Aquatic Resources Delineation Report

Bridge G-12-C

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Executive Summary

Stanley Consultants, Inc. (Stanley), has prepared an aquatic resources delineation for a proposed replacement of a concrete culvert on Colorado State Highway (CO) 9 near Alma, Colorado, known as the G-12-C Bridge Replacement Project (the Project). The purpose of the delineation is to identify any potential waters of the U.S. (WOTUS) and wetlands with the potential to be impacted by Project activities. The delineation was conducted in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (U.S. Army Corps of Engineers [USACE] 2010).

This delineation reports on the finding at the Colorado Department of Transportation (CDOT) bridge G-12-C survey area (2.6 acres), where three riparian wetlands (PSS: 0.02, 0.06. and 0.04 acres) were recorded along with the OHWM for the Middle Fork of the South Platte River (R3UB1H: 0.14 acres and 243 linear feet [ft]) and a small adjacent drainage (R5UB3H: 0.02 acres and 171 linear ft) that flows into the river. The wetlands directly abut or are below the river OHWM and are dominated by willows and rushes. The Middle Fork of the South Platte River is a perennial water containing areas of riparian habitats, braided channels, and other wetlands including a potential fen wetland approximately 0.22 miles to the north. The small drainage observed appears to drain not only the edge of the roadway but also small seeps from the adjacent hillside. This drainage is mostly vegetated with various willows.

The delineation findings presented in this report will be used to assess potential Project impacts to surface water resources. The findings may be used to develop Project designs that minimize or avoid impacts to surface waters resources or, if impacts to these resources are unavoidable, to understand the total anticipated impacts that would need to be approved or permitted by the USACE. Depending on the level of impacts, the Project would likely require permitting under the Nationwide Permit (NWP) program or through an Individual Permit. The NWP program is available for projects with relatively minor impacts, while Individual Permits are required for projects with larger impacts and can involve a lengthy permitting process.

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Acronyms and Abbreviations

CDOT	Colorado Department of Transportation
CO	Colorado State Highway
MP	Mile Post
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NWP	Nationwide Perit
NWPL	National Wetland Plant List
OHWM	ordinary high-water mark
PSS	palustrine scrub-shrub
ROW	right-of-way
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WOTUS	Waters of the United States

1. Introduction

On behalf of the Colorado Department of Transportation (CDOT), Stanley Consultants, Inc. (Stanley) has prepared an aquatic resources delineation for the proposed replacement of a concrete culvert on Colorado State Highway (CO) 9 near Alma, Colorado, known as the G-12-C Bridge Replacement Project (Project). The purpose of the delineation is to identify any potential waters of the U.S. (WOTUS) and/or wetlands, present within the area of potential Project impacts.

The presence of wetlands and other waters were assessed within the vicinity of the proposed Project construction. The boundaries of potential WOTUS were then delineated to determine the extent of waters subject to regulation under the Clean Water Act within the area of potential Project impacts. The purpose of this delineation report is to facilitate efforts to:

- Avoid or minimize impacts to aquatic resources during the design process.
- Document aquatic resource boundary determinations for review by regulatory authorities.

Field investigations were conducted on August 28 and September 21, 2020, by wetland biologists for Stanley Consultants, Inc.

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2. Location and Project Description

2.1 Location

The surveyed Project area, to be referred to as the Potential Impact Area (PIA), is based on the area of potential Project-related impacts per communications with Project engineers, and is approximately 2.6 acres. The PIA is contained within the CDOT right-of-way (ROW), along CO 9 and includes an existing concrete double culvert that currently allows traffic to cross the Middle Fork of the South Platte River. The culvert is located approximately 0.5 miles north of the town center of Alma, Colorado (39.294857/-106.065597), in Section 1, Township 9S, Range 78W (6th Principal Base and Meridian). A map of the PIA is located in the Aquatic Resources Delineation Map in Appendix A.

2.2 Purpose and Need

The double culvert (Structure G-12-C) was built in 1938 on CO 9 which is a key corridor connecting residents and tourists from Colorado Springs and southern Colorado to the recreational activities in the Rocky Mountains. The structure is in poor condition, requiring frequent inspection and repair, including patching of concrete and replacement of wing walls. Construction standards 80 years ago allowed the use of local river stones in the concrete mix, which does not meet current construction standards. This bridge is well past its replacement life and is not up to current construction and safety standards and must be replaced to prevent potential failure.

2.3 Project Description

The CDOT Region 2 Bridge Bundle Design Build Project consists of the replacement of a total of nineteen (19) structures bundled together as a single design-build project. These structures are rural bridges on essential highway corridors (U.S. Highway [US] 350, US 24, CO 239 and CO 9) in southeastern and central Colorado. These key corridors provide rural mobility, intra- and interstate commerce, movement of agricultural products and supplies, and access to tourist destinations. The design build project has two funding sources; Bridge G-12-C will be jointly funded by the USDOT FHWA Competitive Highway Bridge Program grant and the Colorado Bridge Enterprise (Project No. 23558).

Bridge G-12-C is located on CO 9 at milepost 71.44, approximately 0.8 miles north of Alma, Colorado. The bridge is a large, double culvert (two (2) cells 10 feet [ft] by 10 ft, 36-ft long) structure that crosses over the Middle Fork of the South Platte River. The existing culvert has a concrete bottom and concrete wingwalls at all four corners. The length of the existing box culvert is 23 ft.

During construction of the new structure, the existing culvert will likely be split to allow work to proceed on one side of the structure while accommodating traffic on the other side. This will avoid the need for construction of a temporary shoofly that would adversely impact to the river. The area of disturbance will be restricted to the limits of the ROW.

Once bridge construction is completed and ready for use, any disturbed areas will be restored to the original contours and reseeded.

One alternative for replacement of the existing bridge includes a bottomless double arch culvert with a width of 24 ft and a maximum height of 10 ft. Under this alternative, there would be two cells for a total width of approximately 52 ft. This alternative does require a small footing in the middle river that would be buried several feet. The final bottom of the creek would be restored to existing conditions.

The second alternative would be a precast concrete girder bridges with a single span of 60 feet and a vertical clearance of approximately 10 feet. This alternative does not require a center support, just two concrete abutments outside of the riverbanks.

The roadway approaches for both alternatives will require widening the roadway with wider shoulders. To minimize impacts the approach roadway will have retaining walls to minimize the fill slope impacts.

2.4 Directions to the Site

The PIA is accessible from Denver, Colorado, by taking CO 470 to the US 285 S exit towards Fairplay. At Fairplay, turn right onto CO 9 (Main Street) towards Alma, and continue through the Alma town center for about 0.8 miles north of town before reaching the Project bridge at the Middle Fork of the South Platte River. There is a large pull-off area on the right immediately after the bridge to access the site.

3. Methods

3.1 Regulatory Context

Section 404 of the Clean Water Act (CWA) regulates the discharge of dredged or fill material into WOTUS and is administered by the U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (EPA). The definition of WOTUS has been in flux in recent years, with the latest definition published by the EPA in the Navigable Waters Protection Rule, which went into effect on June 22, 2020, in 49 states. Due to an injunction issued by a federal court in Colorado, the Navigable Waters Protection Rule has not gone into effect in Colorado, and instead the state remains under the post-*Rapanos v. United States* (Rapanos) guidance (USACE and EPA 2008). The potential for waters of the U.S. within the PIA therefore will be evaluated per the definition in the the Rapanos guidance. Since the WOTUS definition under Rapanos is more expansive than the Navigable Waters Protection Rule, assessing the PIA under Rapanos ensures that no additional revaluation is likely to be required in the event CWA applicability changes in Colorado during the period of Project construction.

The Rapanos guidance defines waters of the U.S. as traditional navigable waters (TNWs), relatively permanent waters, and their adjacent wetlands.[1] Additionally, the Rapanos

[1] Adjacent is defined as “bordering, contiguous, or neighboring” in the Rapanos guidance.

guidance includes all tributaries with a bed and bank or ordinary highwater mark (OHWM) that have a significant nexus to a Traditionally Navigable Water, as well as wetlands, ponds, impoundments, and lakes located adjacent to said tributaries. Under Section 404 of the CWA, the OHWM defines the lateral extent of federal jurisdiction in non-tidal WOTUS (absent adjacent wetlands) (33 U.S.C. 1251). Per the regional guidance developed by the Corps (Mersel and Lichvar 2014), OHWM in Colorado is considered to be the "physical and biological signature established and maintained at the boundaries of the active channel." Mersel and Lichvar (2014) state the OHWM identification in non-perennial streams is based on three primary physical or biological indicators—topographic break in slope, change in sediment characteristics, and change in vegetation characteristics.

3.2 Wetland Delineation

The wetland delineation was conducted in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the Regional Supplement to the *Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (USACE 2010). The entire survey area was assessed by the biologists to determine the presence or absence of wetland features. Any location that contained some potential as a wetland based on surface conditions such as the presence of dominant hydrophytic vegetation or surface hydrology was investigated more closely with a sampling point containing a soil pit, a delineation field form, and photo documentation (Appendices C, D, and E).

Additionally, a Functional Assessment of Colorado Wetlands (FACWet) was conducted for the site using the CDOT wetland functional assessment method (Version 3, 2013). Information on site characteristics was collected during the field survey, and additional information was gathered from multiple online databases. The results of the site assessment and desktop analysis are presented in a FACWet form (Appendix F).

At the request of CDOT, a preliminary Wetland Findings Report has been prepared using the CDOT Programmatic template (Appendix G). Please note that the Wetland Findings Report will need impact information to be complete. All impact analysis will not be completed at this time.

Sources of information used in this investigation include:

- Web Soil Survey (USDA/NRCS 2020) – No published soil survey for area.
- Aerial photography of the PIA from the National Agriculture Imagery Program (NAIP) taken in 2017, and from aerial drone photography collected by Stanley.
- National Wetland Plant List, version 3.4 (USACE 2018)
- Munsell Soil-Color Charts (Munsell Color 2009)
- National Wetland Inventory (NWI) Map (USFWS 2020) (See Appendix B, NWI Mapping)

3.3 Non-Wetland Waters Delineation

The PIA was examined for any potential OHWM supporting features, such as root exposure, water staining, silt deposits, litter removal, etc. (Mersel and Lichvar 2014, USACE 2005), that might provide information interpreting recent flow levels (e.g., drift/wrack deposits or headcutting) or that might eliminate or reinforce potential OHWM

locations. Stanley also examined aerial photography and hydrologic data to support the Section 404 CWA assessment. The boundaries of any non-wetland water features were identified by the OHWM indicators and recorded using a Trimble sub-meter GPS antenna connected to a tablet or smart phone, and were also surveyed using the same sub-meter GPS unit.

4. Existing Conditions

4.1 Topography

The PIA is located in the bottom of the Middle Fork of the South Platte River valley, surrounded by steep mountain slopes up to tall peaks. The area includes the river channel area and its surrounding terraces and slopes. The elevation at the site is approximately 10,400±5 ft above sea level. Land use in the area is sparse residential and light commercial development along the highway, but the river floodplain is in a relatively natural state, other than some floodplain alterations around the highway crossing structure. The highway and bridge structure were constructed in approximately 1938, and to construct the bridge, the main river channel was diverted, and a new river channel was constructed so it would flow straight through the large, double culvert that was installed. This has resulted in the original channel on the western side of the highway becoming an oxbow/overflow open water area. The original channel under the present roadway grade was buried and the main flows put into the newly constructed channel. Once the channel clears the east side of the bridge, it returns to its approximate original channel.

