APPENDIX 4:

Wetland Impacts and Mitigation Technical Memorandum

NINEPIPE CORRIDOR 93 FEASIBILITY STUDY

HERRERA

TECHNICAL MEMORANDUM

Date: October 21, 2022

To: Sarah Nicolai, PE, PTP and Scott Randall, PT, PTOE; Robert Peccia and Associates

From: Susan Wall

Subject: Wetland Impacts and Mitigation for the Ninepipe Feasibility Study

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INTRODUCTION

This memorandum was prepared for Montana Department of Transportation (MDT) to document potential wetland impacts, mitigation approach and costs for the US 93 Ninepipe Feasibility Study. Wetland boundaries and functional assessments in the Ninepipe Segment were reviewed and minor boundary adjustments were made in July 2021 during the wetland reconnaissance performed for the feasibility study (Herrera 2021). There were no major changes in wetland boundaries compared to the delineation presented in the 2008 Supplemental Environmental Impact Statement (SEIS). Minor changes were noted where new wetlands had formed in roadside ditches and where existing wetland boundaries were modified to reflect current conditions. Functional assessment ratings of four wetlands changed from Category III to Category IV; in all other cases the ratings remained the same as those presented in the SEIS.

The wetland reconnaissance study reviewed surface water connections with waters of the United States (WOTUS) in accordance with the 2021 interpretation of the Clean Water Act. Based on this study, a preliminary review was conducted for jurisdictional and non-jurisdictional status of wetlands in the Ninepipe study corridor.

IMPACTS

Impact calculations shown in the tables below are based on the baseline roadway configuration developed by Robert Peccia and Associates (RPA) for the feasibility study. This alignment reflects elements identified for the 2008 SEIS and associated design criteria outlined in the *MDT Road Design Manual* (RDM), *MDT Geometric Design Standards*, and the *Baseline Criteria Practitioners Guide*. Tables showing baseline impacts on each wetland are included in Appendix A and figures showing wetlands mapped in the corridor are included in Appendix B.

The impact areas presented below would sustain permanent impacts due to roadway construction and construction of the shared use path. Impacts would change under the alternatives developed for wildlife accommodations as described in the Comparison of Baseline Design and Alternatives section. Precise wetland impact quantities would be determined in the design phase if projects advance from the feasibility study.

Temporary impacts would occur due to vegetation clearing and soil disturbance during roadway construction and for detours during construction of bridges. These impacts would be minimized by the use of best management practices, as described in the Mitigation section below, and by restoring disturbed areas with native vegetation.

Impacts by Wetland Type

Impacted acres are grouped in the sections below by wetland type, US Fish and Wildlife Service (USFWS) classification, functional assessment rating, and jurisdictional status. These groupings

can be used to assist in determining appropriate compensatory mitigation for permanent, unavoidable wetland impacts.

Pothole Wetlands

Pothole wetlands are depressions formed by the melting of an isolated block of glacial ice. For purposes of this assessment, pothole wetlands in the project corridor are divided into three groups as presented in the SEIS, based on water regime modifiers described by Cowardin et al. (1979). Group 1 pothole wetlands are inundated by precipitation, surface water runoff, and/or ground water inflow all year. Group 1 pothole wetlands include permanently flooded, intermittently exposed, and semi permanently flooded water regimes. This group includes Kettle Ponds 1 and 2. Group 2 pothole wetlands are usually saturated at or near the soil surface for all or most of the year and inundated for portions of the year. Group 2 pothole wetlands include seasonally flooded and saturated water regimes. Group 3 pothole wetlands are depression areas that are inundated periodically, but with much longer lengths of time between inundations. Group 3 pothole wetlands include temporarily flooded and intermittently flooded water regimes lacking open water habitat.

Other Wetland Types

The other wetland types include open water (Ninepipe Reservoir), irrigation canals and associated wetlands, riparian wetlands and roadside ditches. Irrigation features include the Ninepipe Feeder Canal and the Post A canal. Riparian wetlands associated with Crow Creek are in the floodplains, outside of the stream channel. Initial wetland impact estimates for each wetland type are shown in Table 1.

Table 1. Impacts by Wetland Type.

