



**CONSERVATION ENHANCEMENT ACTIVITY**

**E449144Z**

**CONSERVATION STEWARDSHIP PROGRAM**

Complete pumping plant evaluation for all pumps on a farm

**Conservation Practice 449: Irrigation Water Management**

**APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Associated Ag Land; Farmstead**

**RESOURCE CONCERN ADDRESSED: Inefficient Energy Use**

**ENHANCEMENT LIFE SPAN: 1 year**

**Enhancement Description**

Evaluation of all pumping plants on fields where activity is implemented to determine the potential to rehabilitate/replace/reconfigure pump performance to improve water delivery efficiency 10% or more.. Evaluate to determine if a Variable Frequency Drive motor controller(s) is recommended and the simple payback in terms of energy savings is less than 10 years.

**Criteria**

- Pump test evaluation will include all irrigation pumps on the on fields where activity is implemented. There could be multiple pumps that are used on single or multiple fields. Minimum data necessary to complete the pumping evaluation:
  - Flow rate, instantaneous and for the season
  - Pressure at different flow rates based on partial or complete irrigations
  - Power usage to compute efficiency of the drive unit.
  - Area and fields irrigated
  - Estimate of friction loss in pipelines based on pressure drop in lines during test

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- Irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):
  - An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture locations and depths (if used), and soils. If water level sensors are used, show locations and number of sensors used.
  - Methods used to measure or determine the flow rate or volume of the irrigation applications.
  - Measurement records showing the amount of water used to irrigate as it comes onto the farm and goes to each field.
  - Documentation of the scientific method used for scheduling the timing and amount of irrigation applications.
  - Irrigation water management plan explains:
    - How irrigation system meets crop needs, while maximizing irrigation water efficiency.
    - Seasonal or annual planned water application volumes by crop.
    - Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth.
    - Evaluation of irrigation system distribution uniformity and necessary changes to insure uniform irrigation.
    - Information on how to recognize irrigation induced erosion and how to mitigate it.
    - Indicate how data from the sensor locations and depths will be considered to make field-wide irrigation decisions.
    - Water application scheduling based on soil moisture or water level monitoring and or evapotranspiration monitoring from the weather station
  - Recordkeeping documents for the irrigator to use during operation and management



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### Documentation and Implementation Requirements

Participant will:

- Prior to implementation, provide NRCS with a map showing the location of all fields and pumps connected to the irrigation system.
- Prior to implementation, arrange for pump test evaluations of all irrigation pumps on fields where activity is implemented.
- Prior to implementation, acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements.
- During implementation, follow the irrigation water management plan and keep records as required by the plan.
- During implementation, have a pump test evaluation performed on all irrigation pumps on the on fields where activity is implemented .
- After implementation, make the following items available for review by NRCS to verify implementation of the enhancement:
  - Irrigation water management plan and records kept
  - Pump test evaluation report
  - Provide a list of any adjustments to improve system efficiency made as a result of the evaluation . Calculate the reduction of energy use based on before and after conditions. Energy savings can be reported as the average annual or seasonal energy reduction compared to previous operating conditions.

NRCS will:

- Prior to implementation, provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) as it relates to implementing this enhancement
- As needed, provide additional technical assistance to the participant as requested.



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- After implementation, verify implementation of the irrigation water management plan, by reviewing records kept during enhancement implementation.
- After implementation, verify pump test evaluation, by reviewing evaluation report.
- After implementation, verify energy savings based on system efficiency before and after implementation of the enhancement.

**NRCS Documentation Review:**

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name \_\_\_\_\_ Contract Number \_\_\_\_\_

Total Amount Applied \_\_\_\_\_ Fiscal Year Completed \_\_\_\_\_

\_\_\_\_\_  
NRCS Technical Adequacy Signature

\_\_\_\_\_  
Date