4.2 Climate

The PIA has an average maximum temperature of 43° F and average minimum temperature of 18.1° F. The average annual precipitation is 22.8 inches (Weather-US 2020). Normal monthly precipitation average for August is 2.1 inches but during this past August (when the field survey was conducted), the rainfall was measured at 0.83 in., which is below normal (Weather Underground 2020).

4.3 NWI Mapping

National Wetlands Inventory (NWI) data suggested that wetlands could exist within the PIA, classified as riverine, freshwater pond, and freshwater forested/shrub (See Appendix B, Supporting Maps, NWI Mapping).

4.4 Plant Communities

The plant communities in the PIA consisted of riparian scrub-shrub and disturbed roadway edges. The riparian scrub-shrub included various willow species including yellow willow (*Salix lutea*) and wolf willow (*Salix woflii*), as well as Pennsylvania cinquefoil (*Potentilla pensylvanica*) in the shrub stratum, with an understory of Baltic rush (*Juncus balticus*) and leafy tussock sedge (*Carex aquatilis*). The upland areas along the edge of the roadway included a mix of some of the willows extending into these areas but with an understory

of species such as smooth brome (*Bromus inermis*), dandelion (*Taraxacum* sp.), yarrow (*Achillea millefolium*), with woodland strawberry (*Fragaria vesca*) and Baltic rush closer to the edges with the willow. See Appendix C for the full plant list of species recorded.

4.5 Hydrology

The dominant hydrological feature in the area is the Middle Fork of the South Platte River, where all surface and sub-surface drainage flows into. From Alma, the Middle Fork flows southeast until its confluence with the South Platte River, approximately 3 miles east of Hartsel, Colorado. From this point the South Platte River flows southeast, then turns northeast towards Denver, then east where it joins the North Platte River. From this location it continues east to the Missouri River and south to the Gulf of Mexico.

In the PIA, groundwater levels above the OHWM were generally low as August is one of the drier months and this August is below normal. In wetland areas, saturation above 12 inches was present but the water table was not within 12 inches. The surrounding uplands soils were also very dry with no signs of hydrology within 18 inches. The primary hydrology input is the river with other inputs that include groundwater and surface runoff from the adjacent hillsides and the highway.

4.6 Soils

The soils map for this area has not been published, if mapped at all, for this location by the NRCS. Regardless, the soils observed in both the wetland and upland sample points are likely all typical alluvial floodplain soils consisting of deposits of sands and gravels, with some accumulation of organics in areas above the current OHWM. The sample point soils displayed these characteristics, consisting of sandy loams in the surface layer, with loamy sands and sands with gravels in the lower layers. Colors were generally dark grayish brown in the wetlands, but brown in the uplands. Some locations, especially the upland soils, are likely influenced by the existing roadway fill, either when it was deposited to build the road or later through sedimentation run-off.

5. Aquatic Resource Results

Field data forms reflect the conditions as observed at the time of investigation and can be found in Appendix D. Associated photos of the sample points can be found in Appendix E. Sample points were chosen to best represent the features observed and are listed in Table 1 (Sample Point Summary Data). The following subsections summarize the results of the delineation including a description of any wetlands delineated, justification for the boundaries, classification of the wetlands, functionality of the wetlands, and any waters identified. Feature details are summarized in Table 2 (Aquatic Resources within PIA).

Table 1. Sample Point Summary Data

Sample Point ID	Hydrophytic Vegetation?	Hydric Soils?	Wetland Hydrology?	Sampled Area within a Wetland?
SP1	Y	Y	Y	**Y**
SP2	N	N	N	N
SP3	Y	Y	Y	**Y**
SP4	Y	N	N	N
SP5	Y	Y	Y	**Y**
SP6	Y	N	Y	N

Table 2. Aquatic Resources within PIA

Aquatic Resource Name	Cowardin[2]	Location (Lat/Long)	Area (ac)	Length (ft)
Wetlands				
Wetland 1	PSS1A	39.294928/-106.065426	0.02	
Wetland 2	PSS1E	39.294971/-106.065699	0.06	
Wetland 3	PSS1B	39.294546/-106.065813	0.04	
Non-wetland Waters				
Middle Fork of the South Platte River	R3UB1H	39.294843/-106.065477	0.14	243
Drainage 1	R5UB3H	39.294499/-106.065822	0.02	171
		Totals	**0.28**	**414**

5.1 Wetland 1

Wetland 1 is a palustrine shrub-scrub wetland (0.02 ac) located on the northeastern side of the G-12-C bridge. Part of the wetland starts below the OHWM with most extending into the riparian bank and terrace between the roadway fill toe of slope and the adjacent hillside toe of slope (See Wetland 1, Appendix E: Photo Inventory). Vegetation is characterized as shrub-scrub riparian dominated by three species of willow (OBL) and with an herbaceous stratum of Baltic rush (FACW) and leafy tussock sedge (OBL) dominants. The soils observed in the soil pit (SP1) consisted of dark gray and dark grayish-brown sandy soils with redox coated sand grains starting as shallow as 2 inches and continuing to beyond 18 inches. The main layer (2-10 inches) satisfied the Sandy Redox (S5) hydric soil indicator. Wetland hydrology was present at this dry time of the year primarily as saturation starting at 10 inches, though other secondary indicators, such as drainage patterns and geomorphic position, were also observed.

This wetland is likely influenced not only by the abutting stream, the Middle Fork of the South Platte River, but also by surface run-off and possibly groundwater from the adjacent steep hillside. The east and west borders were delineated by where the soils became non-hydric as the slopes increased. The north border was a bit more gradual as the slope on that end was less steep, and some extra test pit digging was needed to verify the boundary. The south border was indicated by where the vegetation stopped and scour from the active channel became too great for the vegetation to persist there.

[2] Cowardin wetland classification system. Cowardin, L. M.; Carter, V.; Golet, F. C.; LaRoe, E. T. "Classification of wetlands and deepwater habitats of the United States". U.S. Department of the Interior, Fish and Wildlife Service.

5.2 Wetland 2

Wetland 2 is a palustrine shrub-scrub wetland (0.06 ac) located along the edge of the open water associated with the Middle Fork of the South Platte River, as a wetland fringe at or below the OHWM. This wetland fringe is the vegetated zone of the OHWM at the toe of slope along the roadway, but also extends around the old back channel feature (outside of surveyed area and CDOT ROW) (See Wetland 2, Appendix E: Photo Inventory). Vegetation is characterized as shrub-scrub riparian dominated by yellow willow (OBL), with an herbaceous stratum dominated by dagger-leaf rush (FACW) and leafy tussock sedge (OBL). The soils observed in the soil pit (SP3) consisted of very dark (black) sandy loam soils with redox concentrations starting at 5.5 inches from the surface and continued beyond 12 inches. This soil satisfied the hydric soil characteristics of Redox Dark Surface (F6). Wetland hydrology was present at this dry time of the year primarily as saturation within 5 inches and a high-water table at 12 inches, though other secondary indicators were also observed. Some surface water was present close by in the adjacent river back channel area.

This wetland is supported by the water of the river and its large back channel area, which apparently used to be the main channel before the highway bridge was built and the river channel was moved to accommodate the structure. This wetland fringe can be observed along the edge of the open water portions of the historic channel or back channel area, and also the main channel, though the plant species may vary some depending on the location. On this portion of the wetland fringe, the upland areas are immediately adjacent and to the east and are a part of the highway road fill slope which also contains some of the same deep-rooted willows.

5.3 Wetland 3

Wetland 3 is a palustrine shrub-scrub wetland (0.04 ac) located on the uphill and west side of a small drainage (see Drainage 1) (See Wetland 3, Appendix E: Photo Inventory). Vegetation is characterized as shrub-scrub riparian dominated by yellow willow (OBL), resin birch (OBL), and shrubby cinquefoil (FAC), with an herbaceous stratum dominated by Baltic rush (FACW) and club spike-moss (FACW). The soils observed in the soil pit (SP5) consisted of dark grayish brown to black sandy clay loams and sandy loam with redox concentrations starting within an inch of the surface and continuing to at least 16 inches. Redox includes both iron and manganese masses in the matrix and pore linings. This soil satisfied the hydric soil characteristics of Redox Dark Surface (F6). Wetland hydrology was present at this dry time of the year primarily as saturation to the surface, with secondary indicators also observed.

This wetland appears to be supported by various seeps from the adjacent hillside, though run-off drainage from the adjacent highway could also be a part of it. The drainage channel (see Drainage 1) appears to drain these groundwater seeps downslope to the river, so wetlands did not appear to be present east of the drainage, only on the west side. The closest upland area within the PIA is the roadway fill shoulder.

5.4 Middle Fork of the South Platte River

The Middle Fork of the South Platte River is the primary, perennial riverine system in the area (243 linear ft, 0.14 acres), receiving all local drainages and flowing from the north to the south. The OHWM was determined by recording evidence of scour and debris

wracking (See Middle Fork of the South Platte River, Appendix E: Photo Inventory). The scour was mostly in the most active part of the floodplain, the low water channel. The next higher level of the OHWM was where less frequent scour occurs mostly during yearly spring flood events, but enough to form a second, higher bank. This area is were the wrack was observed being deposited, likely during yearly spring or early summer snow melt run-off. The linear foot length includes the area of open water of the historic channel, which now behaves more like an oxbow or overflow channel.

5.5 Drainage 1

Drainage 1 is a small, apparently perennial drainage (171 linear ft, 0.02 acres) that drains hillside seeps and roadside run-off into the Middle Fork of the South Platte River. The drainage runs along the southwest side of the PIA, receiving input from seeps at the toe of slope (see Wetland 3) and possibly from a swale outside and to the west of the PIA (See Drainage 1, Appendix E: Photo Inventory). Upslope from the start of Drainage 1 is a roadside swale feature that appears to drain into this drainage from the south, starting roughly from the intersection of River Drive and CO 9. This roadside swale was vegetated and lacked any OHWM indicators but likely drains into Drainage 1 during large stormwater events.

Drainage 1 is partially obscured with dense, willow vegetation including yellow willow (OBL) and wolf willow (OBL). At the beginning of the channel, the swale merging in from the south contains sedges such as leafy tussock sedge (OBL), but some mowing has occurred and has obscured some species. The channel width is variable but generally about 3-4 ft wide, without vegetation in the channel, mild scour, and a bed and bank with a muddy bottom. This drainage appears to contain steady, yearly flows but rarely if ever strong, scouring flows.

6. Interstate Commerce

Federal authority to regulate waters within the United States is primarily derived from the Commerce Clause, which gives Congress the power to regulate interstate commerce. Section 404 of the Clean Water Act defines the limits of jurisdiction as encompassing navigable waters and waters of the U.S. including, among other water bodies, “waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce” (40 CFR § 120.2(1)(i)).

The section of the stream intersecting the PIA is currently primarily used for recreational purposes and does not appear to support interstate commerce. However, the replacement of the existing bridge with an updated structure to meet CDOT standards will not affect water flows or alter the ability of the stream to support any future interstate commerce.

