

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" if no impacts are identified or the resource is not present.*

4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:

Consider the presence of fragile, compactable or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify direct, indirect, and cumulative effects to soils.

The DNRC mapped the soils resource for the pivot area using the NRCS Web Soil Survey application (<https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>). The primary soil types in the pivot area include: Chanta loam (estimated 28.4% of drawn area; 0 to 2 percent slopes), Ryell very fine sandy loam (22.7%, 0 to 2 percent slopes, rarely flooded), Havre-Bigsandy loams (15.1%, 0 to 2 percent slopes, frequently flooded), Marvan-Vanda silty clays (14.3%, 0 to 4 percent slopes), Vanda clay (14.1%, 0 to 2 percent slopes), Yamacall loam (4.6%, warm, 2 to 8 percent slopes), Yamacall loam (0.5%, warm, 0 to 2 percent slopes), and Tinsely gravelly sandy loam (0.3%, 8 to 35% percent slopes). Chanta loam and Yamacall loam soils are classified by NRCS as prime farmland if irrigated, and well-drained. Ryell very fine sandy loam and Yamacall loam soils are classified as Farmland of statewide importance, and well-drained. The remaining soil types are not considered prime farmland.

The pivot area is entirely within the Quaternary Alluvium – Alluvium of modern channels and floodplains geology (Vuke, S.M., and Colton, R.B., 2003, Geologic map of the Terry 30' x 60' quadrangle, eastern Montana, revised 2010: Montana Bureau of Mines and Geology, Open-File Reports MBMG-477, scale 1:100,000).

Proposed Alternative – The proposed project may have potentially adverse impacts to the soils resource given the pivot will dig wheel tracks through the proposed area; however, the soils may benefit from more efficient water use given many of the soil types are classified as 'prime farmland' or 'Farmland of statewide importance' and well drained.

No Action – No impact to soil resource with the current flood irrigation system.

5. WATER QUALITY, QUANTITY AND DISTRIBUTION:

Identify important surface or groundwater resources. Consider the potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify direct, indirect, and cumulative effects to water resources.

The proposed pivot area is located within the Lower Yellowstone-Sunday watershed (HUC8 10100001), which drains an area of approximately 4804.9 mi². The mean annual flow of the Yellowstone River at Miles City, MT (USGS 06309000) ranges from 6,141 ft³ s⁻¹ (in 1999) and 19,780 ft³ s⁻¹ (in 2011).

The proposed pivot area is in the Tullock Member (of Fort Union Formation) aquifer, which is the most extensive of the Fort Union Formation and composed of sandstone and mudstone (Madison et al., 2014 - MBMG Groundwater Assessment Atlas No. 3). There are no wells drilled in the direct project area; however, wells in the near vicinity have an approximate static water level of 80 feet

(<https://www.mbmgt.mtech.edu/mapper/mapper.asp?view=Wells&>).

The nearest water quality concern is the Yellowstone River, which is on the 303d list and classified by Montana DEQ as B3, or 'Waters classified B-3 are to be maintained suitable for drinking, culinary and food processing purposes after conventional treatment; bathing, swimming and recreation; growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply' (Montana DEQ List of Montana Impaired Waters 2020). In addition, the Yellowstone is a 'Category 5' stream for water quality. The Montana DEQ specifies those waters classified as a Category 5 as, 'Waters where one or more applicable beneficial uses have been assessed as being impaired or threatened, and a TMDL is required to address the factors causing the impairment or threat.' The Yellowstone River is impaired in pH, Copper, Zinc, Nitrate/Nitrite, Sediment, Total Dissolved Solids, and Lead. Other 'Non-Pollutant Causes' include alterations in stream-side or littoral vegetation.

Proposed Alternative – The proposed project will be potentially beneficial as the change from flood to pivot irrigation will likely conserve water through more efficient water delivery. In addition, the more direct application of water from the pivot may decrease overland flow of water, and thus reduce sedimentation and nutrient loading to nearby streams.

No Action – The no action alternative is the continued use of flood irrigation, which often uses more water and is less efficient. Because of potential excess water from flooding, nearby streams will likely continue to be impacted by sedimentation and/or nutrient loading.

6. AIR QUALITY:

What pollutants or particulate would be produced (i.e. particulate matter from road use or harvesting, slash pile burning, prescribed burning, etc)? Identify the Airshed and Impact Zone (if any) according to the Montana/Idaho Airshed Group. Identify direct, indirect, and cumulative effects to air quality.

