pollinator friendly crop will be planted on a minimum of 5% of cropland acres contained within the agricultural operation. Use of insecticides is limited for the pollinator friendly crop.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acres planted to pollinator r

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $461.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $92.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E328K - Multiple crop types to benefit wildlife

Scenario: #2 - Multiple Crop Types

Scenario Description:
Alternating crops in a systematic arrangement of strips across a field to provide diverse rotations of crops that provide wildlife food. At least two crops will be planted in adjacent strips a minimum of 0.5 acres in size.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 328 - Conservation Crop Rotation.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 328 - Conservation Crop Rotation.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $115.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.77

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E328L - Leaving tall crop residue for wildlife

Scenario: #2 - Crop Residue for Habitat

Scenario Description:
Fields may be harvested but must leave crop residue standing a minimum of 14 inches. Residue will be left through winter and into spring, providing valuable winter cover and forage for wildlife spanning late summer and through the following winter.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

Feature Measure: acres with small grain stubbl

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $461.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11.54

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E328M - Diversify crop rotation with canola or sunflower to provide benefits to pollinators

Scenario: #18 - Add Canola or Sunflower for Pollinators

Scenario Description:
Diversify the existing crop rotation by adding canola or sunflower into the rotation. Canola or sunflower must be planted on a minimum of 5% of cropland acres. Pesticide use is limited to pre-bloom or bloom and in accordance with IPM and industry best management practices.

Before Situation:
Resources are protected at the minimum level for the Conservation Practice Standard (CPS) 328- Conservation Crop Rotation.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328-Conservation Crop Rotation

Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $461.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11.54

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E328P - Low Nitrogen Requirement Annual Crop Rotation

Scenario: #2 - Low Nitrogen Substitute

Scenario Description:
Design an annual crop rotation which less than the average annual nitrogen fertilizer requirement compared to the current (benchmark) crop rotation.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,974.06

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $29.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E329A - No till to reduce soil erosion

Scenario: #1 - No-Till, Soil Erosion

Scenario Description:

Establish no till system to reduce sheet and rill erosion soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $346.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E329B - No till to reduce tillage induced particulate matter

Scenario: #1 - No-Till, Particulate Matter

Scenario Description:

Establish no till system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $346.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E329C - No till to increase plant-available moisture

Scenario: #1 - No-Till, Moisture

Scenario Description:

Establish a no till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $346.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E329D - No till system to increase soil health and soil organic matter content

Scenario: #1 - No-Till, Soil Health and Organic Matter

Scenario Description:

Establish a no till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $461.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E329E - No till to reduce energy

Scenario: #1 - No-Till, Energy

Scenario Description:

Establish a no till system which reduces total energy consumption associated with field operations by at least 25% compared to current tillage system (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $461.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E329F - No-till into green cover crop to improve soil organic matter quantity and quality

Scenario: #2 - Planting Green

Scenario Description:

This scenario applies to cropland where residue and tillage management prepares the field for “planting green” techniques where cash crops are planted into living cover crop residues. This practice is based on economic and social data obtained from the North Jersey RC&D On-Farm Trials Soil Health Demo CIG Project results. This scenario involves the site preparation and management of live cover crop residues during no-till planting events. The practice will be used to drastically reduce soil erosion, reduce CO2 losses from the field, maximize the four principles of soil health and related resource concerns, mitigate pesticide usage and amplify the benefits of supporting practices. The typical scenario size is 100 acres.

Before Situation:

Row crops or small grains are grown and harvested. Cover crop and/or crop residues that are present are too fragile or not in a quantity to adequately address soil, water, and air resource concerns. Residues are dead at the time of planting, leaving soils

After Situation:

Live residues are maintained for extended periods of time in the spring, providing soil coverage that is adequate to control erosion and runoff and sedimentation. Soils are no-tilled and cover crop residues accumulate carbon providing carbon sequestration benefits as well as increasing soil microbial activity which further increase the function of the soil. Chemical inputs are generally reduced due to increased soil function and protection from live residues. Producers gain knowledge through workshops and working with crop consultants to maintain the success and long-term adoption of the practice. All cover crop residues are to be maintained on the surface until planting. The cover crop must be terminated before crop emergence. See complete “NRCS Cover Crop Termination Guidelines” for more information.

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $6,273.07

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $62.73

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E334A - Controlled traffic farming to reduce compaction

Scenario: #1 - Compaction Reduction

Scenario Description:

Establish a controlled traffic system where no more than 25% of the surface is tracked with heavy axel loads to minimize soil compaction. For row crops (e.g. corn in 30-inch rows) no tire should run on a row except for flotation tires on combines and/or fertilizer and lime spreading trucks. If wide flotation tires are used, they must be big enough that the inflation pressure will be below 18 psi to minimize compaction on trafficked rows.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 334 - Controlled Traffic Farming

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 334 - Controlled Traffic Farming

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $857.23

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $8.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E338A - Strategically planned, patch burning for grazing distribution and wildlife habitat

Scenario: #1 - Patch Burning

Scenario Description:

Patch burn grazing is the application of prescribed fires on portions of an identified grazing unit at different times of the year. Patch burn grazing allows grazing animals to select where they want to graze creating a mosaic of vegetation structures and diversity that will maintain or enhance the wildlife habitat desired for the identified wildlife species and maintain livestock production.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 338 - Prescribed Burning

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 338 - Prescribed Burning

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $796.96

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7.97

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E338B - Short-interval burns to promote a healthy herbaceous plant community

Scenario: #1 - Short-Interval Burns

Scenario Description:

The controlled use of fire is applied in a forest to restore fire-adapted plants while improving wildlife habitat, wildlife food supply, and reducing the risk of damage from intense, severe wildfires. The ideal interval between prescribed burns is not often achieved. To improve the effectiveness of prescribed burning, the frequency of prescribed burning is increased appropriately, for a specified time period, to help restore ecological conditions in forests and woodlands. Short return interval prescribed burning is used to regenerate desirable tree species, improve the condition of fire-adapted plants and native herbaceous vegetation, improve wildlife food supply, create wildlife habitat (snags and den/cavity trees), limit encroachment of competing vegetation including non-native species, and reduce the future risk of damage from intense, severe wildfires.

Before Situation:

The site has a mixture of woody sprouts and some herbaceous vegetation in the forest understory.

After Situation:

The site has a mixture of warm season perennial vegetation and cool-season annual forages. Grazing is occurring to manage the herbaceous vegetation and keep undesirable woody vegetation from occupying the forest understory.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $4,925.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $123.15

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E338C - Sequential patch burning

Scenario: #1 - Patch Burning, Sequential

Scenario Description:

Conduct prescribed under burning beneath a forest canopy (ground fire), burning a portion of the area each year to create a mosaic of vegetation in several stages of development, to provide a more diverse understory and contribute to wildlife habitat. The health of conifer and oak-conifer forests, particularly longleaf pine with a characteristic herbaceous understory, is dependent on fire or another means of controlling encroaching woody vegetation. A healthy longleaf or shortleaf pine, or pine-oak forest, can support a wide array of wildlife including pollinators and several endangered or threatened species.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 338 - Prescribed Burning

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 338 - Prescribed Burning

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,781.33

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $278.13

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E340A - Cover crop to reduce soil erosion

Scenario: #1 - Soil Erosion Reduction

Scenario Description:

Cover crop added to current crop rotation to reduce soil erosion from water and wind to below soil tolerance (T) level. Cover crops grown during critical erosion period(s). Species are selected that will have physical characteristics to provide adequate erosion protection.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $941.51

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9.42

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E340B - Intensive cover cropping to increase soil health and soil organic matter content

Scenario: #1 - Cover Crop, Intensive

Scenario Description:

Implementation of cover crop mix to provide soil coverage during ALL non-crop production periods in an annual crop rotation. Cover crop shall not be harvested or burned. Planned crop rotation including cover crops and associated management activities must achieve a soil conditioning index (SCI) of zero or higher. The current NRCS wind and water erosion prediction technologies must be used to document SCI calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,533.98

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $15.34

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E340C - Use of multi-species cover crops to improve soil health and increase soil organic matter

Scenario: #1 - Diversify Multi-Species

Scenario Description:

Implement a multi-species cover crop to add diversity and increase biomass production to improve soil health and increase soil organic matter. Cover crop mix must include a minimum of 4 different species. The cover crop mix will increase diversity of the crop rotation by including crop types currently missing, e.g. Cool Season Grass (CSG), Cool Season Broadleaves (CSB), Warm Season Grasses (WSG), Warm Season Broadleaves (WSB).

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,369.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E340D - Intensive orchard/vineyard floor cover cropping to increase soil health

Scenario: #1 - Orchard and Vineyard, Soil Health

Scenario Description:
Implement orchard or vineyard floor cover crops. Cover crop shall not be harvested, grazed, or burned. Must achieve a soil conditioning index of zero or higher and produce a positive trend in the Organic Matter subfactor over the life of the rotation.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,369.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E340E - Use of soil health assessment to assist with development of cover crop mix to improve soil health

Scenario: #1 - Soil Health Assessment

Scenario Description:
Soil health assessment (year 1) to evaluate current crop rotation in addressing soil organic matter depletion. Results are utilized to select a multi-species cover crop mix to add to the current crop rotation. Follow up assessment completed (year 3).