Wetland Type	Impacts (acres)
Group 1 pothole	7.32
Group 2 pothole	0.45
Group 3 pothole	0.22
Irrigation features	0.02
Ninepipe Reservoir	5.24
Crow Creek riparian zone	0.44
Roadside ditches	1.66
Total	**15.35**

Impacts by USFWS Classification

The USFWS classifies wetlands according to *Deepwater Habitats of the United States* (Cowardin et al. 1979), a descriptive classification with 28 subclasses, based on physical wetland attributes (i.e., vegetation, soils, and water regime). These groupings are useful in evaluating impacts and

appropriate potential mitigation to satisfy US Army Corps of Engineers (USACE) and Confederated Salish and Kootenai Tribes (CSKT) requirements.

According to Cowardin et al. (1979), all wetlands in the project corridor are palustrine wetlands. Palustrine wetlands are wetland systems with vegetation dominated by trees, shrubs, herbaceous plants, mosses or lichens. Two deep-water systems are also present in the project corridor – riverine (Crow Creek) and lacustrine systems (Ninepipe Reservoir). Riverine and lacustrine systems are not typically classified as wetlands as defined by the USACE Wetlands Delineation Manual (Environmental Laboratory 1987) but these WOTUS are regulated under Section 404 of the Clean Water Act.

Many of the wetlands in the Ninepipe segment contain more than one wetland class. For the purposes of this study any wetlands that contain areas of scrub-shrub or forested vegetation are included in the scrub-shrub and forested category below (Table 2); these wetlands also contain some emergent, aquatic bed and unconsolidated bottom (open water) areas.

Table 2. Wetland Impacts by USFWS Classification.

Classification	Definition	Impacts (acres)
Emergent	Wetlands with the uppermost vegetation layer comprised of 30 percent cover or more of erect rooted herbaceous plants	1.16
Aquatic Bed	Wetlands with 30 percent or more of the substrate composed of plants that principally grow below the surface of the water	1.51
Emergent and Unconsolidated Bottom (Open Water)	Wetlands that contain a mix of areas dominated by emergent vegetation and open water areas (vegetated cover less than 30 percent and substrate with 25 percent particles smaller than stones)	11.1
Emergent, Aquatic Bed and Open Water	Wetlands that contain a mix of these vegetation classes.	0.45
Scrub-shrub and Forested	Wetlands with 30 percent cover or more of woody vegetation less than 20 feet tall (scrub-shrub), and woody vegetation 20 feet or taller (forested)	1.13
Total		**15.35**

Impacts by MWAM Rating

Functions and values of wetlands within the Ninepipe segment were assessed using the Montana Wetland Assessment Method (Berglund and McEldowney 2008) and reported on in 2021 (Herrera 2021). This method was developed to evaluate functions and values of wetlands within an assessment area and to provide a means for assigning an overall rating to a wetland. The method was established primarily to address highway and other linear projects. Montana wetland category hierarchy ranges from Category I wetlands, which exhibit outstanding features (e.g., large wetlands that provide habitat for threatened or endangered species or large volumes of flood attenuation) to Category IV wetlands, which exhibit minimal attributes (e.g., isolated wetlands dominated by one plant species) (Table 3). USACE and CSKT consider impacts to

wetland functions and values when evaluating potential mitigation for unavoidable wetland impacts.

Table 3. Wetland Impacts by MWAM Rating.

Rating	Impacts (acres)
Category I	0.00
Category II	12.25
Category III	1.55
Category IV	1.55
Total	**15.35**

Impacts by USACE Preliminary Jurisdictional Status

Wetlands in the project area were reviewed by the project biologist in 2021 for jurisdictional or non-jurisdictional status as regulated by the USACE (Table 4). Final jurisdictional determinations would need to be verified by the USACE. MDT would not be responsible for mitigating impacts on non-jurisdictional wetlands for the purposes of securing a Section 404 permit. However, regardless of jurisdiction, Executive Order 11990 requires MDT to account for all wetland losses. Therefore, MDT would ultimately seek to replace all wetlands affected by the proposed project.

Table 4. Wetland Impacts by Preliminary USACE Jurisdictional Status.