The project area is not listed as impaired in air quality particulates per the Montana DEQ Air Quality Nonattainment Status list (Source: Montana DEQ Air Quality Website visit).

Proposed Alternative – No impact is expected to surrounding air quality. If there are any air quality impacts associated with construction, these impacts will likely be minor and short-term.

No Action – No impact to current air quality.

7. VEGETATION COVER, QUANTITY AND QUALITY:

What changes would the action cause to vegetative communities? Consider rare plants or cover types that would be affected. Identify direct, indirect, and cumulative effects to vegetation.

The project area is primarily within private, cultivated cropland (Montana Natural Heritage Program MapViewer). Cultivated croplands and Great Plains Mixedgrass Prairie, and Great Plains Floodplain are the dominant land covers, followed by Great Plains Badlands, Introduced Riparian and Wetland vegetation, Open Water, and Great Plains Sand Prairie. There are 11 plants listed as State Species of Concern and one species listed as Potential Species of Concern for Custer County (Montana Natural Heritage Program).

Proposed Alternative – The proposed project area is entirely within cultivated cropland and would likely have no impact to State-listed plant Species of Concern; however, more efficient water distribution would likely prove beneficial to the introduced crops within the pivot area.

No Action – No impact to vegetation cover, quantity, or quality.

8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:

Consider substantial habitat values and use of the area by wildlife, birds or fish. Identify direct, indirect, and cumulative effects to fish and wildlife.

The project area does not appear to be within crucial and/or critical habitat areas. There are 49 Animal Species of Concern, and one Special Status Species, the Bald Eagle, listed as occurring in Custer County. Greater sage-grouse is the only Species of Concern listed that may occur in the project area (Montana Natural Heritage Program); however, DNRC confirmed the project area was not located in an Executive Order – General habitat area for Greater sage-grouse using the DNRC Montana Sage Grouse Habitat Conservation Map (sagegrouse.mt.gov; USFWS Greater sage-grouse maps - <https://www.fws.gov/greatersagegrouse/maps.php>). Indeed, the project area is in Sections just outside of their habitat range. While the sections in the project area are not in the immediate vicinity of the Yellowstone River, the Lower Yellowstone watershed is listed as an aquatic focal area for conservation under Montana Fish, Wildlife, and Parks State Wildlife Action Plan (SWAP 2015).

Proposed Alternative – The proposed alternative appears to have no impact to critical terrestrial, avian, or aquatic habitats. There are no plant species of concern listed in the project area and only two animals of concern listed as potentially occurring in the project area, but DNRC confirmed the project PLSS sections were outside of the general habitat range for Greater sage-grouse.

No Action – No impact to terrestrial, avian, or aquatic habitats.

9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:

Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of special concern. Identify direct, indirect, and cumulative effects to these species and their habitat.

The Bald Eagle and Greater sage grouse are two species listed as potentially occurring in Custer County (Montana Natural Heritage Program; DNRC Sage Grouse Habitat Conservation Program). In addition, the Yellowstone River is an aquatic focal area for conservation under Montana Fish, Wildlife, and Parks State Wildlife Action Plan (2015). There appear to be limited, to no wetlands present in the immediate area of the proposed pivot location (USFWS Wetlands Mapper).

Proposed Alternative – The proposed project will be potentially beneficial as pivot irrigation likely conserves water given its more efficient delivery. As such, there may be water conservation for the benefit of the Yellowstone River. The change from flood irrigation will also benefit by increased water quality given the potential reduction in sedimentation and nutrient loading.

No Action – No impact to unique, endangered, fragile, or limited environmental resources.

10. HISTORICAL AND ARCHAEOLOGICAL SITES:

Identify and determine direct, indirect, and cumulative effects to historical, archaeological or paleontological resources.

The project area is primarily on private, cropland and irrigated fields with no known historic or archeological resources in the area.

Proposed Alternative – No impact is expected as there have been no historic or archaeological resources identified in the proposed project area. If previously unknown cultural or paleontological materials are identified during project related activities, the DNRC grant manager will be notified, and all work will cease until a professional assessment of such resources can be made.

No Action – No impact to historical or archaeological sites.

11. AESTHETICS:

Determine if the project is located on a prominent topographic feature, or may be visible from populated or scenic areas. What level of noise, light or visual change would be produced? Identify direct, indirect, and cumulative effects to aesthetics.