7. Summary

Three scrub-shrub wetlands (0.12 acres total) and one drainage (0.02 acres and 171 linear ft) were identified and delineated within the Potential Impact Area that are all connected to the Middle Fork of the South Platte River (0.14 acres and 243 linear ft).

7.1 Anticipated Impacts

In the event that the selected Project design will impact any potential waters of the U.S. delineated in this report, the impacts to these resources would need to be approved or permitted by the USACE. Depending on the level of impacts, the Project would likely require permitting under the Nationwide Permit (NWP) program or through an Individual Permit. The NWP program is available for projects with relatively minor impacts (the exact nature of the impacts and acreage thresholds depend on the applicable NWP), while Individual Permits are required for projects with larger impacts and can involve a lengthy permitting process.

Permitting impacts to wetlands would likely require the submittal of a pre-construction notification to the Corps, as the project wetlands identified within the PIA are located approximately 0.22 miles downstream of a potential fen (OTIS 2020). Per the Colorado Regional Conditions, "[a]ll nationwide permits, with the exception of 3, 5, 6, 20, 27, 32, 37, and 38, are revoked for activities located in fens and wetlands adjacent to fens" (USACE 2017). Although the project team did not identify any fens within the PIA, based on aerials, the PIA wetlands' proximity to the river, and the National Wetland Inventory mapping, there is potential for the delineated wetlands to be considered part of the fen complex. As such, in order to be permitted under an applicable NWP and prior to commencing any Project activities, the applicant will be required to submit a Pre-Construction Notification to the USACE successfully demonstrating any adverse environmental effects to the fen hydrology are minimal in order to qualify for NWP coverage.

CDOT requires the submittal of a Wetland Findings Report. Once Project impacts have been determined, the Contractor will be required to 1) determine whether the impacts meet the CDOT Programmatic or Non-Programmatic report template requirement criteria, 2) complete the existing Wetland Findings Report; and 3) submit the Wetland Findings Report to CDOT for approval. At the request of CDOT, a Programmatic Wetland Findings Report has been started with the available information and is provided in Appendix F.

7.2 Avoidance and Mitigation Measures

Measures to avoid, minimize, or mitigate for potential impacts to wetlands and other WOTUS include:

- Tailoring design to avoid or minimize impacts as much as possible given structural constraints.

- Having construction methods and equipment that can avoid or minimize temporary impacts by reducing footprint of machines used or accessing work from roadway fill or other uplands.

- Developing compensatory mitigation measures, if permanent impacts are not avoidable. These measures would be a part of the permitting process with the USACE.

- Developing a detailed and thorough construction plan which includes best management practices. An example is a Stormwater Pollution Prevention Plan, that incorporates measures to protect sensitive resources from stormwater run-off, pollutants, etc. due to construction activities.

8. References

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Office of Biological Services, U.S. Department of the Interior, FWS/OBS-79/31.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experimental Station, Vicksburg, MS.

Mersel, Matthew K. and Robert W. Lichvar. 2014. "A Guide to Ordinary High Water Mark (OHWM) Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States." ERDC/CRREL TR-13-14. Hanover, NH: U.S. Army Engineer Research and Development Center, Wetlands Regulatory Assistance Program.Munsell Color. 2009. Munsell Soil-Color Charts. Grand Rapids, MI.

OTIS. 2020. CDOT Online Transportation Information System [Online database map]. Accessed November 3, 2020. https://dtdapps.coloradodot.info/MapViewext/

U.S. Army Corps of Engineers (USACE). 2005. Regulatory Guidance Letter: Ordinary High Water Mark Identification. RGL-05-05. December 7, 2005.

_____. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*, ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

_____. 2017 Regional Conditions to Nationwide Permits in the State of Colorado. U.S. Army Corps of Engineers, Albuquerque District, Omaha District, and Sacramento District. January 11, 2017.

_____. 2018. National Wetland Plant List, version 3.4. http://wetland_plants.usace.army.mil/. U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH.

U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (EPA). 2008. Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States. December 02, 2008.

U. S. Fish and Wildlife Service (USFWS). 2020. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. http://www.fws.gov/wetlands/. Accessed September 21, 2020.

Weather Underground. 2020. Monthly History for August 2020. https://www.wunderground.com/calendar/us/co/aspen/KASE/date/2020-8. Accessed September 21, 2020.

Weather-US.com. 2020. Monthly Weather Forecast and Climate, Alma, CO. https://www.weather-us.com/en/colorado-usa/alma-climate#temperature. Accessed September 21, 2020.

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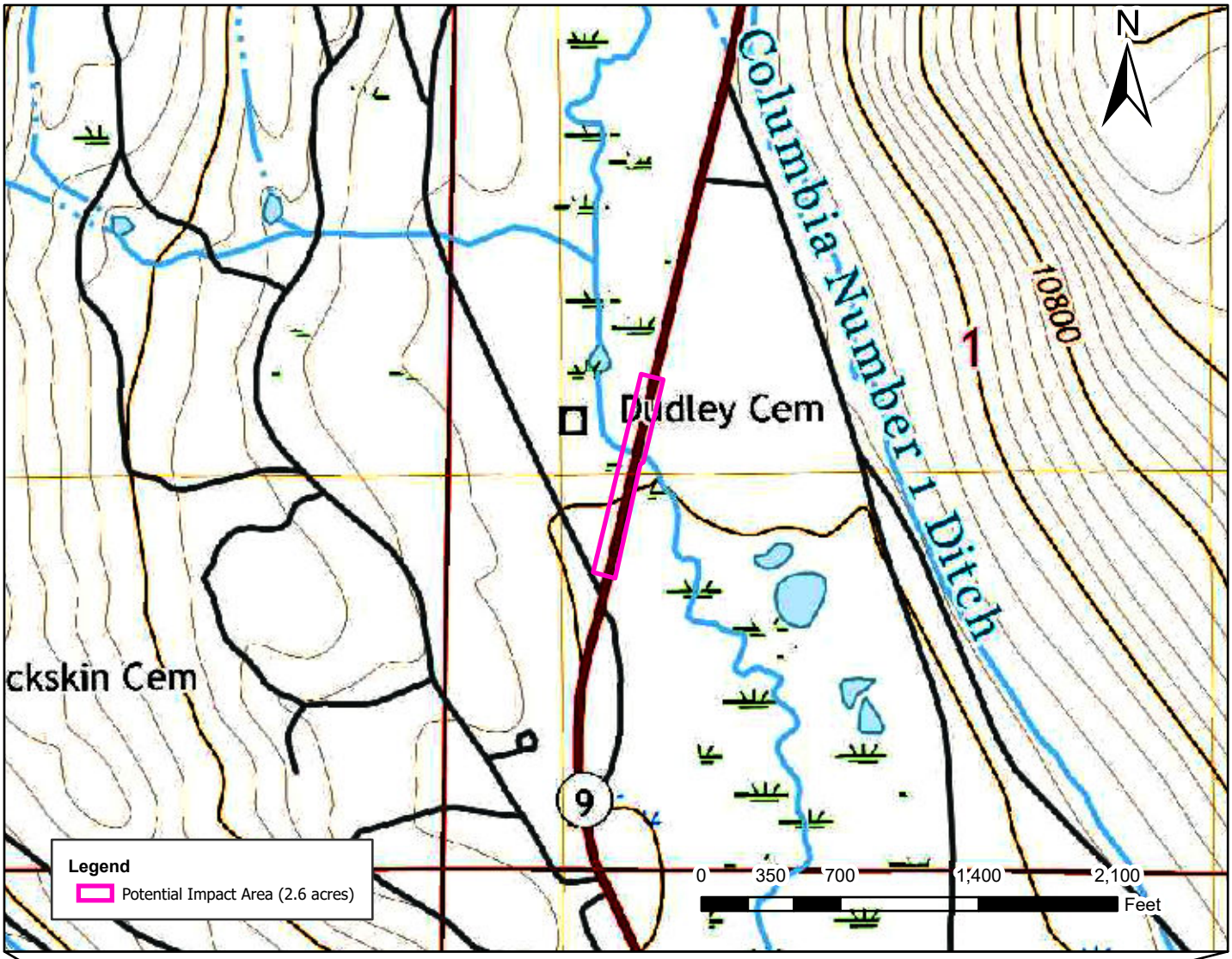
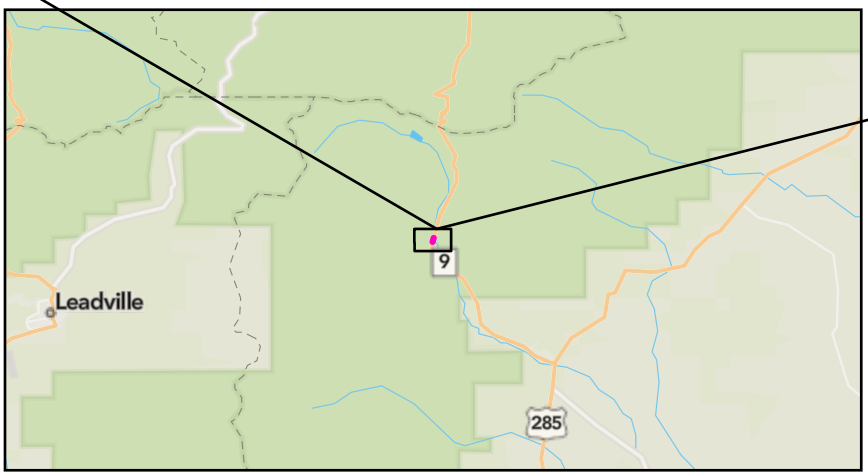
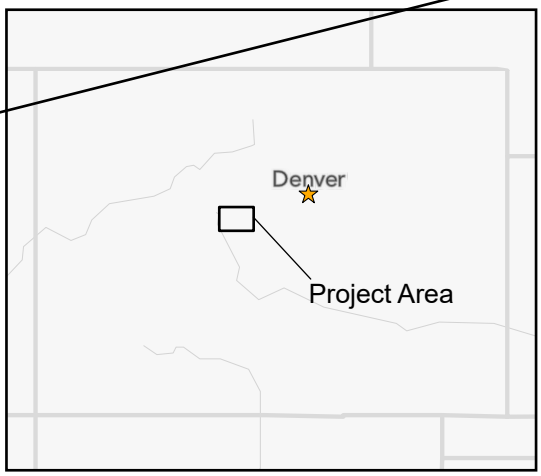
Appendix A

Aquatic Resources Delineation Maps







Colorado Department of Transportation
R2 Bridges - G-12-C

Figure 1
Vicinity Map

Image Source: ArcGIS Online, World Street Map, World Topographic Map
USGS Topo: Alma, CO
S1, T9S, R78W
Bridge Lat/Long: 39.294857/-106.065597

