Targeted Implementation Plan

Lake County – Miller Coulee Water Quantity Improvement Project

Years of Implementation: 2019, 2020 & 2021

Goal Statement:

The goal of this project is to increase water quantity and subsequently water quality on drainage of Miller's Coulee located within the greater Crow Creek Watershed on the Flathead Reservation in Lake County, Montana. The drainage of Miller's Coulee is encompassed within the Crow Creek Watershed. The project goals will be achieved by improving irrigation efficiency on approximately 2,000 acres of irrigated crop and pasture land. A secondary benefit would provide for a reduction of sediment and nutrients carried by off-field movement of irrigation water.

Background and Problem Statement:

Within Lake County on the Flathead Reservation water quantity and water quality are both primary concerns of the Confederated Salish and Kootenai Tribes (CSKT). Flathead Indian Irrigation Projects (FIIP) operates the irrigation delivery system within the project area. Water quotas are limited making the wise and sustainable use of limited water resources critically important. Flood irrigation in the project area is extremely inefficient and it is estimated that only approximately 25% to 40% of water applied is effectively used by plants as desired (Farm Irrigation Rating Index (FIRI) data). The remaining water is lost to runoff or evaporation.

In 2015 after more than a decade of negotiation the State of Montana Legislature ratified the CSKT Montana Compact outlining water usage for irrigation and instream flows on the CKST reservation and beyond. The Compact currently awaits approval by the United States Congress. The Compact protects historical irrigation uses while at the same time providing for Tribal in-stream flow targets. One of the key goals of the Compact is to improve irrigation efficiencies within the target area.

According to the *CSKT Water Quality Assessment Report - Flathead Reservation*, Crow Creek watershed is one of the most impaired watersheds within the county due to agricultural practices. The report highlights the Crow Creek Watershed stating: "Nonpoint source pollution loads derived from agricultural activities are the main source of impairment."

Another report published by CSKT called *Assessment of Water Quality Conditions on the Lower Flathead River - Flathead Indian Reservation,* looks deeper into the amount of pollutants and sediment entering the Lower Flathead River from all drainages. In this report CSKT has identified Crow Creek as having elevated amounts of nitrogen and phosphorus which exceeds Montana Department of Environmental Quality (MDEQ) criteria for total nitrogen and phosphorous. The report refers to the excess nitrogen in the waterway stating; "may occur as either particulate or dissolved forms and is often associated with agricultural inputs". In reference to the amount of phosphorus the report states that "irrigation return flows are elevated, and total phosphorus values exceed proposed MDEQ numeric criteria at return flow sites." Within the Crow Creek Watershed, Miller Coulee is particularly degraded. Miller Coulee has the highest levels of suspended solids, turbidity and E. Coliform of any creeks within the Crow Creek Watershed and the source of most of these pollutants is primarily agricultural runoff. (*Assessment of Water Quality Conditions in the Crow Creek Watershed – Flathead Indian Reservation, CSKT*)

Irrigated cropland and pasture is a primary land use within the Mission Valley. Irrigation in the valley is a mix of both flood and sprinkler. Flood irrigation in the Mission Valley can generally be characterized as 'wild flood' meaning the flooding is often completed via a series of contour ditches over uneven topography. This uneven irrigation causes numerous dry areas within each field while also causing over-irrigation of other areas. Flood irrigation on uneven topography creates significant amounts of runoff. This runoff not only wastes water but also reduces water quality in streams and waterbodies as the runoff often carries elevated levels of nutrients, sediments and higher water temperatures directly into impaired waterways and eventually into the Flathead river. (See Resource Inventory Pictures).

Most of the irrigated soils in the Mission Valley are silty clay loams. These soils have low infiltration rates and are particularly susceptible to runoff if irrigation water is over-applied or applied at rates that are greater than the intake rates of the soils.

Goals and Objectives:

The goal of this project is to improve water quantity within the focused project area. Limited water resources within the project area, coupled with poor water quality because of inefficient irrigation elevate the value of this project.