The project area is on rural private property which is comprised primarily of cultivated cropland and/or Great Plains Mixedgrass Prairie. In addition, the project is approximately 9.25 miles northeast from the city of Miles City, and therefore outside of populated, residential areas.

Proposed Alternative – There may be minimal adverse impacts given the pivot is a large sprinkler; however, the project will cause minimal nuisance (e.g., glare, fumes) as the proposed project is on private lands.

No Action – no impact to aesthetics.

12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:

Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify direct, indirect, and cumulative effects to environmental resources.

The project will include the supply and delivery of a 1,298 ft Reinke Center Pivot that will provide irrigation coverage of approximately 141 acres. PVC mainline and cable will be trenched from the pivot point approximately 2,000 ft to the proposed pump site. The proposed pump site will include electrical components and will be consolidated to provide the smallest effective footprint for ease of construction of cattle protection structures. The Flooded suction pump will be fed via 12" underground pipeline by a precast concrete headwall structure with headgate which would be installed in the ditch bank. Guides will be cast into the concrete and allow the First street welding self-cleaning screen to slide into the wet well which will rotate during operation and spray debris off the intake screen. A 60 hp Cornell centrifugal pump will be mounted on a stand on a concrete pad which will supply the center pivot. A Steel I beam fabricated, 480 V Single phase electrical meter pedestal will be installed at the pump site for MDU to feed with electricity.

Proposed Alternative – Potentially adverse impacts to demand on energy resources as the system requires electricity to run the irrigation pivot pump; however, given the system relies on natural pressure head, the impacts may be minimal. There will also be a beneficial impact to water resources given this system appears to be more efficient at water delivery and perhaps less demand for water in the long-term.

No Action – The current flood irrigation system likely demands more water and is less efficient at

distribution for crops. The no action alternative will continue to demand increased water delivery.

13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:

List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.

The project area does not have any wetlands in the immediate vicinity; however, a freshwater pond is nearby and may require a pre-application consultation with the U.S. Army Corps of Engineers to determine if a 404 Permit is required.

IV. IMPACTS ON THE HUMAN POPULATION
<ul style="list-style-type: none">• <i>RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.</i>• <i>Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.</i>• <i>Enter "NONE" if no impacts are identified or the resource is not present.</i>

14. HUMAN HEALTH AND SAFETY:

Identify any health and safety risks posed by the project.

The project implements floodplain irrigation on private crop- and pastureland.

Proposed Alternative – Potentially beneficial as the project proposes to use a pivot irrigation system controlled by either a remote application or going to the pivot point to start the pivot. The pump control will be wired to automatically start from the pivot point (or remote control) as well as shut off the pump if inadequate pressures are observed. The operator select the depth of the required application or the speed, verifies directions, and presses start.

No Action – No impact to human health and safety.

15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:

Identify how the project would add to or alter these activities.

The project is on irrigated, rural farmland where the primary crop produced from the irrigated area is alfalfa. The project area irrigates a total of 136 acres. As of August 2021, alfalfa square bales sell at \$300/ton and round bales sell at \$200/ton in Miles City, Montana.

Proposed Alternative – Potentially beneficial as the pivot increases both water efficiency and distribution. The increase in water efficiency and distribution will likely produce more alfalfa and thus more revenues. The 2022, 2023, and 2024 estimated gross income for four tons of alfalfa is approximately \$70,720.00, \$76,160.00, and \$81,600, respectively.

No Action – The project proponent will continue to use floodplain irrigation for alfalfa crop production, which provides less water efficiency and distribution is poor. The poor distribution may prove additionally detrimental during drought, due to excessive evaporation or other natural loss, and thus significantly impacting crop production.

16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:

Estimate the number of jobs the project would create, move or eliminate. Identify direct, indirect, and cumulative effects to the employment market.

The landowners (applicant) install and maintain the current infrastructure on the farmlands.

Proposed alternative – Potentially beneficial, short-term impact as the installation would be performed by local contractors. In addition, the additional production of alfalfa may create more transportation need.

No Action – No impact to quantity and distribution of employment.

17. LOCAL AND STATE TAX BASE AND TAX REVENUES:

Estimate tax revenue the project would create or eliminate. Identify direct, indirect, and cumulative effects to taxes and revenue.

Current value from grazing, irrigated, farmsite, and Total Agricultural Land is approximately \$236,906 (Sheet attached in application). The taxable value of the properties owned by the applicant appear to be \$5,005 in 2020 and \$4,727 in 2021 (Montana Property Assessment Division, <https://svc.mt.gov/dor/property>).