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $350.59

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.51

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E340F - Cover crop to minimize soil compaction

Scenario: #1 - Soil Compaction Treatment

Scenario Description:

Establish a cover crop mix that includes plants with both fibrous root and deep rooted systems. Fibrous to treat and prevent both near surface (0-4”) and deep (>4”) soil compaction and deep rooted to break up deep compacted soils. Cover crop shall not be harvested, grazed, or burned.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,336.51

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13.37

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E340G - Cover crop to reduce water quality degradation by utilizing excess soil nutrients

Scenario: #1 - Scavenge Excess Soil Nutrients

Scenario Description:

Establish a cover crop mix to take up excess soil nutrients. Select cover crop species for their ability to effectively utilize nutrients. Terminate the cover crop as late as practical to maximize plant biomass production and nutrient uptake. Cover crop shall not be harvested, grazed, or burned.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,336.51

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13.37

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E340H - Cover crop to suppress excessive weed pressures and break pest cycles

Scenario: #1 - Weed and Pest Suppression

Scenario Description:

Establish a cover crop mix to suppress excessive weed pressures and break pest cycles. Select cover crop species for their life cycles, growth habits, and other biological, chemical and/or physical characteristics. Select cover crop species that do not harbor pests or diseases of subsequent crops in the rotation. Cover crop shall not be harvested, grazed, or burned.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,369.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E340I - Using cover crops for biological strip till

Scenario: #2 - Bio-Strip Tillage

Scenario Description:
Establish alternating strips of cover crops in which one strip acts as a biological strip-tiller and the adjacent strip promotes soil health with high residue cover crops. This will facilitate planting of the subsequent cash crop into the biologically strip-tilled row without the need for mechanical disturbance.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 340 - Cover Crop.

After Situation:
The adoption of this enhancement will provide protection above the minimum level as described in Conservation Practice Standard 340 - Cover Crop.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,469.77

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $14.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E345A - Reduced tillage to reduce soil erosion

Scenario: #1 - Reduced Tillage, Soil Erosion

Scenario Description:

Establish a reduced tillage system to reduce soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $461.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E345B - Reduced tillage to reduce tillage induced particulate matter

Scenario: #1 - Reduced Tillage, Particulate Matter

Scenario Description:

Establish a reduced tillage system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $346.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E345C - Reduced tillage to increase plant-available moisture

Scenario: #1 - Reduced Tillage, Moisture

Scenario Description:

Establish a reduced till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $346.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E345D - Reduced tillage to increase soil health and soil organic matter content

Scenario: #1 - Reduced Tillage, Soil Health and Organic Matter

Scenario Description:

Establish a reduced till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher and produce a positive trend in the Organic Matter (OM) subfactor over the life of the crop rotation. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $461.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.62

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E345E - Reduced tillage to reduce energy use

Scenario: #1 - Reduced Tillage, Energy

Scenario Description:

Establish a reduced tillage system which reduces total energy consumption associated with field operations by at least 25% compared to conventional tillage systems (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $346.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E373A - Dust suppressant re-application for stabilization

Scenario: #18 - Dust Suppression, One Application

Scenario Description:
Limit dust emissions by maintaining the surfaces of unpaved roads and areas in a stabilized condition. The periodic re-application of dust suppressants to unpaved surface areas will limit dust generation from vehicle and machinery activities or wind action.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 373 - Dust Control on Unpaved Roads and Surfaces.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 373 - Dust Control on Unpaved Roads and Surfaces.

Feature Measure: Square Feet

Scenario Unit: Square Foot

Scenario Typical Size: 15,840.0

Scenario Total Cost: $4,361.85

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.28

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E376A - Modify field operations to reduce particulate matter

Scenario: #1 - Manage Soil Disturbance

Scenario Description:
Modify tillage and/or harvest operations to reduce particulates by at least 20 percent below the required levels.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 376 - Field Operations Emissions Reduction

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 376 - Field Operations Emissions Reduction

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $346.17

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E381A - Silvestre to improve wildlife habitat

Scenario: #1 - Silvestre for Wildlife

Scenario Description:
Establishing a combination of trees or shrubs and compatible forages on the same acreage, providing forage, shade, and/or shelter for livestock that include a purpose of enhancing wildlife cover and shelter.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 381 - Silvestre

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 381 - Silvestre

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $9,220.09

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $92.20

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E382A - Incorporating "wildlife friendly" fencing for connectivity of wildlife food resources

Scenario: #1 - Wildlife Friendly Fence

Scenario Description:
Retrofitting or constructing fences that provide a means to control movement of animals, people, and vehicles, but minimizes wildlife movement impacts.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 382 - Fence

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 382 - Fence

Feature Measure: Acre

Scenario Unit: Foot

Scenario Typical Size: 1,000.0

Scenario Total Cost: $240.61

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.24

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E382B - Installing electrical fence offsets and wire for cross-fencing to improve grazing management

Scenario: #2 - Cross-Fencing, Electric

Scenario Description:
Retrofitting conventional fences such as barb wire, with new electrical offsets and electrical wire to facilitate cross-fencing for improved grazing management.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 382 - Fence

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 382 - Fence

Feature Measure: Feet

Scenario Unit: Foot

Scenario Typical Size: 2,640.0

Scenario Total Cost: $1,394.59

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.53

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E383A - Grazing-maintained fuel break to reduce the risk of fire

Scenario: #1 - Fuel Break Management

Scenario Description:

The area has existing fuel break(s) of 30 to 60 feet in width, supporting a mixture of woody sprouts and some herbaceous vegetation. Warm-season perennial vegetation will be established on the fuel breaks, and will be over-seeded with cool-season annual forages in the fall. Grazing will be managed on the fuel breaks to remove or modify the fine fuel vegetation, thus reducing the risk of fire spread from ground fires. Ground cover will be maintained to control soil erosion and facilitate prescribed burning.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 383 - Fuel Break

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 383 - Fuel Break

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $3,162.18

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $316.22

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E384A - Biochar production from woody residue

Scenario: #3 - Biochar Production

Scenario Description:

The adoption of this enhancement will go above the minimum level of woody residue treatment by creating a product that improves air quality by storing carbon, decreases fuel loads and fire hazard, and can improves soil quality. It will utilize woody debris remaining after a silvicultural practice or natural disturbance to create biochar. Biochar stores carbon and is a useful soil amendment that improves SOM and water-holding capacity.

Before Situation:

Area has woody residue that is unmerchantable and available for creation of quality biochar. Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 384 - Woody Residue Treatment

After Situation:

Woody debris has been converted to biochar.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 2.5

Scenario Total Cost: $13,342.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5,336.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E386A - Enhanced field borders to reduce soil erosion along the edge(s) of a field

Scenario: #1 - Soil Erosion Reduction, Edges

Scenario Description:
Enhance existing field borders to a width of at least 30 feet and establish a single species or mixture of species that provide a dense ground cover along the edge(s) of the field.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,268.11

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,268.11

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E386B - Enhanced field borders to increase carbon storage along the edge(s) of the field

Scenario: #1 - Carbon Storage

Scenario Description:
Enhance existing field borders to a width of at least 30 feet and establish a single species or mixture of species that provide a dense ground cover and dense rooting system along the edge(s) of the field.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,377.87

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,377.87

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E386C - Enhanced field borders to decrease particulate emissions along the edge(s) of the field

Scenario: #1 - Particulate Emissions Reduction

Scenario Description:
Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that decrease the particulate emissions along the edge(s) of the field.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,290.77

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,290.77

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E386D - Enhanced field borders to increase food for pollinators along the edge(s) of a field

Scenario: #1 - Pollinators

Scenario Description:
Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that provide food for pollinators along the edge(s) of the field.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,377.87

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,377.87

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E386E - Enhanced field borders to increase wildlife food and habitat along the edge(s) of a field

Scenario: #1 - Wildlife Habitat

Scenario Description:
Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that provide wildlife food and habitat along the edge(s) of the field. The extended field border will also provide enhanced wildlife habitat continuity.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,377.87 *Based on Tennessee average costs. Individual county costs may vary.*

Total Cost per Unit: $1,377.87

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E390A - Increase riparian herbaceous cover width for sediment and nutrient reduction

Scenario: #1 - Riparian Herbaceous Cover Expansion

Scenario Description:
Where an existing herbaceous riparian buffer is located along a river, stream, pond, lake, or other waterbody, increase the width of the buffer in order to allow a greater percentage of sediment and nutrient removal from surface and subsurface flows.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $1,291.37

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $645.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E390B - Increase riparian herbaceous cover width to enhance wildlife habitat

Scenario: #1 - Riparian Herbaceous Cover Expansion, Wildlife

Scenario Description:

Where an existing herbaceous riparian buffer is located along a river, stream, pond, lake, or other waterbody, increase the diversity of native species, control invasive species, install fencing and relocate equipment operations, trails, and livestock, and increase the width of the buffer.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 4.0

Scenario Total Cost: $1,758.55

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $439.64

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E391A - Increase riparian forest buffer width for sediment and nutrient reduction

Scenario: #1 - Riparian Forest Buffer Expansion

Scenario Description:
Where an existing forested riparian area is located along a river, stream, pond, lake, or other waterbody, increase the width of the buffer in order to allow a greater percentage of sediment and nutrient removal from surface and subsurface flows.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $4,776.85

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,388.43

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E391B - Increase stream shading for stream temperature reduction

Scenario: #1 - Increase Tree Canopy Cover for Shading

Scenario Description:
Riparian area tree canopy cover density is increased and the extent of the forested riparian area is increased to provide greater stream shading.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $4,832.91

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,416.45

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E391C - Increase riparian forest buffer width to enhance wildlife habitat

Scenario: #1 - Riparian Forest Buffer Expansion, Wildlife

Scenario Description:

Where an existing riparian forest buffer is located along a river, stream, pond, lake, or other waterbody, increase the diversity of native species, control invasive species, install fencing and relocate equipment operations, trails, and livestock to increase the functional width of the buffer.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $4,832.91

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,416.45

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E393A - Extend existing filter strip to reduce water quality impacts

Scenario: #1 - Filter Strip Expansion

Scenario Description:

Extend existing filter strips for water quality protection. Extend the existing buffer for a total of 60 feet or more to enhance water quality functions. The extended buffers must be composed of at least 5 species of non-noxious, wildlife friendly grasses and/or perennial forbs best suited to site conditions. Include species that provide pollinator food and habitat where possible.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 393 - Filter Strip

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 393 - Filter Strip

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,608.66

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,608.66

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E395A - Stream habitat improvement through placement of woody biomass

Scenario: #1 - Woody Biomass Placement

Scenario Description:
Flexible placement of wood (unanchored/unpinned) in small, 1st and 2nd order streams to improve stream habitat conditions for aquatic species and natural stream processes.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 395 - Stream Habitat Improvement and Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 395 - Stream Habitat Improvement and Management

Feature Measure: Bankfull width X Length

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $22,334.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $22,334.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E399A - Fishpond management for native aquatic and terrestrial species

Scenario: #1 - Fishpond Management

Scenario Description:
Pond rehabilitation, buffer, and watershed management actions are taken to improve habitat for native species of fish, amphibians, and shorebirds.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 399 - Fishpond Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 399 - Fishpond Management

Feature Measure: Pond area + buffer area

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $3,233.08

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,616.54

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E412A - Enhance a grassed waterway

Scenario: #2 - Waterway Expansion

Scenario Description:

Typical practice is 1500 ' long, 12' bottom, 8:1 side slopes, 1.1' depth. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding will be completed under the Critical Area Planting (342) Practice Standard with seeding area up to 20% greater than waterway area to account for buffer area along the waterway. Costs include excavation and associated work to construct the overall shape and grade of the waterway. This scenario would apply to Grassed Waterways without erosion control blanket or rock checks.