This project will increase water quantity and improve water quality in the Miller's Coulee drainage area by improving irrigation efficiency on approximately 2,000 acres of irrigated cropland and pasture. Focusing within this drainage area will allow NRCS to more wisely spend our limited funding by targeting specific conservation practices that will assist in addressing the identified resource concerns. To achieve the goals of this project the NRCS will work with between 15 and 30 landowners to cooperatively make on-farm improvements. Priority will be given to applications that will provide the highest resource benefits such as converting from flood irrigation to sprinkler and targeting projects that are in close proximity to impaired waterways.

To quantify expected efficiency improvements, the Farm Irrigation Rating Index (FIRI) has been used. According to FIRI, average efficiencies ratings for flood irrigation range between 25% and 40%. Converting these systems to handlines or wheel lines will increase efficiencies ratings to over 60%, an average increase of approximately 30%. Converting flood systems to pivots will increase ratings to nearly 70%, an increase of over 35%. Converting handlines or wheel lines to pivots would increase ratings from 55% to 70%, an increase of 15% (Source: Farm Irrigation Rating Index). These efficiency upgrades will directly result in less waste water leaving fields.

Table 1: FIRI Ratings

Irrigation System	Average FIRI Rating Before	Average FIRI Rating After	Average FIRI Rating Improvement
Flood to Pivot	31	71	40
Flood to Hand or Wheel Line	31	59	28
Hand or Wheel Line to Pivot	55	71	16

Flow meters will be installed on all irrigation systems to facilitate irrigation water management including measurement of the total volume of water applied over the course of the irrigation season. Irrigation Water Management (IWM) will be planned on each project to match irrigation events to soil intake rates

and plant needs. IWM will be encouraged with cost share available to contract this supporting practice's implementation. Through IWM producers will learn how to best operate their irrigation systems to maximize the value of irrigation water applications. NRCS and our partner Lake County Conservation District (LCCD) will work to provide follow-up monitoring to determine actual average on-farm irrigation efficiency increases as well as quantification of reductions in off-site movement of water, sediments, nutrients and pathogen levels.

Alternatives:

Alternative One, On-Farm Irrigation Improvement: Provide Conservation Technical Assistance (CTA) and Financial Assistance (FA) to improve irrigation efficiency via structural practice improvements within the Miller's Coulee drainage. Financial assistance and technical assistance will be provided to landowners to improve on-farm irrigation efficiencies. Offered conservation practices will be limited to irrigation-related practices.

Likely Outcome: Implementation of this alternative will lead to reduced off-site movement of water from the enrolled acres. Reductions in off-site movement of irrigation water will decrease irrigation return flows from enrolled acres. Reducing return flows will also reduce the sediment and nutrient loads entering imperiled waterways. Reducing the influx of wastewater (i.e. return flows) will assist in stabilizing the temperatures of the impaired waterways. Irrigation improvements will improve crop yields while at the same time addressing critically important resource concerns within the project area. This alternative will likely not significantly address grazing management or nutrient management which are contributing factors to water quality. However, working with landowners to make structural irrigation improvements 'opens the door' to continued dialog and potential action to make improvements in other areas of each operation. While working with producers on irrigation projects our staff will discuss and promote the adoption of other beneficial practices to aid in the potential development of expanded conservation efforts in both the short and long term.

Alternative Two, focus on non-Irrigated Conservation Improvements: Provide both CTA and FA to producers to implement water quality-related practices without providing assistance with irrigation-related infrastructure. CSKT Reports identify that agricultural activities and specifically agricultural runoff degrade water quality within the identified watershed. This degradation is a result of a combination of factors including livestock grazing, riparian management, fertility management and irrigation. Under this alternative the suite of practices offered would not include structural irrigation improvements. Practices such as grazing management, riparian management, fencing and nutrient management would be offered. Both CTA and FA would be provided to landowners to encourage adopting improvements.

Likely Outcome: Adopting this alternative would likely lead to improvements in water quality. Encouraging improvements in grazing and nutrient management as well as riparian management and fencing would likely reduce nutrient and sediment deposition into streams. Irrigation-related concerns would still be present and large quantities of water would be used inefficiently and/or would be returned to the watershed as return flows. Return flows would still likely carry higher than desired sediment and nutrient loads and would be of higher than optimal temperature. Selecting this alternative would only treat water quality-related issues but addressing those issues may have significant short- and long-term benefits.