Proposed Alternative – Potentially beneficial as the proposed alternative will provide more efficient water delivery and distribution, thus increasing crop production. Given the crop product (alfalfa) appears to be sold within Miles City (see attached application), there is likely local and state revenue benefit through the selling of hay for livestock.

No Action – No impact is expected to local and state tax base and tax revenues.

18. DEMAND FOR GOVERNMENT SERVICES:

Estimate increases in traffic and changes to traffic patterns. What changes would be needed to fire protection, police, schools, etc.? Identify direct, indirect, and cumulative effects of this and other projects on government services

The project is on rural, private farm- and pastureland and approximately 9.25 miles to the northeast of Miles City.

Proposed Alternative – No impact to demand for government services.

No Action – No impact to demand for government services.

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.

The project is on rural, private farm- and pastureland and any action is voluntarily adopting any local environmental plans. The proposed area is not within critical habitat for Sage Grouse or other

sensitive species, and therefore not subject to necessary permits/coordination with state agencies. There are no other known zoning or management plans for the proposed area.

Proposed Alternative – No impact to locally adopted environmental plans or goals.

No Action – No impact to locally adopted environmental plans or goals.

20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:

Identify any wilderness or recreational areas nearby or access routes through this tract.

Determine the effects of the project on recreational potential within the tract. Identify direct, indirect, and cumulative effects to recreational and wilderness activities.

The project is on rural, private farm- and pastureland. While the Yellowstone river corridor is within one mile of the project area, it is not in direct access to the river.

Proposed Alternative – No direct impact to access to or quality of recreational and/or wilderness activities; however, there may be indirect, cumulative impact to water quantity given the water rights cover usage from the Yellowstone and Tongue Rivers, which may affect boating, fishing, or any other recreational activities occurring on either the Yellowstone or Tongue Rivers.

No Action – Similar to the proposed alternative, flood irrigation may prove to have to no direct impact to access to or quality of recreational and/or wilderness activities; however, there may be indirect, cumulative impact to water quantity given the water rights cover usage from the Yellowstone and Tongue Rivers, which may affect boating, fishing, or any other recreational activities occurring on either the Yellowstone or Tongue Rivers.

21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:

Estimate population changes and additional housing the project would require. Identify direct, indirect, and cumulative effects to population and housing.

The population of Custer County in 2020 was estimated at 11,292 individuals, and the City of Miles City was estimated at 8,181 individuals (-0.6% decline for both County and City; MT Dept. of Commerce: <http://ceic.mt.gov>). In addition, there are approximately 5,700 housing units in Custer County (<https://ceic.mt.gov/Maps/Housing/OwnerOccupied>).

Proposed Alternative – No impact is expected to the county population. Given the project is expected to be short-term and performed by the applicant/landowner and local contractor, no additional housing is expected.

No Action – No impact to density and distribution of population and housing.

22. SOCIAL STRUCTURES AND MORES:

Identify potential disruption of native or traditional lifestyles or communities.

The project area is largely made up of rural, cultivated cropland and/or Great Plains mixedgrass prairie (Source: Montana Natural Heritage Program). The agricultural way of life provides the most common type of lifestyle/community for the county.

Proposed Alternative – No impact is expected to change social structures and/or lifestyles from the project, but it may enhance the current communities and lifestyles. By creating more efficient water delivery, the project will likely conserve groundwater and/or surface water sources. Increased efficiency and conserved water will create benefits locally, regionally, and statewide in the form of increased livestock food supply, improved recreational opportunities, and economic impacts.

No Action – No impact to social structures is likely given the area is primarily on private land.

23. CULTURAL UNIQUENESS AND DIVERSITY:

How would the action affect any unique quality of the area?

Agricultural lands sustain the way of life for Custer County and the greater Miles City area, providing local and regional food supply for the overall area.

Proposed Alternative – No impact is expected to the cultural uniqueness and/or diversity to the project area given the project is on private land.

No Action – No impact to cultural uniqueness or diversity resources.

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:

Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify direct, indirect, and cumulative economic and social effects likely to occur as a result of the proposed action.

The proposed project is located on private land and there are no defined management strategies benefiting the current social and economic circumstances of the area.

Proposed Alternative – No impact is expected to additional social or economic circumstances as the project is on private lands; however, more efficient watering facilities may increase livestock production to some extent and therefore benefit the local area for a long-term, cumulative impact.

No Action – No impact to social or economic circumstance.