Before Situation:

The field has a grassed waterway, but a gully cutting upstream, downstream, or adjacent to the existing grassed waterway has formed as time goes on, so the new gully needs to be stopped or controlled. The new gully has formed in field as a result of a cha

After Situation:

An installed grassed waterway has been installed that is possibly wider or longer than the original grassed waterway that wasn't functioning properly anymore. The new installed grassed waterway is 1500 ' long, 12' bottom, 8:1 side slopes, 1.1' depth. The practice is installed using a dozer and/or scraper, with final grading with motor grader. Use Critical Area Planting (342) for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606).

Feature Measure: Acres of Waterway reshape

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $4,064.36

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,064.36

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E420A - Establish pollinator habitat

Scenario: #2 - Establish Pollinator Habitat

Scenario Description:
Seed or plug nectar and pollen producing plants in non-cropped areas such as field borders, vegetative barriers, contour buffer strips, shelterbelts, hedgerows, windbreaks, conservation cover, and riparian forest and herbaceous buffers.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost:	$633.12	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$633.12	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E420B - Establish monarch butterfly habitat

Scenario: #2 - Enhanced Plantings for Monarch Habitat

Scenario Description:
Seed or plug milkweed (Asclepias spp.) and high-value monarch butterfly nectar plants on marginal cropland, field borders, contour buffer strips and similar areas.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting.

After Situation:
Adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $994.83

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $994.83

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E447A - Advanced Tailwater Recovery

Scenario: #2 - Tailwater Recovery

Scenario Description:

This enhancement is for a recovery system that capture 100% of excess irrigation and drainage runoff water from the contiguous land where the activity is implemented. Runoff water is conveyed through properly designed recovery ditches to a storage structure. Each recovery ditch and storage structure have adequate capacity to store excess irrigation water and reasonable runoff water. The system is designed to incorporate the collected water back into the delivery system so that excess water is reused. The system is fully automated to operate the recovery pumps, valves, and collection system. Key elements in the system are sensors that can evaluate data and operate devices through the system in opening/closing or on /off based on scientifically determined parameters.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 447 - Irrigation System, Tailwater Recovery.

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 447 - Irrigation System, Tailwater Recovery.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 200.0

Scenario Total Cost: $1,851.57

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E449A - Complete pumping plant evaluation for water savings

Scenario: #1 - Pumping Plant Evaluation, Water Efficiency

Scenario Description:

The performance of pump tests and evaluations of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to improve water delivery efficiency 10% or more. Develop and provide a written report with recordkeeping documents and list of adjustments and calculations of the reduction of water use based on before and after conditions.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 – Irrigation Water Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard, (CPS) 449 – Irrigation Water Management.

Feature Measure: Each pump evaluated

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,157.60

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,157.60

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E449B - Alternated Wetting and Drying (AWD) of rice fields

Scenario: #1 - Alternate Wetting and Drying

Scenario Description:
Rice fields are drained and allowed to “dry down” to a saturated soil condition prior to re-flooding the field. System is installed in year 1 with Scenario E449144Z8 and this scenario used in years 2-5.

Before Situation:
Resources are protected at the minimum level of the conservation Practice Standard (CPS) 449 – Irrigation Water Management.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard (CPS) 449 – Irrigation Water Management.

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $1,441.05

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $36.03

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E449C - Advanced Automated IWM - Year 2-5, soil moisture monitoring

Scenario: #1 - Years Two-Five, Soil Moisture Monitoring

Scenario Description:
Advanced automated irrigation water management using soil moisture or water level monitoring (installed as per IWM plan) with data loggers.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 – Irrigation Water Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 125.0

Scenario Total Cost: $2,612.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $20.90

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E449D - Advanced Automated IWM - Year 1, Equipment and soil moisture or water level monitoring

Scenario: #1 - Year One, Equipment, Advanced Soil Moisture or Water Monitoring

Scenario Description:
Installing and monitoring soil moisture or water leveling equipment for advanced automated irrigation water management

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 120.0

Scenario Total Cost: $7,693.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $64.11

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E449E - Convert from Cascade to Furrow Irrigated Rice Production – reduce irrigation water consumption

Scenario: #2 - Cascade to Furrow Irrigation Conversion

Scenario Description:
Field currently flooded through a cascade levee system will be converted to furrow irrigation.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 449 - Irrigation Water Management.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 449 - Irrigation Water Management.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 80.0

Scenario Total Cost: $5,001.89

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $62.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E449F - Intermediate IWM - Year 1, Equipment with Soil or Water Level monitoring

Scenario: #2 - Year One, Equipment, Intermediate Soil Moisture or Water Monitoring

Scenario Description:
This activity involves monitoring soil moisture or water levels within a irrigated field for intermediate irrigation water management include installation of equipment year 1.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 160.0

Scenario Total Cost: $8,004.53

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $50.03

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E449G - Intermediate IWM - Years 2-5, Soil or Water Level monitoring

Scenario: #2 - Years Two-Five, Data Collection

Scenario Description:

Intermediate irrigation water management involves monitoring soil moisture or water levels within an irrigated field by utilizing technological equipment to gather field specific data concerning weather, soil moisture or water levels throughout the irrigation season. The equipment was bought in year one and is utilized to log data through the season to be retrieved periodically so irrigation decisions can be made based on scientific data. Maximum time between data retrieval is weekly.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 160.0

Scenario Total Cost: $1,566.15

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $9.79

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E449H - Intermediate IWM - Years 2 -5, using soil moisture or water level monitoring

Scenario: #18 - Years Two-Five, Interpretation of Data Log

Scenario Description:
Intermediate irrigation water management using soil moisture or water level monitoring with data loggers; specifically, multi-depth soil moisture sensors, water well and relift permanent flow meters, twice-daily water stage imaging water level devices, and quarter hour climate data element recording weather stations at approved IWM plan locations.

Before Situation:
Resources are protected at the minimum level of the CPS 449 - Irrigation Water Management.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $2,132.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $53.32

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E449I - Sprinkler Irrigation Equipment Retrofit

Scenario: #18 - Year One, Retrofit Equipment with Speed Control

Scenario Description:

This activity involves installing speed control equipment to a sprinkler irrigated field for irrigation water management. The installation of the equipment is in year one. It is applicable to sprinkler irrigation systems that do not already have the functionality and are able to integrate the speed control technology.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,026.69

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,026.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E449J - Intermediate IWM – 20% Reducing Water Usage

Scenario: #2 - Irrigation Water Management, 20 Percent Reduction

Scenario Description:

Intermediate irrigation water management involves monitoring soil moisture or water levels within an irrigated field by utilizing technological equipment to gather field specific data concerning weather, soil moisture or water levels throughout the irrigation season. The equipment will be utilized to log data through the season to be retrieved periodically so irrigation decisions can be made based on scientific data. Maximum time between data retrieval is weekly. Monitoring will be for the entire irrigation season and data gathered will be used to make sound decisions on irrigation water use. Supplemental Water usage will be reduced by 20% from previous years use and remain at that level for the remainder of the contract.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 – Irrigation Water Management.

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard (CPS) 449 – Irrigation Water Management.

Feature Measure: Irrigated Acres

Scenario Unit: Acre

Scenario Typical Size: 125.0

Scenario Total Cost: $4,812.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $38.50

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E472A - Manage livestock access to waterbodies to reduce nutrients or pathogens to surface water

Scenario: #1 - Manage Livestock Access

Scenario Description:
Installation of structures and implementation of grazing management actions that restrict livestock access to streams, ditches, and other waterbodies in order to reduce nutrient loading or reduce the introduction of pathogens from manure, bio-solids or compost to surface waters.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 472 - Access Control

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 472 - Access Control

Feature Measure: (Stream length protected *

Scenario Unit: Foot

Scenario Typical Size: 1,320.0

Scenario Total Cost: $4,114.84

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E484A - Mulching to improve soil health

Scenario: #1 - Improve Soil Health

Scenario Description:

Implement a crop rotation which utilizes mulch and addresses all four principle components of soil health: increases diversity of the cropping system; maintains residue throughout the year; keeps a living root; and minimizes soil chemical, physical and biological disturbance. Plant-based mulching materials will be applied at least once during the rotation. The rotation will include at least 4 different crops and/or cover crops grown in a sequence that will produce a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 484 - Mulching

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 484 - Mulching

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $230.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.31

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E484B - Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch

Scenario: #1 - Woody Mulch, Orchard and Vineyard

Scenario Description:

Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch. At least 90% of all woody materials are to be used as mulch on the operation. An exception may be made when it is determined that infected material must be burned to preserve crop health.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 484 – Mulching

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 484 - Mulching

Feature Measure: Actual Acres of Crop produc

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $685.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $17.14

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E484C - Mulching with natural materials in specialty crops for weed control