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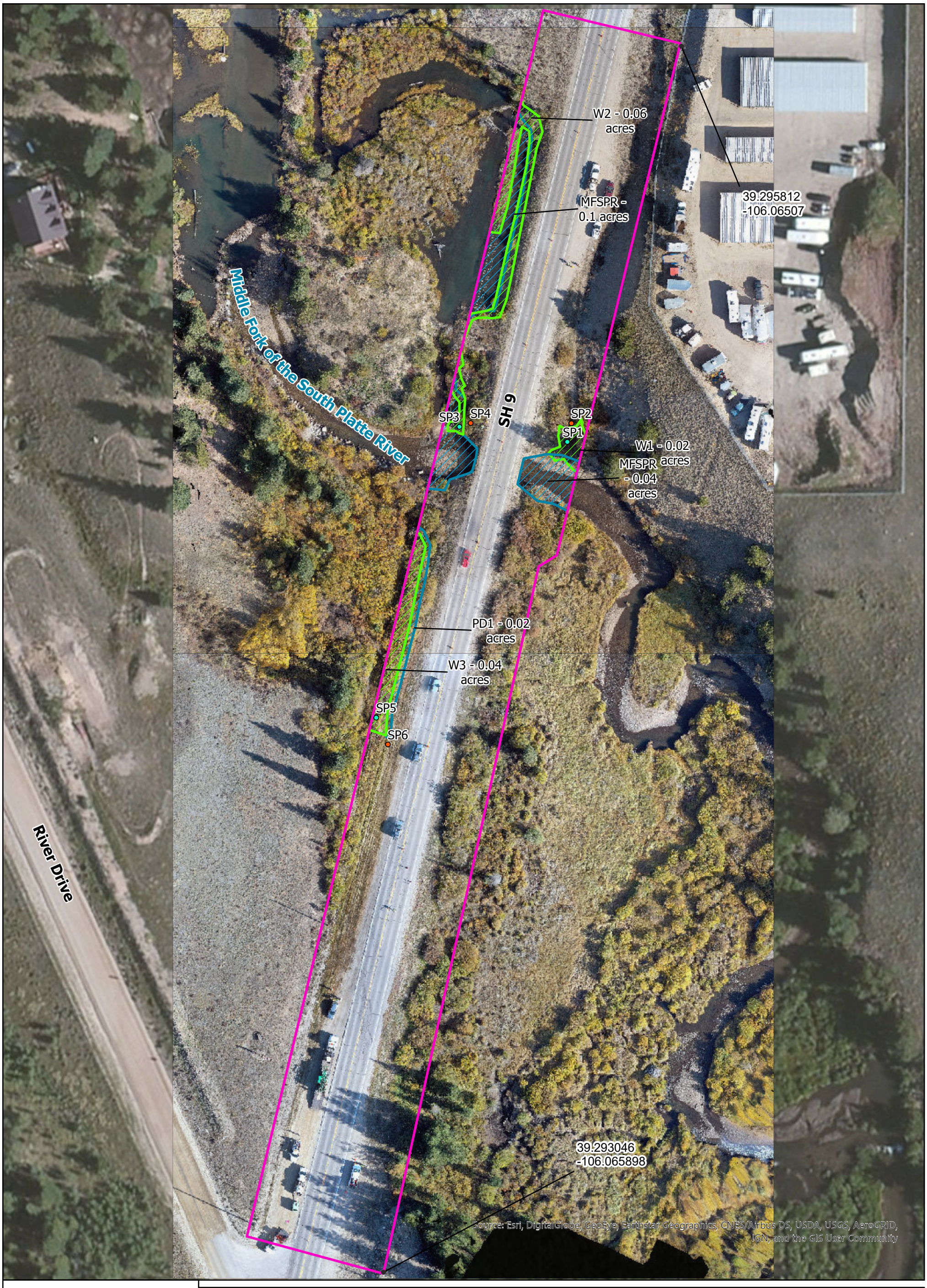
Date Exported: 7/24/2020 10:04 AM

Path: C:\Users\9666\Documents\A_WorkDocs\GIS_files\CDOT\19_Bridges\19-GIS\03-MXDs\CDOT_G-12-C.aprx



Legend

- Potential Impact Area (2.6 acres)
- Upland Sample Point
- Wetland Sample Point
- Wetland (0.12 acres)
- Perennial Stream (0.16 acres)

Colorado Department of Transportation
R2 Bridges Project - G-12-C

Figure 2: Potential Impact Area

N

Coordinate System: NAD 1983
State Plane CO Central FIPS 0502 (US feet)
Projection: State Plane
Datum: North American 1983
Created: October 9, 2020
1 inch = 71.67 feet on 11 x 17

0 20 40 80 120 Feet

Stanley Consultants INC.

Data Source: Stanley Consultants, Inc.
Image Source: ArcGIS, World Imagery (Clarity);
Detailed Imagery from Stanley drone

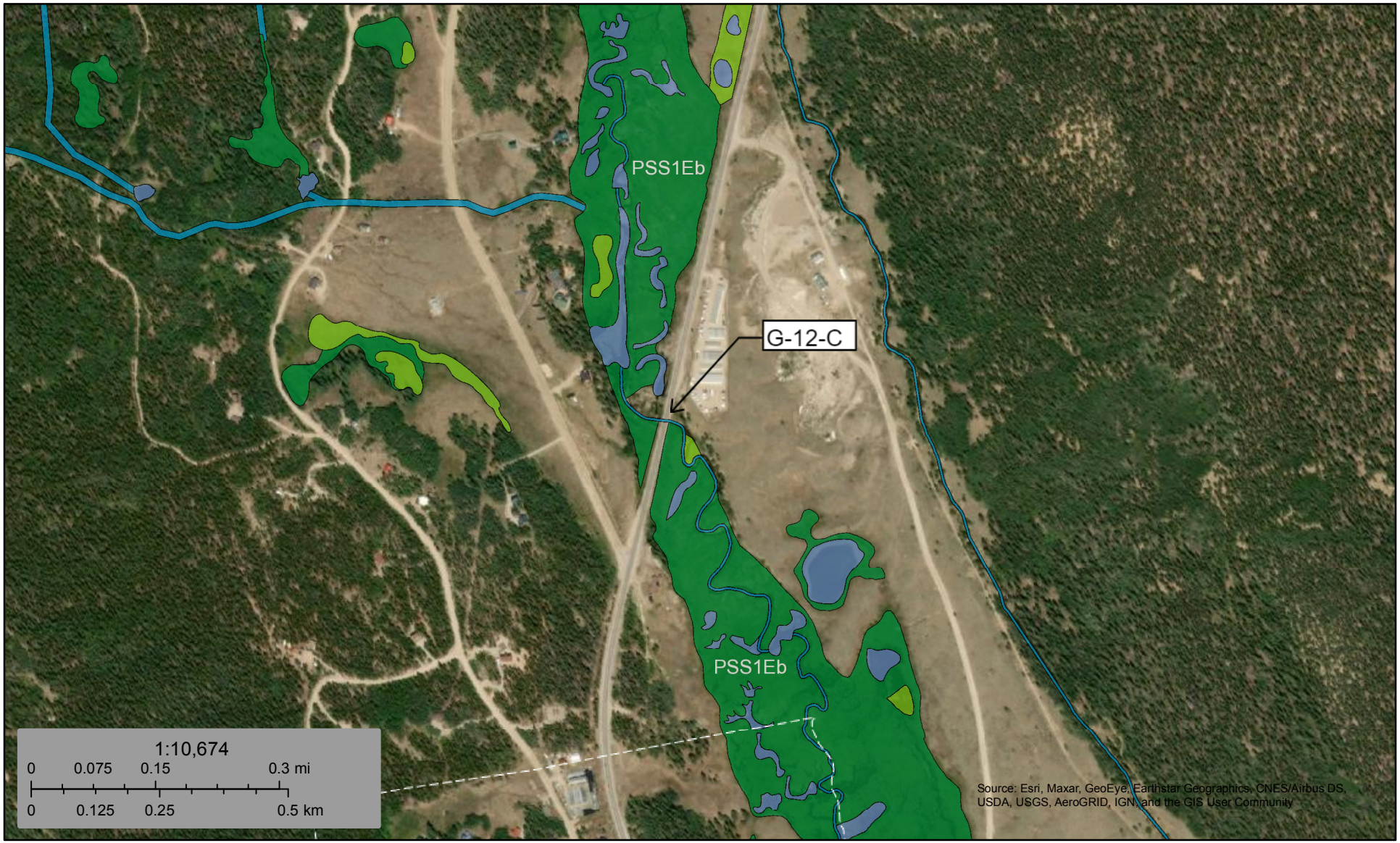
Date Exported: 10/9/2020 1:14 PM

Appendix B

Supporting Maps and Documents

U.S. Fish and Wildlife Service
National Wetlands Inventory

G-12-C NWI Map



September 21, 2020

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

No soils have been mapped within the Potential Impact Area by the Natural Resources Conservation Service

Appendix C

Plant List

Common Name	Scientific Name	Wetland Indicator Status*
Baltic rush	*Juncus balticus*	FACW
Blue wild rye	*Elymus glaucus*	FACU
Canada thistle	*Cirsium arvense*	FAC
Common dandelion	*Taraxacum officinale*	FACU
Common yarrow	*Achillea millefolium*	FACU
Dagger-leaf rush	*Juncus ensifolia*	FACW
Fowl manna grass	*Glyceria striata*	OBL
Golden-hardhack	*Dasiphora fruticosa*	FAC
Leafy tussock sedge	*Carex aquatilis*	OBL
Limber pine	*Pinus flexilis*	UPL
Narrow-leaf willow	*Salix exigua*	FACW
Northern spike-moss	*Selaginella selaginoides*	FACW
Resin birch	*Betula glandulosa*	OBL
Smooth brome	*Bromus inermis*	UPL
Strawberry-head clover	*Trifolium fragiferum*	FACU
Streamside fleabane	*Erigeron glabellus*	FAC
Wolf willow	*Salix wolfii*	OBL
Woodland strawberry	*Fragaria vesca*	FACU
Yellow toadflax	*Linaria vulgaris*	UPL
Yellow willow	*Salix lutea*	OBL

Appendix D

Wetland Delineation Data Sheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: R2 Bridges/G-12-C City/County: Alma/Park Sampling Date: 8/28/2020

Applicant/Owner: Colorado Department of Transportation State: CO Sampling Point: SP1

Investigator(s): T. Toler, R. Black Section, Township, Range: S 1, T 9S, R 78W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 2

Subregion (LRR): E Lat: 39.294923 Long: -106.065408 Datum: WGS84

Soil Map Unit Name: (no NRCS soil data, possible data with USFS-Pike&SanIsabel NF) NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Riparian scrub/shrub (willow) wetland bank next to Middle Fork of the South Platte River. Sandy redox soils with saturation above 12 inches.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 3m)			
1. Salix lutea	45	Y	OBL
2. Salix exigua	10		FACW
3. Salix wolfii	5		OBL
4. Dasiphora fruticosa	2		FAC
5.			
	67 = Total Cover		
Herb Stratum (Plot size: 1m)			
1. Juncus balticus	40	Y	FACW
2. Carex aquatilis	20	Y	OBL
3. Cirsium arvense	5		FAC
4. Dasiphora fruticosa	2		FAC
5. Achillea millefolium	1		FACU
6.			
7.			
8.			
9.			
10.			
11.			
	68 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Mixed willow riparian wetland with Juncus and Carex understory, and other mesic (but not wetland) riparian species.