Alternative Three, Comprehensive Plan including Irrigation Infrastructure Improvements and non-Irrigation Related Improvements: This alternative is a combination of alternative 1 and 2. Irrigation infrastructure improvements will be offered along with improvements in grazing management, nutrient management, riparian management and fencing.

Likely Outcome: Logically, adopting all the practices would provide the most beneficial outcomes. Management practices such as nutrient management and grazing management would likely decrease the quantities of moveable nutrients and sediments. Improving riparian areas and fencing would create wider buffer areas for sediment and nutrients to be filtered out before accessing live water sources and would likely reduce bank erosivity. Irrigation runoff would be reduced by making improvements to irrigation efficiencies by providing CTA and FA for structural improvements. All these improvements coupled together would benefit both water quality and quantity by decreasing contaminates, increasing areas for contaminates to be filtered out, and decreasing the amount of agricultural runoff. This alternative would likely improve both water quality and water quantity in the short and long term.

Proposed Solution and Actions:

Alternative one is the selected alternative. The proposed solution will target funding towards improving on-farm irrigation efficiency within the Miller's Coulee drainage areas. Theoretically, the adoption of alternatives two and three would have also provided significant resource benefits, however the feasibility of adoption at a scale necessary to provide those benefits is low. Working with producers to implement improved management practices would likely take too long to complete within the current planning window. In addition, much more work would be necessary to increase producer buy-in to the project. Failure to secure producer support would likely lead to unsuccessful implementation of these alternatives. We have chosen to move forward with alternative one because we have strong producer support and because implementing this alternative will provide significant benefits towards addressing the identified resource concerns.

We have opted to proceed with a targeted approach to implementing irrigation improvements by prioritizing projects based upon resource benefits provided. Existing irrigation systems will be evaluated both for potential irrigation efficiency increases as well as the potential resource benefits they may provide. Projects will be prioritized via screening and ranking to select those projects that provide the highest level of resource benefit and that are within the prioritized area. Alternative one has a high level of buy-in from producers. At least eight producers are ready, willing and able to implement this alternative within the selected area of focus. Focusing efforts in areas that have both a high interest level from producers coupled with large resource-related needs should provide the best "bang for the buck" and wisest use of limited NRCS monies.

NRCS will focus on specific irrigation-related practices -to address the goals of this project. The conservation practices selected are as follows:

- Sprinkler System (442) Core Practice
- Irrigation Pipeline (430) Supporting Practice
- Structure for Water Control (587) Supporting Practice
- Irrigation Water Management (449) Supporting Practice
- Pumping Plant (533) Supporting Practice

Partnerships:

Lake County Conservation District (LCCD) is a primary partner in the project. LCCD is bringing financial and technical assistance towards this project in the following ways:

- NACD Technical Assistance Grant: Full-time Resource Conservationist funded through NACD/LCCD.
  - Karli Becher serves as a full-time Resource Conservationist and has aided with planning, designing and contracting for this project.
  - Projected hours of TA are outlined in Table 4
- Administrative Support with producer communications, outreach and education

Technical Assistance and Financial Assistance Request:

If this proposal is implemented in full, it is estimated that the three-year cost of the project will be $1,450,000. Ranking criteria have been developed (see attached) to prioritize projects based upon irrigation efficiency increases, potential improvements to water quality and proximity to impaired waterways. Converting flood irrigated fields to sprinkler (with an emphasis on conversion to pivots) will be given highest priorities. As previously mentioned, runoff due to flood irrigation, is a leading cause of water quality impairments within the project area. Proximity of each field to impaired waterways will also be given priority. Risk of impairment to waterways from irrigation runoff is often greater the closer the field is to the live waterway. By prioritizing in these ways, it is expected that the applications that pose the highest environmental risks will be addressed at a higher priority than those applications that poses lesser risks.