Scenario: #2 - Specialty Crop

Scenario Description:
Application of straw mulch or other state approved natural material (such as wood chips, compost, green chop, dry hay or sawdust) for weed control in specialty crops.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 484 - Mulching

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 484 - Mulching

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $620.47

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $62.05

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E511A - Harvest of crops (hay or small grains) using measures that allow desired species to flush or escape

Scenario: #1 - Wildlife Friendly Harvest

Scenario Description:

Harvest of crops (hay or small grains) using conservation measures that allow desired species to flush or escape. (For species list see State Wildlife Action Plan) Conservation measures include timing of harvest, idling land during the nesting or fawning period, and applying harvest techniques that reduce mortality to wildlife.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 511 - Forage Harvest Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 511 - Forage Harvest Management

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $216.11

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.32

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E511B - Forage harvest management that helps maintain wildlife habitat cover, shelter or continuity

Scenario: #1 - Manage Harvest for Wildlife Habitat

Scenario Description:
The timely cutting and removal of forages from the field as hay, green-chop, or ensilage in such a way, and in time frames, to optimize both forage yield/quality and wildlife cover and shelter and/or continuity between otherwise disconnected habitats.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 511 - Forage Harvest Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 511 - Forage Harvest Management

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $564.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $5.64

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E511C - Forage testing for improved harvesting methods and hay quality

Scenario: #2 - Manage Harvest for Forage Quality

Scenario Description:

This enhancement results in participants obtaining hay samples and submitting them to a land grant university or other accredited lab for quality analysis. The participant will record data for multiple harvests and use the data to make future decisions. The participant will discuss the results with NRCS or with their cooperative extensions service. Technical recommendations are made to the participant based upon the test results.

Before Situation:

The participant has hay that doesn't have quality analysis or doesn't know the quality of previous hay harvests. The hay will be fed when needed.

After Situation:

The participant has hay with hay quality analysis. The participant records data based upon the results to reference and make future decisions. The participant has a better understanding on the quality of hay so that adjustments in feeding or supplementation can be made.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 2.0

Scenario Total Cost: $294.06

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $147.03

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E511D - Forage Harvest Management to Improve Terrestrial Habitat for Wildlife during Over-Winter Periods

Scenario: #2 - Delay or Forgo Harvest

Scenario Description:

Eliminate or forgo the last fall cutting of hay or haylage to optimize wildlife cover and shelter during critical over-winter periods and lengthen late season bloom period for invertebrates. Allowing late season stand maturity increases stand life and reduces risks of frost and winter damage while providing valuable wildlife habitat and an extended bloom periods.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 511-Forage Harvest Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in CPS - 511

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $1,155.36

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $28.88

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E512B - Forage and biomass planting to reduce soil erosion or increase organic matter to build soil health

Scenario: #1 - Build Soil Health

Scenario Description:
Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can provide for reduced soil erosion, improving soil health.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Pasture and Hay Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Pasture and Hay Planting

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $3,242.20

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $162.11

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E512D - Forage plantings that help increase organic matter in depleted soils

Scenario: #1 - Increase Organic Matter

Scenario Description:
Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can help improve soil quality of depleted sites through increase or conservation of the organic matter in the soil.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Pasture and Hay Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Pasture and Hay Planting

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $1,674.54

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $83.73

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E512I - Establish pollinator and/or beneficial insect and/or monarch habitat

Scenario: #1 - Improve Habitat for Wildlife, Pollinators, Beneficial Insects and Monarchs

Scenario Description:

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species that can provide nectar for Monarch butterflies and/or pollinators and forage and other habitat values for wildlife and livestock, particularly at times when targeted nectar, forage supply and quality, cover, and shelter are not available in other pastures.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Pasture and Hay Planting

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Pasture and Hay Planting

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $3,537.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $176.89

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E512J - Establish wildlife corridors to provide habitat continuity or access to water

Scenario: #1 - Wildlife Corridors

Scenario Description:
Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that can provide cover needed for wildlife species of concern to move from food/cover/water sources to other food/cover/water sources as needed for their life cycles, and/or to enhance the utility of underused wildlife habitat areas.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Pasture and Hay Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Pasture and Hay Planting

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $2,238.44

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $111.92

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E512L - Diversifying Forage Base with Interseeding Forbs and Legumes to Increase Pasture Quality

Scenario: #2 - Interseed Forbs and Legumes

Scenario Description:
Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that increases the diversity to enhance livestock, forage supply and quality, not available in other pastures

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 Pasture and Hay Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard (CPS) 512 Pasture and Hay Planting

Feature Measure: acres treated

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $2,184.95

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $109.25

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E512M - Forage Plantings that Improve Wildlife Habitat Cover and Shelter or Structure and Composition

Scenario: #2 - Manage Wildlife Habitat Cover

Scenario Description:
Establishing native adapted and/or compatible species, varieties, or cultivars of herbaceous species for pasture, hay, or biomass production that provide cover and shelter or structure and composition for wildlife.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 Pasture and Hay Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard (CPS) 512 Pasture and Hay Planting

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $7,939.55

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $396.98

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528A - Maintaining quantity and quality of forage for animal health and productivity

Scenario: #1 - Manage Grazing

Scenario Description:

Managing the harvest of vegetation with grazing and/or browsing animals for the purposes of maintaining desired pasture composition/plant vigor and improving/maintaining quantity and quality of forage for the animals' health and productivity following the recommendations of a qualifying professional, as detailed in the documentation and implementation requirements.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1,000.0

Scenario Total Cost: $4,249.43

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4.25

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528B - Grazing management that improves monarch butterfly habitat

Scenario: #1 - Improve Monarch Habitat

Scenario Description:
Implement a grazing management plan that will increase the abundance and diversity of monarch nectar-producing perennial forbs, including milkweed, while maintaining ecosystem benefits for other wildlife and livestock.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,063.59

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $10.64

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528C - Incorporating wildlife refuge areas in contingency plans for wildlife.

Scenario: #1 - Contingency Plans, Wildlife Refuge

Scenario Description:

A prescribed grazing plan that includes 12 month (or longer) rest (non-grazing period equal or greater than one year) of a grazing unit that consists of native grasses and/or legumes and/or perennial forbs for the purpose of meeting the needs for drought/disaster contingency plans that will also provide wildlife habitat or wildlife access to water for a period of time.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,852.07

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $18.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528D - Grazing management for improving quantity and quality of food or cover and shelter for wildlife

Scenario: #1 - Improve Wildlife Habitat

Scenario Description:
Grazing management employed will provide the plant structure, density and diversity needed for improving the quantity and quality of cover, shelter and food for the desired wildlife species of concern.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1,000.0

Scenario Total Cost: $652.58

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.65

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528E - Improved grazing management for enhanced plant structure and composition for wildlife

Scenario: #1 - Improve Structure and Composition for Wildlife Habitat

Scenario Description:
Managing the harvest of vegetation with grazing and/or browsing animals for the purpose of improving the quantity and quality of the structure and composition of the plant community that is available for wildlife.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $359.74

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $3.60

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528F - Stockpiling cool season forage to improve structure and composition or plant productivity and health

Scenario: #1 - Stockpile Forage

Scenario Description:
Grazing management employed to stop grazing events of selected paddock(s) to allow pasture forages to grow to maximum vegetative biomass accumulation before the end of the growing season.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $3,011.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $30.12

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528G - Improved grazing management on pasture for plant productivity and health with monitoring activities

Scenario: #1 - Monitor Pastureland Health

Scenario Description:
Managing the harvest of vegetation with grazing and/or browsing animals as adjusted when following recommendations of a qualifying professional, as detailed in the enhancement criteria, generated through pasture condition scoring (PCS).

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,100.53

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11.01

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528H - Prescribed grazing to improve/maintain riparian and watershed function-elevated water temperature

Scenario: #1 - Riparian Management, Water Temperature

Scenario Description:
Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1,000.0

Scenario Total Cost: $1,850.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.85

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528I - Grazing management that protects sensitive areas -surface or ground water from nutrients

Scenario: #1 - Protect Sensitive Areas

Scenario Description:
Grazing management employed will provide cover and density needed in the watershed in order to protect sensitive areas such as sinkholes, streams, highly erodible areas, or locations with plants that cannot tolerate defoliation.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1,000.0

Scenario Total Cost: $2,061.64

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.06

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528J - Prescribed grazing on pastureland that improves riparian and watershed function

Scenario: #1 - Riparian Management

Scenario Description:
Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,749.93

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $17.50

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528L - Prescribed grazing that improves or maintains riparian and watershed function-erosion

Scenario: #1 - Riparian Management, Erosion

Scenario Description:
Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,139.11

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528M - Grazing management that protects sensitive areas from gully erosion

Scenario: #1 - Gully Erosion Treatment

Scenario Description:
Grazing management employed will provide vegetative cover and density needed in the watershed in order to protect sensitive areas such as sinkholes, streams, highly erodible areas, or locations that cannot tolerate plant defoliation.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1,000.0

Scenario Total Cost: $1,869.04

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.87

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528N - Improved grazing management through monitoring activities

Scenario: #1 - Monitor Rangeland Health

Scenario Description:

Three predominant key grazing areas are evaluated utilizing the Rangeland Health Assessment (where reference material is developed) or Describing Indicators of Rangeland Health protocols (where reference material is not developed) to determine how well the ecological processes of the site(s) are functioning. Utilizing knowledge learned from this as a part of the ranch resource assessment, a qualifying professional, as detailed in the enhancement criteria, will provide recommendations or follow-up evaluations toward mitigating some of the degradation risks that are initially identified.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1,000.0

Scenario Total Cost: $2,162.49

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.16

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528O - Clipping mature forages to set back vegetative growth for improved forage quality

Scenario: #2 - Clipping, Mature Forages

Scenario Description:
Timely clipping of mature forages through mowing, swathing or some other mechanical cutting will occur to increase forage palatability by setting plants back to a vegetative state for improved grazing management and forage quality.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 80.0