Preliminary Status	Impacts (acres)
Non-jurisdictional	8.13
Jurisdictional	7.22
Total	**15.35**

Comparison of Baseline Design and Alternatives

The feasibility study suggests several potential modifications from the preferred alternative in the SEIS that would offer greater potential for wildlife to safely cross the highway and would affect impacts on wetlands and WOTUS. Proposed modifications to the shared use path (SUP), modifications to slopes, and modifications to optimized wildlife connectivity were presented for MDT and stakeholder review. Based on input received a new option to add a wildlife overpass was added to the study. The alternatives being put forward for feasibility analysis include the SEIS preferred alternative; an alternative that includes enlarged structures at Ninepipe Reservoir, the Kettle Ponds and Crow Creek, as well as steepened fill slopes and a SUP alignment primarily along the east side of US 93; and an alternative that includes the above fill slope and SUP configurations and adds a wildlife overpass and different modifications of wildlife crossing structures. Details for each alternative are shown in the figures in Appendix C and described below:

C-1: SEIS Preferred:

- Typical Section: Standard 6:1 inslopes with standard fill slopes
- Shared Use Path: SUP with crossing north of Kettle Pond 2
- Ninepipe Reservoir: Single 660-foot bridge with 10 to 12 feet of vertical clearance, two 12x22-foot culverts, and two 10x12-foot culverts
- Kettle Pond 1: Two 60-foot bridges with 10 to 12 feet of vertical clearance and two 4x6-foot culverts
- Kettle Pond 2: Two 60-foot bridges with 10 to 12 feet of vertical clearance and two 4x6-foot culverts
- Crow Creek: Two bridges (120-foot and 150-foot) with 10 to 12 feet of vertical clearance

CI-2: Enlarged Wildlife Crossing Structures:

- Typical Section: Standard 6:1 inslopes with steepened 3:1 fill slopes
- Shared Use Path: SUP with crossing south of Ninepipe Reservoir
- Ninepipe Reservoir: Single 660-foot bridge with 15 feet of vertical clearance, two 12x22-foot culverts, and two 10x12-foot culverts
- Kettle Pond 1: Single 800-foot bridge with 15 feet of vertical clearance
- Kettle Pond 2: Single 800-foot bridge with 15 feet of vertical clearance
- Crow Creek: Single 500-foot bridge with 15 feet of vertical clearance

CII-3: Wildlife Overpass Configuration:

- Typical Section: Standard 6:1 inslopes with steepened 3:1 fill slopes
- Shared Use Path: SUP with crossing south of Ninepipe Reservoir
- Ninepipe Reservoir: Single 300-foot bridge with 15 feet of vertical clearance, two 12x22-foot culverts, and two 10x12-foot culverts
- Post A Canal: Wildlife overpass
- Kettle Pond 1: Single 110-foot bridge with 10 to 12 feet of vertical clearance and two 4x6-foot culverts

- Kettle Pond 2: Single 110-foot bridge with 10 to 12 feet of vertical clearance and two 4x6-foot culverts

- Crow Creek: Single 500-foot bridge with 15 feet of vertical clearance

Steepened Slopes

The baseline design uses 6:1 in-slopes with standard fill slopes for ditch configuration which reflect the design standard and are desirable from a geotechnical perspective. Alternatives C-2 and C-3 propose 3:1 fill slopes throughout most of the corridor, and 2:1 slopes with guardrail and/or retaining walls at select locations. These steeper slopes would reduce the width of the roadway footprint and consequently reduce impacts on wetlands but would be more difficult and costly to construct.

Ninepipe Reservoir

At the Ninepipe Reservoir the baseline design calls for a 660-foot bridge with 10 to 12 feet of vertical clearance. Alternative C-2 would have less wetland impact than Alternative C-1 by spanning more of the adjacent wetlands; Alternative C-3 would have about the same impact as Alternative C-1. Temporary impacts for a detour east of the highway would be the same for each option.

Kettle Ponds

At Kettle Ponds 1 and 2 Alternative C-1 calls for two 60-foot-long structures with 10 to 12-foot clearance at each pond. This would result in permanent wetland impacts due to additional fill for roadway widening between the bridges. There would be temporary wetland impacts during construction for detours that would be located within the construction limits.