Table 2: FY2019, FY2020 & FY2021 NRCS Financial Assistance Request:

Fiscal Year	Total Projects	Total NRCS Financial Assistance	Total Acres
2019	9	$750,000.00	1000
2020	5	$350,000.00	500
2021	5	$350,000.00	500
Total	**19**	**$1,450,000.00**	**2000**

Table 3: Technical Assistance Requirements to Implement TIP (Combined NRCS & Partner Contributions). Based on 20 total projects (FY2019 thru FY2021)

TA Activity	Average Time to Complete Each Task (hours)	Cumulative Time to Complete all Projects (hours)	Current Level of Completion for FY2019 Projects (%)
Design	36	720	65%
Planning/Contracting	60	1200	65%
Implementation/Certification	24	480	0%
Monitoring and Follow up	36	720	0%
Total	-	**3,120**	-

Total Staff Days for TA (Combined NRCS & Partner Contributions): 390 days

Table 4: Partner's Technical Assistance (TA) Provided by LCCD Resource Conservationist

TA Activity	Average Time Spent per Project (hours)	Cumulative Time for TIP (hours)
Design	8	240
Planning/Contracting	16	480
Implementation/Certification	8	240
Monitoring and Follow up	16	480
Total	-	**1,440**

Total Partner TA Contribution of Staff Day: 180 days

Table 5: Summary of NRCS and LCCD Partner TA Contributions for TIP, FY2019 thru FY2021

Total NRCS and LCCD TA Commitment (Hours)	NRCS TA Commitment (Hours)	LCCD TA Commitment (Hours)
3,120	1,680 hrs.	1,440 hrs.

Implementation:

Funding for this project is being requested for 2019, 2020 and 2021. It is expected that all irrigation improvements will be completed within two years of contract obligation. Contract development for this TIP will be completed in FY2019, FY2020 and FY2021. Implementation of contracts will begin in FY2019 and all contracts should be completed by FY2024.

At the time of submission of this proposal (February 1, 2019), 65% of all potential projects for FY2019 have been surveyed and have engineering designs completed for all planned practices. In addition, planning and contract development have also been completed on 65% of all potential 2019 projects. The entirety of this project is "shovel ready". 100% of all designs and contracting for all FY2019 contracts will be completed with 60 days of project approval.

The Ronan Field Office is not seeking any additional NRCS assistance to complete this project. 100% of design, planning and contracting will be completed by local field office staff and partners. Area, State and/or engineering staff will not be needed for planning or implementation of this project. Completing this large workload without assistance from other NRCS sources will increase NRCS capacity to build additional Targeted Implementation Projects in other counties.

Sources:

Confederated Salish and Kootenai Tribes, Water Quality Assessment Report. Confederated Salish and Kootenai Tribes Natural Resource Dept., June 2002.

Assessment of Water Quality Conditions on the Lower Flathead River. Confederated Salish and Kootenai Tribes Natural Resource Dept., January 2014

Assessment of Water Quality Conditions in the Crow Creek Watershed. Confederated Salish and Kootenai Tribes Natural Resource Dept., 2007

Farm Irrigation Rating Tool (FIRI). Version 2015.1.01. USDA, NRCS.

Ranking and Screening

Screening:

1. **Is the applicant in good standing with existing and/or completed program contracts within the last 3 years?**

2. **Is the proposed conservation treatment within the geographic boundaries of this Targeted Implementation Plan (TIP)?**

3. **Does this application meet the intent of the Targeted Implementation Plan (TIP) and is for practices currently offered in the TIP that will treat the identified priority resource concern?**

Ranking (400 points total):

Question 1:

Does this application improve water quantity by converting from flood irrigation to sprinkler irrigation (30% or more of the converted land must be currently flood irrigated to answer yes)?

Question 2:

Does this application include conversion to a pivot irrigation system?

Question 3:

3a. Are at least 75% of the treated acres in the field(s) in this application within 0.5 miles of a water body listed as impaired by CSKT.

3b. Are at least 75% of the treated acres in the field(s) in this application within 1.0 miles of a water body listed as impaired by CSKT.

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