Scenario Total Cost: $4,130.96

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $51.64

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528P - Implementing Bale or Swath Grazing to increase organic matter and reduce nutrients in surface water

Scenario: #2 - Bale or Swath Grazing

Scenario Description:

Bale or swath grazing to improve organic matter, aggregate stability or soil organism habitat or to reduce nutrient risks to surface water by leaving field harvested forages on site or supplementing with off-field forages. Grazing forages in this manner, will help reduce nutrient concentrations from confined animal lots while incorporating organic matter, feeding and diversifying the microbiome, building better soil aggregation and increasing soil health.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $3,821.82

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $191.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528Q - Use of body condition scoring for livestock on a monthly basis to keep track of herd health

Scenario: #2 - Body Condition Scoring

Scenario Description:

Body condition scoring (BCS) serves as a useful management tool to monitor livestock performance with respect to current and recent feeding or grazing programs. Body condition scoring is a numeric scoring system, producers can use to consistently evaluate animals' estimated body energy reserves through degree of fatness. This information can be used to adjust nutritional strategies to reach optimal BCS. Since body condition is closely associated with reproductive performance as well as feed efficiency, monitoring body condition can help producers reach production goals and increase the operation's bottom line. Knowledge and understanding of BCS will assist producers to adjust a supplemental feeding program to maintain animal health and nutrition on a-monthly-basis.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $255.36

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2.55

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528R - Management Intensive Rotational Grazing

Scenario: #2 - Management Intensive Rotational Grazing

Scenario Description:
Management intensive, multi-paddock grazing system where livestock are regularly and systematically moved to fresh forage to optimize quantity and quality of forage growth, improve manure distribution, improve wildlife cover, and improve soil health.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $4,550.26

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $45.50

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528S - Soil Health Improvements on Pasture

Scenario: #2 - Improve Pasture Condition

Scenario Description:

Use of soil health assessment to evaluate impact of current grazing system in addressing soil organic matter depletion, soil aggregate instability and soil organism habitat loss or degradation (primary assessment made in Year 1). Modifications to the grazing system will be made after the laboratory analysis. Modifications can be improvements to the grazing plan or changes to the forage composition. During year 4, a follow-up assessment will be completed to allow time for the modifications to show improvements to the soil health resource concerns. The follow-up sample will be taken in the same soil type, closely matched to time of year and with similar amounts of regrowth since previous grazing.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (PCS) 528 - Prescribed Grazing

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,260.50

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12.61

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E528T - Grazing to Reduce Wildfire Risk on Forests

Scenario: #2 - Reduce Wildfire Risks, Western Forests

Scenario Description:
Managing the harvest of vegetation with grazing and/or browsing animals for the purpose of balancing forage with maintaining/improving ecological site condition and while reducing the risk of wildfire hazard on forested ecological sites.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level with the addition of CPS 528 - Prescribed Grazing

Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $119.95

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.20

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E533A - Advanced Pumping Plant Automation

Scenario: #2 - Automation

Scenario Description:

This enhancement consists of installing a control device to a pump station that allows the user to remotely monitor and operate the pump station based on field measured data. Pumping stations may have either a combustible or electric power unit that are compatible with the control device or sensor. These devices/sensors collect field-measured data and provide this data in real time to the landowner to make irrigation decisions and adjustments to the pump operation.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 533 - Pumping Plant.

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 533 - Pumping Plant.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,319.38

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,319.38

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E533B - Complete pumping plant evaluation for energy savings

Scenario: #1 - Pumping Plant Evaluation, Energy

Scenario Description:

The performance of pump tests and evaluations of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to reduce energy use. Evaluate to determine if a Variable Frequency Drive motor controller(s) will reduce energy use and is feasible. Develop and provide a written report with list of adjustments and calculations of the reduction of energy use based on before and after conditions.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 533 - Pumping Plant

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 533 - Pumping Plant

Feature Measure: Each pump evaluated

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,157.60

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $4,157.60

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E533C - Install VFDs on pumping plants

Scenario: #12 - Variable Frequency Drive

Scenario Description:
Install Variable Frequency Drive(s) (VFD) on Pumping Plant with the correct sensors, on all pumps as indicated in the evaluation.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 533 – Pumping Plant.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard, (CPS) 533 – Pumping Plant.

Feature Measure: Each pump modified

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,664.21

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $7,664.21

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E533D - Switch fuel source for pumps

Scenario: #12 - Replacement of Fuel Source

Scenario Description:
Switch the fuel source for pump motor(s) to an on-farm renewable source (wind, solar, geothermal, etc.)

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 533 – Pumping Plant.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard, (CPS) 533 – Pumping Plant.

Feature Measure: Each pump modified

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $17,737.88

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $17,737.88

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E550A - Range planting for increasing/maintaining organic matter

Scenario: #1 - Establish Vegetation to Improve Soil Organic Matter

Scenario Description:
Establishment of adapted perennial or self-sustaining vegetation such as grasses, forbs, legumes, shrubs and trees for the purpose of increasing or maintaining organic matter levels in the soil.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 550 - Range Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 550 - Range Planting

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $5,373.56

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $53.74

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E550B - Range planting for improving forage, browse, or cover for wildlife

Scenario: #1 - Plantings for Wildlife

Scenario Description:

Establishment of adapted perennial or self-sustaining vegetation such as grasses, forbs, legumes, shrubs and trees for the purpose of improving forage, browse, or cover for wildlife on areas that have been degraded beyond recovery via ecological principles, or old crop fields and pastures devoid of desirable, native rangeland species that fit within an ecological site description steady state.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 550 - Range Planting

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 550 - Range Planting

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,545.68

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $25.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E570A - Enhanced rain garden for wildlife

Scenario: #2 - Rain Garden

Scenario Description:
Seed or plug nectar and pollen producing plants into rain gardens to provide wildlife habitat.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 570 - Stormwater Runoff Control

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 570 - Stormwater Runoff Control

Feature Measure: Square Feet

Scenario Unit: Square Foot

Scenario Typical Size: 1,080.0

Scenario Total Cost: $250.94

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $0.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E578A - Stream crossing elimination

Scenario: #1 - Decommission Stream Crossing

Scenario Description:
Existing stream crossings on an operation are consolidated into fewer crossings in order to reduce impacts to stream habitat.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 578 - Stream Crossing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 578 - Stream Crossing

Feature Measure: Typical feature is 0.09 acres

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $11,367.78

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11,367.78

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E580A - Stream corridor bank stability improvement

Scenario: #1 - Vegetation for Bank Stability

Scenario Description:
Stream corridor bank vegetation components are established to provide additional streambank stability.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $4,981.41

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,490.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E580B - Stream corridor bank vegetation improvement

Scenario: #1 - Vegetation for Wildlife

Scenario Description:
Stream corridor bank vegetation components are established to improve ecosystem functioning and stability.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 2.0

Scenario Total Cost: $4,981.41

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,490.70

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E590A - Improving nutrient uptake efficiency and reducing risk of nutrient losses

Scenario: #1 - Nutrient Uptake Strategies

Scenario Description:

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrients are currently being applied on the farm based on the 4R nutrient stewardship principles. Enhanced nutrient use efficiency strategies or technologies are utilized to improve nutrient use efficiency and reduce risk of nutrient losses to surface and groundwater and reduce risks to air quality by reducing emissions of greenhouse gases (GHGs).

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 590 - Nutrient Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 590 - Nutrient Management

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,361.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $13.61

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E590B - Reduce risks of nutrient loss to surface water by utilizing precision agriculture technologies

Scenario: #1 - Precision Nutrient Application

Scenario Description:
Precision application technology and techniques are utilized to plan and apply nutrients to improve nutrient use efficiency and reduce risk of nutrient losses.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 590 - Nutrient Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 590 - Nutrient Management

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,123.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $21.23

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E590C - Improving nutrient uptake efficiency and reducing risk of nutrient losses on pasture

Scenario: #2 - Improve Nutrient Efficiency

Scenario Description:

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrients are currently being applied on the farm based on the 4R nutrient stewardship principles. Enhanced nutrient use efficiency strategies or technologies are utilized to improve nutrient use efficiency and reduce risk of nutrient losses on pasture.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 590 - Nutrient Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 590 - Nutrient Management

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $2,484.73

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $24.85

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E590D - Reduce nutrient loss by increasing setback awareness via precision technology for water quality

Scenario: #2 - Precision Nutrient Application, Setbacks

Scenario Description:

Precision technology and techniques are used to increase Soil/Groundwater Setbacks & Associated Application Rate Restrictions (SGS&AARR) implementation during nutrient application by providing precise, real-time location information (geo-located) in the field to the equipment operator. While operating nutrient application equipment, the operator's location is continually updated and displayed on an add-on GPS-enabled device visible to the operator at all times to reduce the risk of nutrient application in setback and/or sensitive areas. Resource concerns addressed are Water Quality, Field sediment, nutrient and pathogen loss: Nutrients transported to groundwater and surface water and Pathogens and chemicals from manure, biosolids or compost applications transported to groundwater and surface water.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 590 - Nutrient Management.

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 590 - Nutrient Management.

Feature Measure: Acres with setback for nutri

Scenario Unit: Acre

Scenario Typical Size: 300.0

Scenario Total Cost: $4,336.88

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $14.46

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E595A - Reduce risk of pesticides in surface water by utilizing precision pesticide application techniques

Scenario: #1 - Precision Pesticide Application

Scenario Description:
Utilize precision application techniques to reduce risk of pesticides in surface water by reducing total amount of chemical applied and reducing the potential for delivery of chemicals into water bodies.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 595 - Integrated Pest Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 595 - Integrated Pest Management

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,248.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $12.48

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E595B - Reduce risk of pesticides in water and air by utilizing IPM PAMS techniques

Scenario: #1 - IPM PAMS, Air and Water

Scenario Description:
Utilize integrated pest management (IPM) prevent, avoidance, monitoring, and suppression (PAMS) techniques to reduce risk of pesticides in water and air. Reduce the potential for delivery of chemicals into water or ozone precursor emissions .