Alternative C-2 includes single 800-foot-long structures with 15-foot vertical clearance to increase the potential for large mammals to cross the highway safely. This would greatly reduce permanent impacts by spanning the ponds. Alternative C-3, with single bridges that are shorter, with less vertical clearance than Alternative C-2, would have less wetland impacts than Alternative C-1 and more than Alternative C-2. Temporary wetland impacts would be avoided by routing detours east of the kettle ponds, away from wetlands.

Crow Creek

At Crow Creek the baseline design calls for two bridges, 120 to 150 feet in length. Alternatives C-2 and C-3 replace the two bridges with a single 500-foot bridge to facilitate wildlife movements. These alternatives would reduce wetland impacts by spanning wetlands adjacent to the creek. Temporary wetland impact for a westside detour would be the same under all alternatives.

Summary of Wetland Impacts by Alternative

The wetland impact estimates provided in Table 5 are provided only to enable comparison between the baseline (Alternative C-1) and the proposed alternatives at select locations, and to understand the relative extent of impacts for the entire corridor.

Table 5. Comparison of Wetland Impacts by Alternative

Location	Alternative C-1 Wetland Impacts (Acres)	Alternative C-2 Wetland Impacts (Acres)	Alternative C-3 Wetland Impacts (Acres)
Ninepipe Reservoir	5.24	4.01	5.25
Kettle Pond 1	2.17	0.15	0.77
Kettle Pond 2	1.77	0.03	0.45
Crow Creek	0.42	0.13	0.13
Total Corridor-wide Wetland Impacts	15.35	8.84	11.20

MITIGATION APPROACH

Avoidance and Minimization Measures Included in Design

The 2008 SEIS Record of Decision includes additional recommended measures to minimize wetland and WOTUS impacts including:

- adherence to MDT standard specifications and best management practices (BMPs),
- installation of preservation fencing around wetlands and streams outside permitted impact areas,
- following the Evaro to Polson Integrated Invasive Weed Management Plan (CSKT 1993),
- salvaging native wetland vegetation from construction areas for use in revegetation,
- reducing peak flows from newly developed impervious areas into Category I and II wetlands and associated streams,
- including stormwater retention systems as necessary.

MDT requires that all construction activities within and adjacent to wetlands adhere to the BMPs outlined in the MDT standard specifications and described in the Stormwater Pollution Prevention Plan (SWPPP), which is prepared for all projects disturbing more than 1 acre of land area. This plan requires a description of BMPs to reduce soil erosion, to reduce site sediment loss, and to manage construction generated wastes, thereby reducing the risk to water quality in project area wetlands.

The MDT standard specifications place numerous restrictions on the contractor's activities to avoid and minimize impacts on aquatic resources. For example, avoidance is achieved by limiting certain activities to upland areas rather than wetlands when feasible. Limiting the total area that may be disturbed at any one time and seeding exposed soils as soon as practicable after work is complete minimizes the potential for increased deposition of eroded sediments in wetlands.

Compensation

Compensation for unavoidable permanent impacts on wetlands would involve mitigation to offset the impacts to satisfy USACE, CSKT, Montana Department of Environmental Quality (DEQ), USFWS and Montana Fish Wildlife and Parks (MFWP). If projects move forward from the feasibility study, and preliminary construction and right-of-way limits are determined, wetland mitigation strategies and estimates of wetland mitigation credits needed will be determined in cooperation with these agencies. Wetlands within the right-of-way that are temporarily affected by construction but not permanently filled may re-establish themselves after completion of construction activities and would not require compensatory mitigation.

MDT maintains separate crediting ledgers for USACE and CSKT to meet mitigation requirements. These requirements and compensation ratios are generally described below. If projects advance from the feasibility study, precise compensatory wetland mitigation strategies would be determined in the design phase.

USACE Compensatory Mitigation Crediting

The USACE requires that unavoidable losses of over 0.10 acre of jurisdictional wetlands and any unavoidable stream impacts over 0.03 acre be compensated at a minimum ratio of 1:1 (USACE 2021). The USACE and Environmental Protection Agency (EPA) order of preference for providing compensatory mitigation is 1) mitigation banks; 2) in-lieu fee programs and 3) permittee-responsible mitigation. As stated above, under the national No Net Loss policy (Executive Order 11990) MDT would seek to compensate for all unavoidable wetland impacts regardless of jurisdictional status.