SOIL

Sampling Point: SP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/2	100					SaLo	rootmat
2-10	10YR 4/1	75	5YR 4/6	25	CS	M	LoSa	
10-18	10YR 4/2	80	7.5YR 4/4	20	CS	M	Sa	with gravels

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ✓ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Medium-light sandy soils with redox in the sandy layers coating the sand grains, starting below 2 inches. Some gravels below 10 inches. Satisfies Sandy Redox (S5) hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 10

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Dry season, water table and creek are low, but saturation was present starting at 10 inches. Three secondary indicators also present.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: R2 Bridges/G-12-C City/County: Alma/Park Sampling Date: 8/28/2020

Applicant/Owner: Colorado Department of Transportation State: CO Sampling Point: SP2

Investigator(s): T. Toler, R. Black Section, Township, Range: S 1, T 9S, R 78W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 2

Subregion (LRR): E Lat: 39.295010 Long: -106.065382 Datum: WGS84

Soil Map Unit Name: (no NRCS soil data, possible data with USFS-Pike&SanIsabel NF) NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Riparian upland bank close to wetland edge, by the Middle Fork of the South Platte River. Mixed plant community, no wetland hydrology, and soils fail to indicate wetland conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 3m)			
1. Salix lutea	10	Y	OBL
2. Dasiphora fruticosa	10	Y	FAC
3.			
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: 1m)			
1. Juncus balticus	20	Y	FACW
2. Bromus inermis	10	Y	UPL
3. Achillea millefolium	10	Y	FACU
4. Fragaria vesca	10	Y	FACU
5. Taraxacum officinale	5		FACU
6.			
7.			
8.			
9.			
10.			
11.			
	55 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	20	x 2 =	40
FAC species	10	x 3 =	30
FACU species	25	x 4 =	100
UPL species	10	x 5 =	50
Column Totals:	75 (A)		230 (B)

Prevalence Index = B/A = 3.06

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Mixed mesic (but not wetland) riparian species with wetland willow and Juncus as also dominants closer to the wetland edge.

SOIL

Sampling Point: SP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					SaLo	
6-10	10YR 4/3	100					LoSa	with rocks and gravels
10-11	10YR 4/3	95	7.5YR 4/4	5	C	M	LoSa	
11-18	10YR 4/3	100					LoSa	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Mostly loamy sandy soils, dark upper 6 inches, but below 4/3 soils with only a one-inch layer of non-distinct redox concentrations. Redox layer too narrow and too deep for sandy soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Dry, sandy soils.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: G-12-C City/County: Park Sampling Date: 21-Sep-2020

Applicant/Owner: CDOT State: CO Sampling Point: SP3

Investigator(s): C. Phillips Section, Township, Range: T9S, R78W, Sec 01

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 5

Subregion (LRR): LRR E (Rocky Mountain Forests and Rangeland) Lat: 39.294961 Long: -106.065694 Datum: WGS84

Soil Map Unit Name: No Data Available NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Wetland fringe shrub-scrub bank next to river and river back channel area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 10')			
1. Salix lutea	25	Y	OBL
2. Salix wolfii	5	N	OBL
3. Dasiphora fruticosa	1	N	FAC
4. Pinus flexilis	2	N	UPL
5.			
	33 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Juncus ensifolia	60	Y	FACW
2. Carex aquatilis	10	N	OBL
3. Selaginella selaginoides	6	N	FACW
4. Erigeron glabellus	4	N	FAC
5. Elymus glaucus	1	N	FACU
6. Fragaria vesca	1	N	FACU
7.			
8.			
9.			
10.			
11.			
	82 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Sampling conducted after a recent freeze that has affected the ability to determine some species.

SOIL

Sampling Point: SP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-1	10YR 2/1	100					O Horizon	
1-5.5	10YR 2/1	100					Sandy loam	Very gravelly - roadside fill?
5.5-12	10YR 2/1	90	10YR 5/6	2	C	M	Sandy loam	
			Gley1 2/1	2	C	M		
			10YR 5/4	5	C	M		
			7.5YR 4/4	1	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Matrix filled with gravel and cobbles, either from road fill or drainage deposition.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): 12

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 5

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Point located on bench above adjacent stream, with standing water close by.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: G-12-C City/County: Park Sampling Date: 21-Sep-2020

Applicant/Owner: CDOT State: CO Sampling Point: SP4

Investigator(s): C. Phillips Section, Township, Range: T9S, R78W, Sec 01

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 25

Subregion (LRR): LRR E (Rocky Mountain Forests and Rangeland) Lat: 39.294978 Long: -106.065669 Datum: WGS84

Soil Map Unit Name: No Data Available NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Upland slope above fringe wetlands and river channel area. Deep-rooted willows still dominate but herbaceous layer non-wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus flexilis	3	Y	UPL
2.			
3.			
4.			
	3 = Total Cover		
Sapling/Shrub Stratum (Plot size: 10')			
1. Salix wolfii	40	Y	OBL
2. Dasiphora fruticosa	10	Y	FAC
3. Pinus flexilis	2	N	UPL
4.			
5.			
	52 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Elymus glaucus	35	Y	FACU
2. Juncus balticus	6	N	FACW
3. Linaria vulgaris	3	N	UPL
4. Fragaria vesca	1	N	FACU
5. Taraxacum officinale	1	N	FACU
6. Cirsium arvense	1	N	FAC
7.			
8.			
9.			
10.			
11.			
	47 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	6	x 2 =	12
FAC species	11	x 3 =	33
FACU species	37	x 4 =	148
UPL species	8	x 5 =	40
Column Totals:	102 (A)		273 (B)

Prevalence Index = B/A = 2.6

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Sampling conducted after a recent freeze that has affected the ability to determine some species. Data point close to wetland so deep rooted species such as willows remain.
Some roadside disturbance to soil.

SOIL

Sampling Point: SP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-15	10YR 3/1	95					Sandy loam	
0-15	10YR 3/3	5					Sand	Sand pockets interspersed within matrix

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Gravel, sand, and cobbles mixed throughout soil, likely road fill.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Dry, sandy soils.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: G-12-C City/County: Park Sampling Date: 21-Sep-2020

Applicant/Owner: CDOT State: CO Sampling Point: SP5

Investigator(s): C. Phillips Section, Township, Range: T9S, R78W, Sec 01

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 2

Subregion (LRR): LRR E (Rocky Mountain Forests and Rangeland) Lat: 39.294306 Long: -106.065939 Datum: WGS84

Soil Map Unit Name: No Data Available NWI classification: PSS1Eb

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

Small, mossy wetland that is fully saturated to the surface, possibly from seeps from adjacent hillside and/or roadside drainage. Wetland type: PEM1B.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 10')			
1. Salix lutea	15	Y	OBL
2. Betula glandulosa	5	Y	OBL
3. Dasiphora fruticosa	5	Y	FAC
4.			
5.			
	25 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Juncus balticus	80	Y	FACW
2. Selaginella selaginoides	50	Y	FACW
3. Carex aquitalis	5	N	OBL
4. Fragaria vesca	2	N	FACU
5. Glyceria striata	1	N	OBL
6.			
7.			
8.			
9.			
10.			
11.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

Sampling conducted after a recent freeze that has affected the ability to determine some species.

SOIL

Sampling Point: SP5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-0.5	10YR 2/1	100					O Horizon	High organic material
0.5-5	10YR 3/2	50	5YR 4/6	5	C	M	Sandy clay loam	
			Gley 2.5/N	45	C	M		
5-9	Gley1 2.5/N	97	5YR 4/6	3	C	PL	Sandy clay loam	
9-13	Gley1 3/10Y	95	5YR 4/6	5	C	PL	Sandy loam	Lots of gravel
13-16	Gley1 2.5/N	50	10YR 4/6	10	C	M	Sandy clay loam	
	10YR 4/2	40						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Many small to medium cobbles throughout all layers. Potentially from road fill or old channel deposits.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): At surface level

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Point located between two drainages, and may receive inputs from seeps by the adjacent hillside.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: G-12-C City/County: Park Sampling Date: 21-Sep-2020

Applicant/Owner: CDOT State: CO Sampling Point: SP6

Investigator(s): C. Phillips Section, Township, Range: T9S, R78W, Sec 01

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): LRR E (Rocky Mountain Forests and Rangeland) Lat: 39.294250 Long: -106.065896 Datum: WGS84

Soil Map Unit Name: No Data Available NWI classification: PSS1Eb

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Roadside swale that likely carries stormwater runoff from roadway but not frequent enough to either maintain an OHWM or support hydric soils.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Elymus glaucus	40	Y	FACU
2. Juncus balticus	40	Y	FACW
3. Carex aquitalis	5	N	OBL
4. Taraxacum officinale	5	N	FACU
5. Glyceria striata	2	N	OBL
6. Trifolium fragiferum	1	N	FACU
7. Fragaria vesca	1	N	FACU
8.			
9.			
10.			
11.			
	94 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 7	x 1 = 7
FACW species 40	x 2 = 80
FAC species _____	x 3 = _____
FACU species 47	x 4 = 188
UPL species _____	x 5 = _____
Column Totals: 94 (A)	275 (B)

Prevalence Index = B/A = 2.92

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Sampling conducted after a recent freeze that has affected the ability to determine some species.
Roadside has been mowed, making it difficult to accurately assess percent cover.
The Prevalence Index suggests a hydrophytic community, but fails Dominance test. If undisturbed conditions were present, site could fail.

SOIL

Sampling Point: SP6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/2	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: gravel and rock

Depth (inches): 12

Hydric Soil Present? Yes _____ No ✓

Remarks:

Soil filled with gravel and cobbles, likely roadside fill. Soil became too compacted below 12 inches to dig.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Point immediately adjacent to drainage with surface water present, possibly from recent rains and may not be indicative of typical conditions. Only secondary indicators for wetland hydrology; the feature is a roadside swale.

Appendix E

Photo Inventory

Feature: Wetland 1
Date: 9/21/2020
FACWet Score: 0.81
Photo Location: Within wetland boundary
Description: Wetland is a palustrine shrub-scrub wetland (0.02 ac) located on the northeastern side of the G-12-C bridge.

Feature: Wetland 1
Date: 9/21/2020
FACWet Score: 0.81
Photo Location: Upland point, facing southwest
Description: Wetland is a palustrine shrub-scrub wetland (0.02 ac) located on the northeastern side of the G-12-C bridge.

Feature: Wetland 2
Date: 8/29/2020
FACWet Score: 0.81
Photo Location: Inside wetland, facing south
Description: Wetland is a palustrine shrub-scrub wetland (0.06 ac) located along the edge of the Middle Fork of the South Platte River, as a wetland fringe at or below the OHWM.

Feature: Wetland 2
Date: 8/29/2020
FACWet Score: 0.81
Photo Location: Upland point, facing south
Description: Wetland is a palustrine shrub-scrub wetland (0.06 ac) located along the edge of the Middle Fork of the South Platte River, as a wetland fringe at or below the OHWM.

Feature: Wetland 3
Date: 9/21/2020
FACWet Score: 0.81
Photo Location: Within wetland, facing north
Description: Wetland is a palustrine shrub-scrub wetland (0.04 ac) located on the uphill and west side of Drainage 1.