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 595 - Integrated Pest Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 595 - Integrated Pest Management

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $679.32

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.79

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E595D - Increase the size requirement of refuges planted to slow pest resistance to Bt crops

Scenario: #1 - Manage Refuge Size for Pest Resistance

Scenario Description:

Bacillus thuringiensis (Bt) plant incorporated protectants are plants that have been genetically altered to produce proteins that are harmful to certain insect pests. Widespread implementation of Bt crops has decreased insecticide use and increased crop yields, but it must be used as part of an integrated pest management (IPM) approach to protect the crop from pest species that are not susceptible to the Bt toxin and to manage pest resistance. Crop rotation, scouting and resistance management strategies, such as planting and creating refuges of non-Bt crops, are essential when farming Bt crops. Insects have developed resistance to Bt proteins. To mitigate the development of further resistance, growers are required to plant refuges of non-transgenic crops. These refuges produce numbers of susceptible insects that will help sustain populations of non-resistant insects. The size of Refuge requirement depends on the environment, pest and strain of the crop. Size of refuge is determined by resistance risk. Most Bt corn requires that 20% of the total Bt crop planted be non-Bt. Cotton can require 50% of the crop be planted to non-Bt. A recent study published in the Journal of Integrated Pest Management revealed, compliance has been a challenge. Nearly 40% of growers surveyed did not plant the required refuge (Reisig 2017). They credit non-compliance, in part, to lack of understanding by small-scale farmers about the need for refuges.

Before Situation:

Minimal or no refuges were planted as required for Bt crops.

After Situation:

Optimum sized and located refuges are planted for Bt crops.

Feature Measure: Ac

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $563.93

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $14.10

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E595E - Eliminate use of chemical treatments to control pests and to increase the presence of dung beetles

Scenario: #1 - Dung Beetles

Scenario Description:

Pests and parasites can have a significant impact on the economic viability of livestock operations, by affecting the performance and health of animals. The use of broad-spectrum insecticides, pour-ons and avermectins have been shown to have a detrimental effect on dung beetle populations. Having a healthy population of dung beetles facilitates the recycling of nutrients and promotes soil and grassland health. By eliminating the application of broad-spectrum insecticides, pour-ons, and avermectins, including injectable avermectins, for pest control in and on livestock along with rotational grazing and higher stock densities has shown to increase the dung beetle population. Use of natural or alternative methods of pest control over multiple years is encouraged.

Before Situation:

Pests and parasites can have a significant impact on the economic viability of livestock operations, by affecting the performance and health of animals. The use of broad-spectrum insecticides, pour-ons and avermectins have been shown to have a detrimental

After Situation:

Having a healthy population of dung beetles facilitates the recycling of nutrients and promotes soil and grassland health. By eliminating the application of broad-spectrum insecticides, pour-ons, and avermectins, including injectable avermectins, for pest

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 500.0

Scenario Total Cost: $3,398.40

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $6.80

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E595F - Improving Soil Organism Habitat on Agricultural Land

Scenario: #2 - Reduce Use of Seed Treatments

Scenario Description:

To reduce or eliminate the use of seed treatments in corn and soybean cropping systems to promote beneficial organism populations and pest control. Beneficial organisms such as the Carabidae beetle are very important in the population control of common agricultural pests like the grey garden slug. Slugs are a common pest in no-till and heavily cover cropped fields. Slugs are mollusks and can ingest some treatments with no adverse effects. Beneficial organism populations can be negatively impacted when they consume slugs exposed to seed treatments. The reduction or elimination of routine seed treatments in these cash crop systems may increase beneficial insect populations.

Before Situation:

Seed treatments are used on crops.

After Situation:

Producers effectively reduce or eliminate seed treatment use in their cropping rotations either by eliminating seed treatments on corn-soybean rotations or eliminating seed treatments on corn.

Feature Measure: Acres Planted

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $576.95

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $11.54

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E595G - Reduced resistance risk by utilizing PAMS techniques

Scenario: #2 - PAMS Management for Resistance

Scenario Description:

Design and implementation of an integrated pest management plan that will Utilize integrated pest management (IPM) prevention, avoidance, monitoring, and suppression (PAMS) techniques to reduce pesticide resistance and address plant pest pressure. Increased resistance leads to increased use of more toxic pesticides and increased risk of delivery of chemicals to water or ozone precursor emissions.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 595 – Pest Management Conservation Systems

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level described in Conservation practice Standard (CPS) 595 Pest Management Conservation System.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 100.0

Scenario Total Cost: $1,618.49

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $16.18

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E612B - Planting for high carbon sequestration rate

Scenario: #3 - Increase Carbon Sequestration

Scenario Description:

Plant tree species and use stocking levels for higher growth to increase the rate of carbon sequestration (capture). Use species with a longer life span as well as relatively fast growth, and species suitable for durable manufactured products. Increase stocking levels in forests that are not fully stocked. Implement afforestation on appropriate open lands.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $8,386.79

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,677.36

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E612D - Adding food-producing trees and shrubs to existing plantings

Scenario: #1 - Food-Producing Trees and Shrubs

Scenario Description:
Plant food-producing trees and shrubs for wildlife within windbreaks, alley cropping, multi-story cropping, silvopasture systems, and/or riparian forest buffers.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,429.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $242.99

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E612E - Cultural plantings

Scenario: #1 - Cultural Significant, Woody Species

Scenario Description:
Plant trees and shrubs that are of cultural significance, such as those species utilized by Tribes in traditional practices, medicinal plants, species used in basket-making, etc. (e.g., paper birch, slippery elm, witch hazel).

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $2,156.92

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,156.92

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E612F - Sugarbush management

Scenario: #1 - Sugarbush, Pollinator and Wildlife

Scenario Description:

Establish or maintain species diversity in a sugarbush to enhance pollinator and wildlife needs. Maintain at least 20% of basal area in species other than sugar maple (Acer saccharum) to provide species diversity. Half of the trees that are not sugar maples (10%) will be mast producing species (hard or soft mass). Use maple tree tapping guidelines that minimize tree damage.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $962.88

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $962.88

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E612G - Tree/shrub planting for wildlife food

Scenario: #1 - Wildlife Plantings

Scenario Description:
Tree or shrub planting to enhance habitat for native wildlife. A minimum of five tree or shrub species will be used; they will be species that provide food and/or cover for identified wildlife species.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $2,191.39

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $2,191.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E643A - Restoration of sensitive coastal vegetative communities

Scenario: #1 - Restore Native Herbaceous and Woody Species

Scenario Description:

Enhance the level of restoration in unique and diminishing coastal ecosystems by establishing native herbaceous and woody plants. Protect established vegetation, and manage to maintain floristic quality and the provision of environmental services. This enhancement is applied on unique areas with rare and declining habitat conditions, where vegetation has been detrimentally altered by human or natural events. Targeted sites are those that formerly supported vegetative communities that are now declining and/or becoming rare. The sites will vary across the continent. The enhancement will expand and elevate the process of restoring these unique areas, increasing their ecological value and benefits to wildlife. It re-establishes a select group of trees and/or shrubs that are key components in this ecosystem.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 643 - Restoration and Management of Rare and Declining Habitats

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 643 - Restoration and Management of Rare and Declining Habitats

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 25.0

Scenario Total Cost: $3,806.59

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $152.26

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E643B - Restoration and management of rare or declining habitat

Scenario: #1 - Create Habitat Refugia

Scenario Description:
Provide protection from adverse environmental conditions to create refugia for documented occurrences of sensitive plant communities.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 643 - Restoration and Management of Rare and Declining Habitats

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 643 - Restoration and Management of Rare and Declining Habitats

Feature Measure: Feet of Fence

Scenario Unit: Foot

Scenario Typical Size: 440.0

Scenario Total Cost: $4,574.68

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $10.40

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E643C - Restore glade habitat to benefit threatened and endangered species and state species of concern

Scenario: #2 - Restore Glade Habitat

Scenario Description:

Restore Glade natural communities as shown by the Ecological Site Description to conserve biodiversity. Enhancement requires reducing woody canopy cover and applying at least one prescribed fire to treated acres. Restoration of glade communities provide habitat for rare and declining species. Sites that previously or currently support the rare and declining habitat will be targeted for restoration.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 643 - Restoration of Rare or Declining Habitat.

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 643 - Restoration of Rare or Declining Habitat.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 5.0

Scenario Total Cost: $6,915.69

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,383.14

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E644A - Managing Flood-Irrigated Landscapes for Wildlife

Scenario: #1 - Manage Flood-Irrigation Water Depth

Scenario Description:
Developing and implementing a conservation plan that supports maintenance of flood-irrigation in key landscapes to provide important foraging habitat for local breeding and migratory waterfowl and waterbirds.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 644 – Wetland Wildlife Habitat Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 644 – Wetland Wildlife Habitat Management

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,483.46

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $29.67

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E645A - Reduction of attractants to human-subsidized predators in sensitive wildlife species habitat

Scenario: #1 - Reduce Non-Target Wildlife Attractants

Scenario Description:

Reduction of artificial perching sites, nest sites, food, and water available to subsidized predators in areas where human-subsidized predators are a threat to sensitive wildlife species. Human-subsidized predators may include ravens, crows, magpies, coyotes, foxes, skunks, raccoons, and other species. Activities under this enhancement may include removal of non- native or invasive trees; removal of unused power poles, corrals, windmills, buildings, and other vertical structures; and/or removal or management of watering facilities, dead livestock, road kill, garbage, animal feed, dumps, and other non-natural food sources.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 645 - Upland Wildlife Habitat Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 645 - Upland Wildlife Habitat Management

Feature Measure: Acre

Scenario Unit: Number

Scenario Typical Size: 40.0

Scenario Total Cost: $2,467.54

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $61.69

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E645B - Manage existing shrub thickets to provide adequate shelter for wildlife

Scenario: #2 - Management of Shrub Thickets

Scenario Description:

Existing shrub thickets provide an instant and important cover for wildlife. Various wildlife species may use shrubs as winter/thermal cover, summer shade, roosting, or as escape cover from predators. Proper management ensures that these shrubs will continue to provide the desired benefits for the local wildlife. A combination of herbicide treatments, cutting and trimming branches, and removal of other competing vegetation will occur. An eligible existing shrub thicket needs to have a canopy cover of 750 square feet, with an end goal of expanding to 1500 square feet. Any existing shrub thicket (not hand planted within the last 5 years) are eligible for this enhancement. Shrub thickets found within fence rows may now be very wide, but still meet the 750 square feet, are eligible.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 645 - Upland Wildlife Habitat Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 645 - Upland Wildlife Habitat Management

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $445.19

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $445.19

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E645C - Edge feathering for wildlife cover

Scenario: #2 - Edge Feathering

Scenario Description:

Selected trees are cut and brush clipped along the border between a wooded area and a grassland, cropland, or idle land, creating a dense woody cover of interlocking branches at ground level. The feathered edge will be an average of 30 feet wide and a minimum of 50 feet long, resulting in an area of 1500 square feet. The width of the strip will vary to follow topographic features and to create a wavy border; the design will also consider aesthetics. Vegetative composition and cover will vary within the edge, ranging from areas with no trees and shrubs to areas with scattered trees and extensive shrub cover. The variation in vegetation structure along with variable width of the edge will create feathering. The edge may include shrub plantings for wildlife food and aesthetics.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 645 - Upland Wildlife Habitat Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 645 - Upland Wildlife Habitat Management

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1,012.91

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1,012.91

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E645D - Wildlife Habitat Management Plan for Upland Landscapes

Scenario: #11 - Upland Landscapes

Scenario Description:

Develop and implement a wildlife habitat management plan that removes or significantly reduces the impact of existing land management activities occurring within agricultural landscapes (on any land use) causing chronic disturbance to wildlife during breeding, rearing, migration and over- wintering periods. Site monitoring may be necessary to identify and document sources of disturbance to wildlife. Examples of adjustments to existing management activities that can reduce disturbance to a tolerable level include: use of integrated pest management; capping of open vertical pipes; provision of wildlife-friendly water access and egress; and reduction of noise or movement within key migratory, nesting, rearing, loafing or hiding locations.

Before Situation:

The inadequate terrestrial wildlife habitat concern has been addressed under Conservation Practice Standard 645 and minimum planning criteria for the terrestrial wildlife habitat resource concern has been met. However, disturbance related impacts tied to

After Situation:

Land management activities occurring within the agricultural landscape (on any land use) have been adjusted to avoid causing chronic disturbance to wildlife during breeding, rearing, migration and over- wintering periods has been addressed. Planning criteria for the terrestrial wildlife habitat resource concern exceeds minimum planning criteria.

Feature Measure: Acres of Improved Habitat

Scenario Unit: Acre

Scenario Typical Size: 40.0

Scenario Total Cost: $588.75

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $14.72

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E646A - Close structures to capture and retain rainfall for waterfowl and wading bird winter habitat

Scenario: #1 - Rainfall Retention for Wildlife Habitat

Scenario Description:

When flooded to shallow depths during fall and winter, agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds . In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,569.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $31.39

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E646B - Extend retention of captured rainfall for migratory waterfowl and wading bird late winter habitat

Scenario: #1 - Rainfall Retention for Wildlife Habitat, Expansion

Scenario Description:

When flooded to shallow depths during fall and winter, agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds. Harvested and idled agricultural lands, notably those occurring within rice rotations, contain high densities of residual (i.e., waste) grain and natural seeds following harvest. In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds. Benefits may become greatest during late winter and early spring as birds are assimilating nutrient and fat reserves in preparation for northward migration. However, agricultural fields flooded during fall-winter are typically drained during late January or February in advance of spring planting. This often results in a rapid reduction in available habitat, and may constrain ability of migratory birds to adequately prepare for migration, with greatest impacts likely occurring during years of low winter precipitation. Retention of water on agricultural lands into early spring will produce maximum benefits to migratory waterfowl and shorebirds by providing high quality habitat during a time when habitat may otherwise be in low abundance.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $1,861.20

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $37.22

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E646C - Manipulate vegetation and maintain closed structures for shorebirds mid-summer habitat

Scenario: #1 - Shorebirds Habitat, Mid-Summer

Scenario Description:

Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding and providing shallow water and mud flat habitat will benefit a variety of shorebird species. Optimal conditions are created when water levels are slowly reduced through evaporation, which allows for propagation of invertebrates (typically insect larvae) used as food by shorebirds. Manipulation of vegetation, preferably through rolling, creates open conditions required by this suite of birds as a means to detect and avoid predators, and provides nutrient inputs for invertebrate production.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $3,468.02

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $69.36

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E646D - Manipulate vegetation and maintain closed structures for shorebird late summer habitat

Scenario: #1 - Shorebirds Habitat, Late-Summer

Scenario Description:

Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding. Providing shallow water and mud flat habitat will benefit a variety of shorebird species. Optimal conditions are created when water levels are slowly reduced through evaporation, which allows for propagation of invertebrates (typically insect larvae) used as food by shorebirds. Manipulation of vegetation, preferably through rolling, creates open conditions required by this suite of birds as a means to detect and avoid predators, and provides nutrient inputs for invertebrate production.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $3,794.27

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $75.89

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E647A - Manipulate vegetation on fields with captured rainfall for waterfowl & wading bird winter habitat

Scenario: #1 - Waterfowl and Wading Bird Habitat, Winter

Scenario Description:

Harvested and idled agricultural lands, notably those occurring within rice rotations, contain high densities of residual (i.e., waste) grain and natural seeds following harvest. Seed densities in harvested rice fields may rival those documented in intensively managed moist-soil units, especially in the Gulf Coast and Central Valley of California. When flooded to shallow depths during fall and winter, these agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds. In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds. In many cases, light manipulation of dense vegetation is needed to improve the accessibility of food resources to waterfowl, wading birds, and shorebirds.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,466.68

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $49.33

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E647B - Provide early successional shorebird habitat between first crop and ratoon crop

Scenario: #1 - Shorebirds Habitat, First and Ratoon Crop

Scenario Description:

Many declining suites of wildlife species rely on early successional habitats for at least part of their life cycle needs. Migratory shorebird species in particular rely on open, moist soil or shallowly flooded conditions for foraging and security. Rice farms support many migratory and resident water bird species. The first rice crop harvest often coincides with the arrival of early migrating shorebirds. This time of year is also the highest rainfall months. If standing rice stubble from the first crop is rolled to push above-ground stalks level with the soil surface, the first component of this type of habitat is met. When moisture is added to this situation, short-term habitat is available until the ratoon crop initiates growth to a height beyond that which would provide benefit to the early successional species.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,466.68

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $49.33

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E647C - Maintain most soil vegetation on cropland edges to enhance waterfowl and shorebird habitat

Scenario: #1 - Cropland Edges

Scenario Description:

The wetter or more water saturated portions of cropland fields such as areas adjacent to field drains, have the potential to produce a significant amount of moist soil plants which are a tremendously valuable source of forage and cover for many waterfowl, shorebird and wading bird species, especially during a period of time when such plants may be limited. Under normal cropland production, the native vegetation is restricted on these sites through mechanical and/or chemical control. These maintained moist soil plants also will provide filtering and improve water quality.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $854.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $17.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E647D - Establish and maintain early successional habitat in ditches and bank borders

Scenario: #1 - Vegetation Establishment, Ditches and Banks

Scenario Description:

This enhancement is to encourage the establishment of early successional, naturally occurring vegetation in ditches, side slope and bank borders to provide cover, critical nesting and brood rearing habitat as well as filtering overland flow and improving water quality. Ditches perform the critical function of removing water from agricultural lands. Allowing naturally occurring vegetation to develop along ditches, including side slopes, banks and borders, will help provide food and cover for wildlife while enhancing aquatic habitat and improving water quality. Ditches and ditch borders provide a foundation that supports a diverse wildlife community including Northern Bobwhite (Colinus virginianus) and other birds preferring early successional cover. Rabbits, furbearers, amphibians and many other species that inhabit agriculture areas will use this vegetative cover. These areas can also provide critical nesting habitat for the Mottled Duck (Anas fulvigula).

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $854.52

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $17.09

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E666A - Maintaining and improving forest soil quality

Scenario: #1 - Forest Management

Scenario Description:

Adopts guidelines for maintaining and improving soil quality on sites where forest management activities are practiced. These guidelines will increase soil organic matter content, improve nutrient cycling, and increase infiltration and retention of precipitation. Avoiding soil compaction will allow for greater root development and tree growth, limit windthrow, and reduce drought stress. Increasing carbon storage on site will maintain the soil microbial community and provide wildlife benefits.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 50.0

Scenario Total Cost: $2,468.30

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $49.37

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E666D - Forest management to enhance understory vegetation

Scenario: #1 - Understory Enhancement

Scenario Description:

This enhancement provides for management of the understory vegetation in a forested area by mechanical, chemical, and/or manual methods to improve the plant species mix and the health of the residual vegetation. Managing the understory vegetation increases available water to the plants, minimizes runoff and erosion, and improves water quality. An adequately stocked forest provides inputs of leaves, needles, and woody twigs and stems to the forest floor, adding to soil organic matter and contributing to forest soil health. Desirable tree species and understory vegetation, with spacing that allows ground cover to develop, will allow moisture to infiltrate and be stored in the soil, releasing moisture over longer periods of time.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $6,129.07

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $306.45

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E666E - Reduce height of the forest understory to limit wildfire risk

Scenario: #1 - Woody Understory Reduction

Scenario Description:

Forest stand improvement that manages forest structure to reduce the risk of wildfire, and creates conditions that facilitate prescribed burning. The fire risk reduction is accomplished by reducing the height of the woody understory and midstory, creating space between the ground cover and the tree canopy. This enhancement provides for management of the understory vegetation in a forested area, using mechanical, chemical or manual methods to improve the plant species mix and the health of the residual vegetation, and reduce the risk of wildfire. In appropriate stands, the treatment creates conditions that favor prescribed burning. Forest stand improvement (FSI) activities are used to remove trees of undesirable species, form, quality, condition, or growth rate. The quantity and quality of forest for wildlife and/or timber production will be increased by manipulating stand density and structure. These treatments can also reduce wildfire hazards, improve forest health, restore natural plant communities, and achieve or maintain a desired native understory plant community for soil health, wildlife, grazing, and/or browsing.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $6,129.07

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $306.45

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E666F - Reduce forest stand density to create open stand structure

Scenario: #1 - Open Structures

Scenario Description:

Reducing forest stand density creates open forest conditions with a low basal area which promotes the health and vigor of the residual trees. The open stand structure allows a significant amount of sunlight to reach the forest floor and stimulates the growth of understory vegetation. Understory vegetation management, along with the wide spacing between trees or clumps of trees, provides visual appeal, lowers the risk of wildfire, and provides habitat for many at-risk and listed wildlife species. The enhancement creates conditions that facilitate a follow-up treatment with prescribed burning.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 20.0

Scenario Total Cost: $7,058.75

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $352.94

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E666G - Reduce forest density and manage understory along roads to limit wildfire risk and improve habitat

Scenario: #1 - Management of Understory

Scenario Description:

Opening the tree canopy along roads ("daylighting"), and providing space between ground vegetation and tree crowns minimizes the spread of wildfires that often start along roads, and improves wildlife habitat and food sources for many species. Some trees near a forest road are removed through harvesting, cutting, mulching, or another option available at the site, with the objective of creating a partially open forest canopy bordering the road. A semi-open canopy allows more sunlight to reach the forest floor to promote herbaceous understory plants, and reduces maintenance needs by allowing moisture to evaporate from roads. The reduced canopy and herbaceous understory limit woodland fuel buildup and reduce fire intensity.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $3,495.24

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $349.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E666H - Increase on-site carbon storage

Scenario: #1 - Carbon Storage, Onsite

Scenario Description:

Use forest management techniques to maintain and increase on-site carbon storage. These include, but are not limited to, applying uneven-aged management, using longer rotations, retaining cavity/den trees, snags, and down woody debris, and protecting or increasing soil organic material.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $8,747.12

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $874.71

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E666I - Crop tree management for mast production

Scenario: #1 - Mast Production

Scenario Description:
Forest stand improvement using crop tree management techniques to increase mast production

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $4,305.18

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $430.52

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E666J - Facilitating oak forest regeneration

Scenario: #1 - Oak Revitalization

Scenario Description:

Facilitate oak regeneration following a forest stand improvement treatment for natural oak regeneration (i.e., a regeneration cut). After a regeneration cut, oaks in the seedling and sapling stages are often out-competed by invasive brush and undesirable tree and shrub species. This enhancement will release seedling and sapling oaks from competing invasive plants and other undesirable species, and thin stump sprouts. A forester will monitor site conditions, treat competition, protect seedlings, and recommend additional follow-up treatments as needed. The enhancement protects investments in oak regeneration by providing for follow-up activities that require the expertise of a professional forester.

Before Situation:

Naturally regenerated oak seedlings and/or saplings are threatened by competition from undesirable vegetation.

After Situation:

Oaks in the forest stand are free from competition and have adequate space and light to allow them to grow into the forest canopy.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 25.0

Scenario Total Cost: $16,663.19

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $666.53

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E666K - Creating structural diversity with patch openings

Scenario: #1 - Patch Openings

Scenario Description:

Forest stand improvement that creates patch openings. Size, shape, and arrangement of patches will be based on natural features, and emulate patches that would result from natural disturbance regimes of wind or fire, varying geographically and by forest type, and by tree species desired from natural regeneration. The treatment will create diversity in stand composition and structure, increase pest resistance, and enhance wildlife food availability. Openings may provide regeneration sites and restore natural plant communities, and achieve or maintain a desired understory plant community for wildlife habitat.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 15.0

Scenario Total Cost: $9,702.48

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $646.83

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E666L - Forest Stand Improvement to rehabilitate degraded hardwood stands

Scenario: #1 - Rehabilitate Degraded Hardwood Stands

Scenario Description:

Hardwood forestland has been subject to poor logging practices ("high-grading") for decades. Without professional forestry assistance the best species and individual trees are removed, often before maturity ("diameter-limit cutting"), leaving the poorest species and individual trees to regenerate the stand. Reversing this process requires cutting or killing poor quality trees while retaining any desirable species that might still be present. A combination of 3 silvicultural methods are applied: crop tree release, group selection (all trees removed from an area 0.25 to 1.0 acre in size) and small clear-cuts (all trees removed from an area 1-3 acres in size).

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $6,164.95

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $616.49

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E666O - Snags, den trees, and coarse woody debris for wildlife habitat

Scenario: #1 - Dead or Decaying Trees for Habitat

Scenario Description:
Improve wildlife habitat through creation and retention of snags, den trees, forest stand structural diversity, and coarse woody debris on the forest floor, to provide cover/shelter for native wildlife species.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $585.67

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $58.57

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E666P - Summer roosting habitat for native forest-dwelling bat species

Scenario: #1 - Roosting Habitat for Bat Species

Scenario Description:
Create new potential roost trees within upland and riparian forests to achieve desired summer habitat for forest-dwelling bat species.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 10.0

Scenario Total Cost: $2,476.08

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $247.61

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E666R - Forest songbird habitat preservation

Scenario: #1 - Habitat Management, Songbird

Scenario Description:

Adopts guidelines and methods developed by the Forest Bird Initiative of the Vermont Audubon Society, to preserve habitat features following a forest stand improvement treatment designed to create habitat for a suite of forest-dwelling neotropical migratory songbirds. It includes developing or updating a forest management plan, inspecting and tending forest habitat, and monitoring bird populations. It protects investments in habitat creation by providing for follow-up activities that require the expertise of a professional forester or biologist. This enhancement is appropriate for states in the Atlantic Flyway and the Upper Midwest.

Before Situation:

The bird habitat of a forest stand is threatened by undesirable vegetation, including noxious and invasive plants, and tree regeneration of species not favorable to birds. Harmful insects and tree diseases may also be present, and storms may have damaged

After Situation:

The forest stand has retained its habitat features and is utilized by a diversity of neotropical migratory songbirds.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 25.0

Scenario Total Cost: $5,463.86

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $218.55

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: E666S - Facilitating longleaf pine establishment

Scenario: #5 - Longleaf Pine

Scenario Description:

This enhancement facilitates longleaf pine regeneration and establishment following a forest stand improvement treatment for natural regeneration (e.g., a regeneration cut), or where longleaf has been previously planted. After a regeneration cut or a planting, competition from invasive brush and undesirable tree and shrub species often suppresses successful establishment of longleaf pine. This enhancement will release seedling and sapling longleaf from competing invasive plants and other undesirable species. A forester inspects the stand periodically for resource concerns that clients do not have the skills to recognize and assess, conducts regeneration surveys, and makes recommendations for corrective actions (typically at one year following initial treatment, and then at intervals of 2-4 years). Undesirable plants competing with longleaf pine are mechanically cut and/or receive herbicide spot treatments and/or cut stem treatments, as needed. The herbicides listed in the component section of this scenario are for deriving a cost estimate only. Resource concerns include Plant Productivity and Health, and Plant Structure and Composition.

Before Situation:

Naturally regenerated or planted longleaf pine seedlings and/or saplings are threatened by competition from undesirable vegetation.

After Situation:

Longleaf pines in the forest stand are free from competition and have adequate space and light to allow them to grow into the forest canopy.

Feature Measure: Acres

Scenario Unit: Acre

Scenario Typical Size: 25.0

Scenario Total Cost: $6,308.63

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $252.35

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: RFRN - FA Rental Payment based on NRCS Defined Model

Scenario: #10 - Rental Payment, Irrigated Cropland

Scenario Description:
FA payment earned for rental activity to provide conservation benefit based on NRCS defined tasks or templates.

Before Situation:
Eligible Lands with Project Resource Concerns

After Situation:
Eligible Lands where Project Resource Concerns are managed via Rental Contract

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost:	$197.00	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$197.00	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: RFRN - FA Rental Payment based on NRCS Defined Model

Scenario: #11 - Rental Payment, Non-irrigated Cropland

Scenario Description:
FA payment earned for rental activity to provide conservation benefit based on NRCS defined tasks or templates.

Before Situation:
Eligible Lands with Project Resource Concerns

After Situation:
Eligible Lands where Project Resourced Concerns are managed via Rental Contract

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost:	$117.00	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$117.00	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: RFRN - FA Rental Payment based on NRCS Defined Model

Scenario: #12 - Rental Payment, Pastureland

Scenario Description:
FA payment earned for rental activity to provide conservation benefit based on NRCS defined tasks or templates.

Before Situation:
Eligible Lands with Project Resource Concerns

After Situation:
Eligible Lands where Project Resource Concerns are managed via Rental Contract

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost:	$24.50	*Based on Tennessee average costs. Individual county costs may vary.*
Total Cost per Unit:	$24.50	

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.

Practice: RFRP - FA Rental Payment based on Negotiated Project Specific Model

Scenario: #4 - Rental Payment, Negotiated Project

Scenario Description:
FA payment earned for agreed to rental activity to provide conservation benefits based on project specific negotiated rental activities.

Before Situation:
Eligible Lands with Project Resource Concerns

After Situation:
Eligible Lands where Project Resource Concerns are managed via Rental Contract

Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1.0

Scenario Total Cost: $1.00

Based on Tennessee average costs. Individual county costs may vary.

Total Cost per Unit: $1.00

Disclaimer: Do not use this information for practice implementation. Use the site-specific Design or Implementation Requirements.