For any future projects in the Ninepipe segment MDT would seek to use the credit balance from existing certified mitigation sites if available in the appropriate watershed (Lower Clark Fork – Watershed 3). MDT is currently working to get additional mitigation sites certified for USACE credits.

If credits are not available for future projects, MDT would seek to purchase credits if available from a mitigation bank or in-lieu fee program. Permittee-responsible mitigation would only be used if none of the other options are available.

For illustrative purposes, Table 6 presents the potential USACE compensation ratios for any future projects in the Ninepipe segment. The credit ratios shown in Table 6 for permittee responsible mitigation are based on the ratios used for the US 93 Evaro to Polson project and would have to be confirmed in consultation with the appropriate agencies.

Table 6. Minimum Compensation Ratios Required by USACE for Unavoidable Wetland Impacts.

Mitigation Category	Definition	Ratio
MDT and CSKT mitigation reserves	Use existing credit balance at approved mitigation sites	1:1
Mitigation bank	Purchase of credits from a mitigation bank	1:1
In-lieu fee program	Purchase of credits from an in-lieu fee program	1.5:1
Permittee Responsible–Creation[a]	Establishment of a wetland or other aquatic resource where one did not formerly exist	1:1
Permittee Responsible–Re-establishment[a]	Restoration of wetland characteristics to existing non-wetland areas that were historically wetlands	1:1
Permittee Responsible–Rehabilitation[a]	Restoration of wetland functions at existing wetland areas that exist in a substantially degraded state	Based on expected functional shift. A minimum 1.5:1 ratio applies
Permittee Responsible–Enhancement[a]	Altering the physical characteristics of a jurisdictional wetland such that it permanently modifies and improves one or more specific functions	Based on expected functional shift A minimum 3:1 ratio applies

a letter to Tom Martin, Consultant Design Engineer Montana Department of Transportation from Kathleen Adams, Herrera, dated September 1, 2004. Subject: US 93 Evaro to Polson highway reconstruction project: On-site wetland mitigation crediting.

CSKT Compensatory Mitigation Crediting

The CSKT Aquatic Lands Conservation Ordinance 87A regulates "construction or installation of projects upon aquatic lands whenever such projects may cause erosion, sedimentation, or other disturbances adversely affecting the quality of Reservation waters and aquatic lands (CSKT 1986)." The ordinance applies to all wetlands, regardless of USACE jurisdiction. The CSKT Wetland Conservation Plan for the Flathead Indian Reservation (CSKT 1999) requires unavoidable impacts on all wetlands to be compensated at a greater than 1:1 ratio by preserving, restoring, creating, or enhancing wetlands (Table 7).

Table 7. Pre-project Compensation Ratios Required by CSKT for Unavoidable Wetland Impacts.

Impacted Wetland Type	Preservation	Restoration	Enhancement	Creation
Forested and Shrub	3:1	2.5:1	4:1	4:1
Emergent and Open Water	2:1	1.5:1	3:1	3:1

Source: CSKT 1999

In the past MDT has used approved mitigation sites within the Flathead Reservation for wetland mitigation for projects located within the US 93 Evaro to Polson corridor. MDT is currently working with the CSKT on approval of the remaining CSKT credits at these sites (personal communication, Larry Urban, MDT Wetland Mitigation Specialist, June 2022).

MITIGATION COST

It is not known how many, if any, certified credits will be available for USACE and CSKT mitigation in the future, and it is unlikely that any credits available will be sufficient to cover the entire Ninepipe segment. Therefore, MDT would seek to purchase any additional needed credits at a mitigation bank or through an in-lieu fee program. Currently there are no private mitigation banks that serve the Lower Clark Fork watershed. Montana Freshwater Partners (MFP) operates an in-lieu fee program that serves the entire state for wetland and stream mitigation. The cost for purchasing in-lieu credits from MFP is currently about $110,500 per acre (personal communication, William Semmens, MDT Resources Section Supervisor, June 2022).

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APPENDIX B

Wetland Mapping

Legend

- Wetland Sample Plots
- Updated Wetland Boundary
- Existing Wetland
- Roads

Figure A-7
Updated Wetland Boundaries for the Ninepipe Corridor Feasibility Study.

0 50 100 200 Feet

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