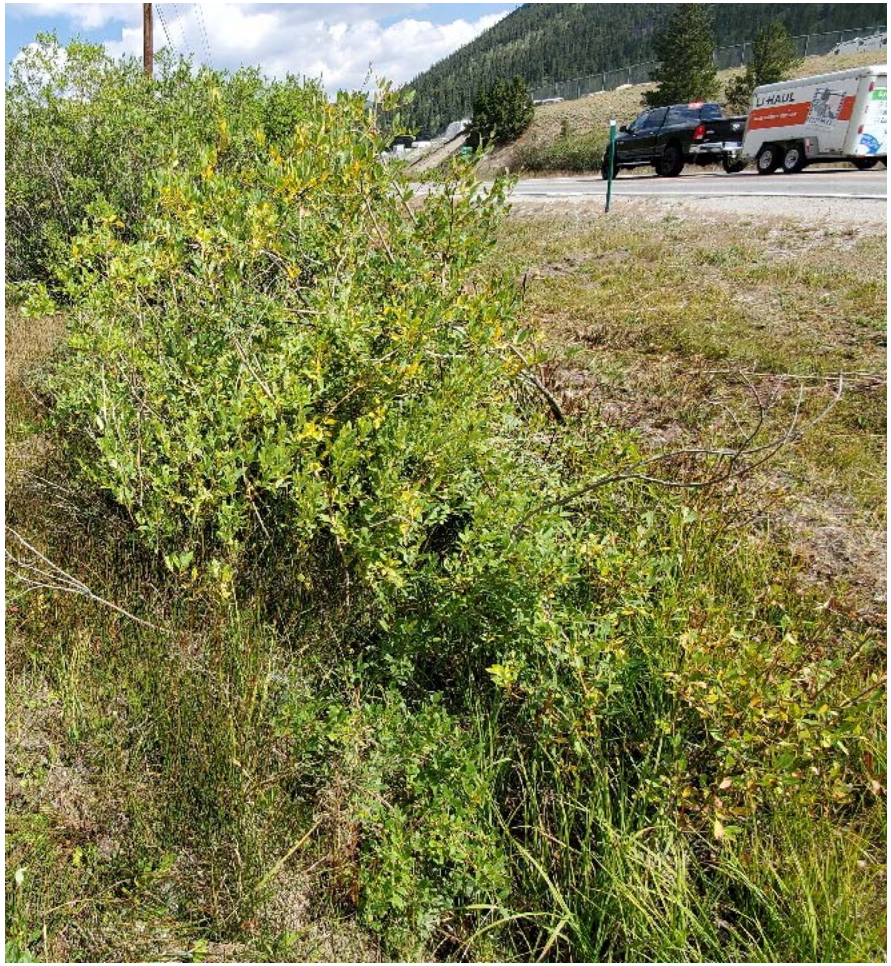
Feature: Wetland 3
Date: 9/21/2020
FACWet Score: 0.81
Photo Location: Upland point, facing south
Description: Wetland is a palustrine shrub-scrub wetland (0.04 ac) located on the uphill and west side of Drainage 1.

Feature: Middle Fork of the South Platte River
Date: 8/29/2020
Photo Location: Southeast bank, facing upstream (west)
Description: Tributary is the primary, perennial riverine system in the area (243 linear feet, 0.14 acres).

Feature: Middle Fork of the South Platte River
Date: 8/29/2020
Photo Direction: Northeast bank, facing downstream (east)
Description: Tributary is the primary, perennial riverine system in the area (243 linear feet, 0.14 acres).

Feature: Middle Fork of the South Platte River
Date: 8/29/2020
Photo Location: Northwest bank, facing downstream (east)
Description: Tributary is the primary, perennial riverine system in the area (243 linear feet, 0.14 acres).

Feature: Middle Fork South of the Platte River
Date: 8/29/2020
Photo Direction: Northwest bank, facing upstream (west)
Description: Tributary is the primary, perennial riverine system in the area (243 linear feet, 0.14 acres).



Feature: Drainage 1
Date: 8/29//2020
Photo Location: Top of drainage facing downstream (north)
Description: Drainage is a small apparently perennial drainage (171 linear feet, 0.02 acres) that drains hillside seeps and roadside run-off into the Middle Fork of the South Platte River.

Feature: Drainage 1
Date: 8/29//2020
Photo Location: Midpoint of drainage, facing downstream (north)
Description: Drainage is a small apparently perennial drainage (171 linear feet, 0.02 acres) that drains hillside seeps and roadside run-off into the Middle Fork of the South Platte River.

Appendix F

FACWet Functional Assessment Forms

ADMINISTRATIVE CHARACTERIZATION

General Information

		Date of Evaluation:	8/21/2020
Site Name or ID:	G-12-C	Project Name:	R2 Bridge Repair
404 or Other Permit Application #:		Applicant Name:	CDOT
Evaluator Name(s):	R. Black, T. Toler, C. Phillips	Evaluator's professional position and organization:	Environmental Scientists for Stanley Consultants, Inc.

Location Information:

Site Coordinates (Decimal Degrees, e.g., 38.85, -104.96):	408111.08 m E, 4350036.28 m N	Geographic Datum Used (NAD 83):	UTM NAD83, Zone 13S
		Elevation	10,400 ft
Location Information:	Project center point is located at Bridge G-12-C on Rt. 9, northeast of Alma in Park County, CO.		
Associated stream/water body name:	Middle Fork of the South Platte River	Stream Order:	2
USGS Quadrangle Map:	Alma USGS Quad 7.5-Minute Series	Map Scale: (Circle one)	(1:24,000) 1:100,000 Other 1:
Sub basin Name (8 digit HUC):	South Platte Headwaters - 10190001	Wetland Ownership:	Private, within CDOT right-of-way

Project Information:

This evaluation is being performed at: *(Check applicable box)*
- [X] *Project Wetland*
- [ ] *Mitigation Site*

Purpose of Evaluation (check all applicable):
- [X] *Potentially Impacted Wetlands*
- [ ] *Mitigation; Pre-construction*
- [ ] *Mitigation; Post-construction*
- [ ] *Monitoring*
- [ ] *Other (Describe)*

Intent of Project: *(Check all applicable)* [ ] Restoration [ ] Enhancement [X] Creation

Total Size of Wetland Involved: (Record Area, Check and Describe Measurement Method Used)	ac.	[ ]	Measured	N/A - see notes			
		[ ]	Estimated				
Assessment Area (AA) Size (Record Area, check appropriate box. Additional spaces are used to record acreage when more than one AA is included in a single assessment)	ac.	[X]	Measured	ac. 11.06	ac.	ac.	ac.
		[ ]	Estimated	ac.	ac.	ac.	ac.

Characteristics or Method used for AA boundary determination:

Per the request of CDOT, the AA is the width of the CDOT ROW around the bridge (105ft x 135 ft) and the width of the CDOT ROW around the road (120 ft) by the requested buffer for any potential bypass design (2,000 ft in either direction from the bridge).

Notes:

AA is part of a larger wetland complex on the Middle Fork of the South Platte River and extends onto private land and was not assessed as part of this effort. Therefore, total wetland size is provided here. See Fig X - NWI.

ECOLOGICAL DESCRIPTION 1

Special Concerns

Check all that apply

- [ ] Organic soils including Histosols or Histic Epipedons are present in the AA (i.e., AA includes core fen habitat).
- [ ] Project will directly impact organic soil portions of the AA including areas possessing either Histosol soils or histic epipedons.
- [X] Organic soils are known to occur anywhere within the contiguous wetland of which the AA is part.
- [ ] The wetland is a habitat oasis in an otherwise dry or urbanized landscape?
- [ ] Federally threatened or endangered species are **KNOWN** to occur in the AA? List Below.
- [ ] Federally threatened or endangered species are **SUSPECTED** to occur in the AA?
- [ ] Species of concern according to the Colorado Natural Heritage (CNHP) are known to occur in the AA?
- [ ] The site is located within a potential conservation area or element occurrence buffer area as determined by CNHP?
- [ ] Other special concerns (please describe

HYDROGEOMORPHIC SETTING

- [X] AA wetland maintains its fundamental natural hydrogeomorphic characteristics
- [ ] AA wetland has been subject to change in HGM classes as a result of anthropogenic modification
  If the above is checked, please describe the original wetland type if discernable using the table below.
- [ ] AA wetland was created from an upland setting.

Current Conditions

Describe the hydrogeomorphic setting of the wetland by circling all conditions that apply.

HGM Setting

Water source	(Surface flow)	Groundwater	Precipitation	Unknown		
Hydrodynamics	(Unidirectional)	Vertical	Bi-directional			
Wetland Gradient	(0 - 2%)	2-4%	4-10%	>10%		
# Surface Inlets	(Over-bank)	0	1	(2)	3	>3
# Surface Outlets		0	(1)	2	3	>3
Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	AAs abut a riverine system (Middle Fork of the South Platte River, a 2nd order stream) and two drainage ditches that discharge into the riverine system.					
HGM class	(Riverine)	Slope	Depressional	Lacustrine		

Historical Conditions

Previous wetland typology

Water source	(Surface flow)	Groundwater	Precipitation	Unknown	
Hydrodynamics	(Unidirectional)	Vertical			
Geomorphic Setting (Narrative Description)	The original flow path upstream of the bridge was altered as part of the bridge construction. The latent flow path has developed into a pond system abutting the river.				
Previous HGM Class	(Riverine)	Slope	Depressional	Lacustrine	

Notes (include information on the AA's HGM subclass and regional subclass):

Original bridge construction in 1937 included rerouting the river flow path upstream of the bridge. However, this change did not alter the HGM setting class or subclass as an R2 Riverine system.

ECOLOGICAL DESCRIPTION 2

Vegetation Habitat Description

US FWS habitat classification according as reported in Cowardin et al. (1979).

System	Subsystem	Class	Subclass	Water Regime	Other Modifiers	% AA
Palustrine	Palustrine	SS	Broad-leaved deciduous	B		70
Riverine	Upper perennial	UB	Cobble-gravel	H		20
Palustrine	Palustrine	EM	Persistent	E		10
Lacustrine	Littoral; Limnoral	Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Forested (FO)	Floating vascular; Rooted vascular; Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic	**Examples** Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seas.-flood./sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)	Hypersaline(7) ; Eusaline(8); Mixosaline(9); Fresh(0); Acid(a); Circumneutral(c); Alkaline/calcareous(i); Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)	
Palustrine	Palustrine					
Riverine	Lower perennial; Upper perennial; Intermittent					

Site Map

Scale: 1 sq. =

Draw a sketch map of the site including relevant portions of the wetland, AA boundary, structures, habitat classes, and other significant features.

See attached Figure 1

Variable 1: Habitat Connectivity

The Habitat Connectivity Variable is described by two sub-variables – Neighboring Wetland and Riparian Habitat Loss and Barriers to Migration and Dispersal. These sub-variables were treated as independent variables in FACWet Version 2.0. The merging of these variables makes their structure more consistent with that of other composite variables in FACWet. The new variable configuration also makes this landscape variable more accurately reflect the interactions amongst aquatic habitats in Colorado's agricultural and urbanized landscapes, which have a naturally low density of wetlands. The two Habitat Connectivity Sub-variables are scored in exactly the same manner as their FACWet 2.0 counterparts, as described below. The Habitat Connectivity Variable score is simply the arithmetic average of the two sub-variable scores which is entered on the second page of the Variable 1 data form. If there is little or no wetland or riparian habitat in the Habitat Connectivity Envelope (defined below), then Sub-variable 1.1 is not scored.

SV 1.1 - Neighboring Wetland and Riparian Habitat Loss

(Do not score if few or no wetlands naturally exist in the HCE)

This sub-variable is a measure of how isolated from other naturally-occurring wetlands or riparian habitat the AA has become as the result of habitat destruction. To score this sub-variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within the 500-meter-wide belt surrounding the AA. This zone is called the Habitat Connectivity Envelope (HCE). In most cases the evaluator must use best professional judgment to estimate the amount of natural wetland loss. Historical photographs, National Wetland Inventory (NWI) maps, hydric soil maps can be helpful in making these determinations. Floodplain maps are especially valuable in river-dominated regions, such as the Front Range urban corridor. Evaluation of landforms and habitat patterns in the context of perceivable land use change is used to steer estimates of the amount of wetland loss within the HCE.

Rules for Scoring:

1. On the aerial photo, create a 500 m perimeter around the AA.
2. The area within this perimeter is the **Habitat Connectivity Envelope (HCE)**
3. Within the HCE, outline the current extent of naturally occurring wetland and riparian habitat. Do not include habitats such as excavated ponds or reservoir induced fringe wetlands.
4. Outline the historical extent of wetland and riparian habitats (i.e., existing natural wetlands plus those that have been destroyed).

- Use your knowledge of the history of the area and evident land use change to identify where habitat losses have occurred. Additional research can be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, soil maps, etc.

5. Calculate the area of existing and historical wetlands. Divide the area of existing wetland by the total amount of existing and historical wetland and riparian habitat, and determine the variable score using the guidelines below. Enter sub-variable score at the bottom of p.2 of the Habitat Connectivity data form.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats
<0.9 - 0.8	***B*** *Highly Functioning*	More than 80% of historical wetland habitat area within the HCE is still present (less than 20% of habitat area lost).
<0.8 - 0.7	***C*** *Functioning*	80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% of habitat area lost).
<0.7 - 0.6	***D*** *Functioning Impaired*	Less than 60 to 25% of historical wetland habitat area within the HCE is still present (more than 40 to 75% of habitat area lost).
<0.6	***F*** *Non-functioning*	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Notes:

Based on conditions observed in the field and a review of available aerial photography, there have been negligible losses to wetlands within the HCE outside of the construction of the road and bridge.

Variable 1: Habitat Connectivity p. 2

SV 1.2: Migration/Dispersal Barriers

This sub-variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

1. On the aerial photo, outline **all** existing wetland and riparian habitat areas within the HCE. This includes naturally occurring habitats, as well as those purposefully created or induced by land use change.

2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

Stressors = artificial barriers

✔	Stressors	Comments/description
	Major Highway	
X	Secondary Highway	Highway 9
X	Tertiary Roadway	Rural residential roads
	Railroad	
	Bike Path	
X	Urban Development	Residential and light commercial development buildings with fencing
	Agricultural Development	
	Artificial Water Body	
X	Fence	Fencing around buildings and along ROW
X	Ditch or Aqueduct	Ditch adjacent to road discharges into river; vegetation in ditch mowed
	Aquatic Organism Barriers	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	***B*** *Highly Functioning*	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding wetland/riparian habitat highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.8 - 0.7	***C*** *Functioning*	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of wetland/riparian habitat. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.7 - 0.6	***D*** *Functioning Impaired*	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding wetland/riparian habitat. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding wetland/riparian habitat could be functionally isolated from the AA.
<0.6	***F*** *Non-functioning*	AA is essentially isolated from surrounding wetland/riparian habitat by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and wetland/riparian habitat in the HCE.

SV 1.1 Score	.91
SV 1.2 Score	0.75

Add SV 1.1 and 1.2 scores and divide by two to calculate variable score

Variable 1 Score 0.83

Variable 2: Contributing Area

The AA's Contributing Area is defined as the 250-meter-wide zone surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to support characteristic functions of high quality wetland habitat. Depending on its condition, the contributing area can help maintain wetland condition or it can degrade it. Contributing Area condition is evaluated by considering the AA's Buffer and its Surrounding Land Use. Buffers are strips or patches of more-or-less natural upland and/or wetland habitat more than 5m wide. Buffers are contiguous with the AA boundary and they intercede between it and more intensively used lands. The AA Buffer is characterized with three sub-variables: Buffer Condition, Buffer Extent, and Average Buffer Width. The Surrounding Land Use Sub-variable considers changes within the Contributing Area that limit its capacity to support characteristic wetland functions. Many of the acute, on-site effects of land use change in the Contributing Area are specifically captured by Variables 3 - 8.

Rules for Scoring:

1. Delimit the Contributing Area on an aerial photograph as the zone within 250 meters of the outer boundary of the AA.
2. Evaluate and then rate the Buffer Condition sub-variable using the scoring guidelines. Record the score in the cell provided on the datasheet.
3. Indicate on the aerial photograph zones surrounding the AA which have ≥5m of buffer vegetation and those which do not.
4. Calculate the percentage of the AA which has a Buffer and record the value where indicated on the data sheet.
5. Rate the *Buffer Extent* Sub-variable using the scoring guidelines.
6. Determine the average Buffer width by drawing a line perpendicularly from the AA boundary to the outer extent of the buffer habitat. Measure line length and record its value on the data sheet. Repeat this process until a total of 8 lines have been sampled.
7. Calculate the average buffer width and record value on the data form. Then determine the sub-variable score using the scoring guidelines.
8. Score the Surrounding Land Use sub-variable by recording land use changes on the stressor list that affect the capacity of the landscape to support characteristic wetland functioning.
9. Enter the **lowest** of the three Buffer sub-variable scores along with the Surrounding Land Use Sub-variable score in the Contributing Area Variable scoring formula at the bottom of p. 2 of the data form. The Contributing Area Variable is the average of the two sub-variable scores

SV 2.1 - Buffer Condition

0.75 ***SV 2.1 - Buffer Condition Score***

Subvariable Score	Condition Grade	Buffer Condition Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Buffer vegetation is predominately native vegetation, human-caused disturbance of the substrate is not evident, and human visitation is minimal. Common examples: Wilderness areas, undeveloped forest and range lands.
<0.9 - 0.8	*Highly Functioning*	Buffer vegetation may have a mixed native-nonnative composition, but characteristic structure and complexity remain. Soils are mostly undisturbed or have recovered from past human disturbance. Little or only low-impact human visitation. Buffers with higher levels of substrate disturbance may be included here if the buffer is still able to maintain predominately native vegetation. Common examples: Dispursed camping areas in national forests, common in wildland parks (e.g. State Parks) and open spaces.
<0.8 - 0.7	*Functioning*	Buffer vegetation is substantially composed of non-native species. Vegetation structure may be somewhat altered, such as by brush clearing. Moderate substrate distrbance and compaction occurs, and small pockets of greater disturbance may exist. Common examples: City natural areas, mountain hay meadows
<0.7 - 0.6	*Functioning Impaired*	Buffer vegetation is substantially composed of non-native species and vegetation structure has been strongly altered by the complete removal of one or more strata. Soil disturbance and the intensity of human visitation are generally high. Common examples: Open lands around resourc extraction sites (e.g., gravel mines), clear cut logging areas, ski slopes.
<0.6	*Non-functioning*	Buffer is nearly or entirely absent.

SV 2.2 - Buffer Extent

85% Precent of AA with Buffer

0.85 ***SV 2.2 - Buffer Extent***

Subvariable Score	Condition Class	% Buffer Scoring Guidelines
1.0 - 0.9	*Reference Standard*	90 - 100% of AA with Buffer
<0.9 - 0.8	*Highly Functioning*	70-90% of AA with Buffer
<0.8 - 0.7	*Functioning*	51-69% of AA with Buffer
<0.7 - 0.6	*Functioning Impaired*	26-50% of AA with Buffer
<0.6	*Non-functioning*	0-25% of AA with Buffer

Variable 2: Contributing Area (p. 2)

SV 2.3 - Average Buffer Width

Record measured buffer widths in the spaces below and average.

Line #	1	2	3	4	5	6	7	8	Avg. Buffer Width (m)
Buffer Width (m)	98	65	18	17	4	108	250	22	72.7

0.77

SV 2.3 - Average Buffer Width Score

Subvariable Score	Condition Grade	Buffer Width Scoring Guidelines
1.0 - 0.9	*Reference Standard*	Average Buffer width is 190-250m
<0.9 - 0.8	*Highly Functioning*	Average Buffer width is 101-189m
<0.8 - 0.7	*Functioning*	Average Buffer width is 31-100m
<0.7 - 0.6	*Functioning Impaired*	Average Buffer width is 6-30m
<0.6	*Non-functioning*	Average Buffer width is 0-5m

SV 2.4 - Surrounding Land Use

0.75

SV 2.4 - Surrounding Land Use Score

Catalog and characterize land use changes in the surrounding landscape and score.

Stressors = Land Use Changes

✓	Stressors	Comments/description
X	Industrial/commercial	Industrial facility with parking lot, fencing
	Urban	
X	Residential	Rural residences and roads
	Rural	
	Dryland Farming	
	Intensive Agriculture	
	Orchards or Nurseries	
	Livestock Grazing	
X	Transportation Corridor	Highway 9 with bridge crossing, rural roads
	Urban Parklands	
	Dams/impoundments	
	Artificial Water body	
	Physical Resource Extraction	
	Biological Resource Extraction	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	No appreciable land use change has been imposed Surrounding Landscape.
<0.9 - 0.8	***B*** *Highly Functioning*	Some land use change has occurred in the Surrounding Landscape, but changes have minimal effect on the the landscape's capacity to support characteristic aquatic functioning, either because land use is not intensive, for example haying, light grazing, or low intensity silviculture, or more substantial changes occur in approximately less than 10% of the area.
<0.8 - 0.7	***C*** *Functioning*	Surrounding Landscape has been subjected to a marked shift in land use, however, the land retains much of its capacity to support natural wetland function and it is not an overt source of pollutants or sediment. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.
<0.7 - 0.6	***D*** *Functioning Impaired*	Land use changes within the Surrounding Landscape has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surfaces; considerable in-flow urban runoff or fertilizer-rich waters common. Supportive capacity of the land has been greatly diminished but not totally extinguished. Intensively logged areas, low-density urban developments, some urban parklands and many cropping situations would
<0.6	***F*** *Non-functioning*	The Surrounding Landscape is essentially comletely developed or is otherwise a cause of severe ecological stress on wetland habitats. Commercial developments or highly urban landscapes generally rate a score of less than 0.6.

	Buffer Score (Lowest score)		Surrounding Land Use				
(	0.75	+	0.7	) ÷	2	= **Variable 2 Score**	0.73

Variable 3: Water Source

*This variable is concerned with **up-gradient** hydrologic connectivity. It is a measure of impacts to the AA's water source, including the quantity and timing of water delivery, and the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.*

Scoring rules:

1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.

2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

✔	Stressors	Comments/description
X	Ditches or Drains (tile, etc.)	
X	Dams	Columbia Reservoir, Montgomery Reservoir
X	Diversions	River flows were altered as part of bridge construction in 1937
?	Groundwater pumping	Possible residential wells?
	Draw-downs	
X	Culverts or Constrictions	various culverts from road crossings
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
X	Storm Drain/Urban Runoff	From SH 9 and other roads, and commercial/residential buildings
X	Impermeable Surface Runoff	From roadways such as SH 9
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Grade	Depletion	Augmentation
1.0 - 0.9	***A*** *Reference Standard*	Unnatural drawdown events minor, rare or non-existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non-existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	***B*** *Highly Functioning*	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or capacity of water to perform work.
<0.8 - 0.7	***C*** *Functioning*	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial increase of peak flows or capacity of water to perform work.
<0.7 - 0.6	***D*** *Functioning Impaired*	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or capacity of water to perform work. **Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.**
<0.6	***F*** *Non-functioning*	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 3 Score 0.83

Variable 4: Water Distribution

This variable is concerned with hydrologic connectivity ***within*** *the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally result from geomorphic modifications within the AA. To score this variable, identify stressors within the AA that alter flow patterns and impact the hydrograph of the AA, including localized increases or decreases to the depth or duration of the water table or surface water.*

Because the wetland's ability to distribute water in a characteristic fashion is fundamentally dependent on the condition of its water source, ***in most cases the Water Source variable score will define the upper limit Water Distribution score****. For example, if the Water Source variable is rated at 0.85, the Water Distribution score will usually have the potential to attain a maximum score of 0.85. Additional stressors within or outside the lower end of the AA effecting water distribution (e.g., ditches and levees) will reduce the score from the maximum value.*

Scoring rules:

1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.

2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. In most cases, the Water Source variable score will set the upper limit for the Water Distribution score.

✔	Stressors	Comments/description
	Alteration of Water Source	
X	Ditches	Two ditches discharge into adjacent river
	Ponding/Impoundment	
X	Culverts	water passes through a culvert bridge, but flows are not significantly impeded
X	Road Grades	Highway 9 abuts wetlands
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Grade	Non-riverine	Riverine
1.0 - 0.9	***A*** *Reference Standard*	Little or no alteration has been made to the way in which water is distributed throughout the wetland. AA maintains a natural hydrologic regime.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	***B*** *Highly Functioning*	Less than 10% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	***C*** *Functioning*	Between 10 and 33% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	***D*** *Functioning Impaired*	33 to 66% of the AA is affected by *in situ* hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	***F*** *Non-functioning*	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system, generally exhibited as a conversion to upland or deep water habitat.	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 4 Score 0.83

Variable 5: Water Outflow

This variable is concerned with ***down-gradient*** *hydrologic connectivity and the flow of water and water-borne materials and energy out of the AA. In particular it illustrates the degree to which the AA can support the functioning of down-gradient habitats. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, infiltration/groundwater recharge, and the energetic characteristics of water delivered to dependent habitats. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA and their ability it support down-gradient habitats in a manner consistent with their HGM (regional) subclass.*

Because the wetland's ability to export water and materials in a characteristic fashion is to a very large degree dependent the condition of its water source, as with the Water Distribution variable, ***in most cases the Water Source variable score will define the upper limit Water Outflow score****.*

Scoring rules:

1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.

2.Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials. In most cases the Water Source variable will set the upper limit for the Water Outflow score.

✔	Stressors	Comments/description
	Alteration of Water Source	
X	Ditches	Ditch discharges to river, facilitating water outflow from AA
	Dikes/Levees	
X	Road Grades	Highway 9 is a barrier for groundwater and subsurface outflows
X	Culverts	Facilitates outflows from AA
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	***B*** *Highly Functioning*	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.
<0.8 - 0.7	***C*** *Functioning*	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	***D*** *Functioning Impaired*	Outflow at all stages is moderately to highly impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics severely disrupted.
<0.6	***F*** *Non-functioning*	The natural outflow regime is profoundly impaired. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.

Variable 5 Score 0.8

Variable 6: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, dikes, sedimentation due to absence of flushing floods, etc. In riverine systems, geomorphic changes to the stream channel should be considered if the channel is within the AA (i.e, small is size). Alterations may involve the bed and bank (substrate embeddedness or morphological changes), stream instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland surface hydrology and water relations with vegetation. Geomorphic alterations can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment such as the redox state or nutrient composition in the rooting zone. In rating this variable, ***do not*** *include these resultant effects of geomorphic change; rather focus on the physical impacts* ***within the footprint*** *of the alteration* ***within the AA*** *– For example, the width and depth of a ditch or the size of a levee* ***within the AA*** *would describe the extent of the stressors. The secondary effects of geomorphic change are addressed by other variables. All alterations to geomorphology should be evaluated including small-scale impacts such as pugging, hoof sheer, and sedimentation which*

Scoring Rules:

1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✓		Stressors	Comments
	General	Dredging/Excavation/Mining	
X		Fill, including dikes, road grades, etc	Road fill is common in substrate along the road, adjacent uplands, and toe of slope below road
		Grading	
X		Compaction	Road fill compaction along road shoulder
		Plowing/Disking	
		Excessive Sedimentation	
		Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
	Channels Only	Channel Instability/Over Widening	
X		Excessive Bank Erosion	Head cutting observed along bank and wing wall on upstream side of bridge
		Channelization	
X		Reconfigured Stream Channels	Stream flow was altered during bridge construction. Remnants of old stream bed have crated adjacent ponds.
		Artificial Banks/Shoreline	
		Beaver Dam Removal	
		Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.
<0.9 - 0.8	***B*** *Highly Functioning*	Alterations to topography result in small but detectable changes to habitat conditions in some or all of the AA; or more severe impacts exist but affect less than 10% of the AA.
<0.8 - 0.7	***C*** *Functioning*	Changes to AA topography may be pervasive but generally mild to moderate in severity. May include patches of more significant habitat alteration; or more severe alterations affect up to 20 % of the AA.
<0.7 - 0.6	***D*** *Functioning Impaired*	At least one important surface type or landform has been eliminated or created; microtopography has been strongly impacted throughout most or all of the AA; or more severe alterations affect up to 50% of the AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.
<0.6	***F*** *Non-functioning*	Pervasive geomorphic alterations have caused a fundamental change in site character and functioning, commonly resulting in a conversion to upland or deepwater habitat.

Variable 6 Score 0.8

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants, water and soil characteristics. The origin of pollutants may be within or outside the AA. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of stressors is often identified by the presence of indirect indicators. Five sub-variables are used to describe the Water and Soil Chemical Environment: Nutrient Enrichment/Eutrophication/Oxygen; Sedimentation/Turbidity; Toxic Contamination/pH; Temperature; and Soil Chemistry and Redox Potential. Utilization of web-based data mining tools is highly recommended to help inform and support variable scores.

Scoring rules:

1. Stressors are grouped into sub-variables which have a similar signature or set of causes.
2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
3. For each sub-variable, determine its score using the scoring guideline table provided on the second page of the scoring sheet. Scoring sub-variables is carried out in exactly the same way as normal variable scoring.
 -If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
5. The lowest sub-variable score sets the letter grade range. The composite of sub-variables influences the score within that range.

Sub-variable	Stressor Indicator	✔	Comments	Sub-variable Score
SV 7.1 Nutrient Enrichment/ Eutrophication/ Oxygen (D.O.)	Livestock			1.0
	Agricultural Runoff			
	Septic/Sewage	?	Possible residential septic?	
	Excessive Algae or Aquatic Veg.			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.2 Sedimentation/ Turbidity	Excessive Erosion			1.0
	Excessive Deposition			
	Fine Sediment Plumes			
	Agricultural Runoff			
	Excessive Turbidity			
	Nearby Construction Site			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.3 Toxic contamination/ pH	Recent Chemical Spills			0.7
	Nearby Industrial Sites			
	Road Drainage/Runoff	X	SH 9 and other roads	
	Livestock			
	Agricultural Runoff			
	Storm Water Runoff	X	From roads, buildings, etc.	
	Fish/Wildlife Impacts			
	Vegetation Impacts			
	Cumulative Watershed NPS			
	Acid Mine Drainage			
	Point Source Discharge			
	CDPHE Impairment/TMDL List			
	Metal staining on rocks and veg.			
SV 7.4 Temperature	Excessive Temperature Regime			0.95
	Lack of Shading	X	Lack of shade is part of natural system	
	Reservoir/Power Plant Discharge			
	Industrial Discharge			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.5 Soil chemistry/ Redox potential	Unnatural Saturation/Desaturation			1.0
	Mechanical Soil Disturbance			
	Dumping/introduced Soil			
	CDPHE Impairment/TMDL List			

Variable 7: Water and Soil Chemical Environment p.2

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Stress indicators not present or trivial.
<0.9 - 0.8	***B*** *Highly Functioning*	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7	***C*** *Functioning*	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6	***D*** *Functioning Impaired*	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	***F*** *Non-functioning*	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each sub-variable score from p. 1 of the V7 data form and calculate the sum.

Nutrient enrichment/ Eutrophication/ Oxygen (D.O.)		Sedimentation/ Turbidity		Toxic contamination/ pH		Temperature		Soil chemistry/ Redox potential		Sum of Sub-variable Scores
1	+	1	+	0.7	+	0.95	+	1	=	4.65

Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Grade	Scoring Rules		
		Single Factor		**Composite Score**
1.0 - 0.9	***A*** *Reference Standard*	No single factor scores < 0.9		The factor scores sum > 4.5
<0.9 - 0.8	***B*** *Highly Functioning*	Any single factor scores ≥ 0.8 but < 0.9		The factor scores sum >4.0 but ≤4.5
<0.8 - 0.7	***C*** *Functioning*	Any single factor scores ≥ 7.0 but < 0.8	X	The factor scores sum >3.5 but ≤ 4.0
<0.7 - 0.6	***D*** *Functioning Impaired*	Any single factor scores ≥ 0.6 but <0.7		The factor scores sum >3.0 but ≤3.5
< 0.6	***F*** *Non-functioning*	Any single factor scores < 0.6		The factor scores sum < 3.0

Variable 7 Score 0.78

Variable 8: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It particularly focuses on the wetland's ability to perform higher-order functions such as support of wildlife populations, and influence primary functions such as flood-flow attenuation, channel stabilization and sediment retention. Score this variable by listing stressors that have affected the structure, diversity, composition and cover of each vegetation stratum that would normally be present in the HGM (regional) subclass being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition or from the natural range of variability exhibited the HGM subclass or regional subclass. This variable has four sub-variables, each corresponding to a stratum of vegetation: Tree Canopy; Shrub Layer; Herbaceous Layer; and Aquatics.

Rules for Scoring:

1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination.

2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.

3. Estimate and record the current coverage of each vegetation layer at the top of the table.

4. Record the Reference Standard or expected percent coverage of each vegetation layer to create the sub-variable weighting factor. The condition of predominant vegetation layers has a greater influence on the variable score than do minor components.

5. Enter the percent cover values as decimals in the row of the stressor table labeled " Reference/expected Percent Cove of Layer". Note, percentages will often sum to more than 100% (1.0).

6. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table. The difference between the expected and observed stratum coverages is one measure of stratum alteration.

7. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score". If a stratum has been wholly removed score it as 0.5.

8. Multiply each layer's *Reference Percent Cover of Layer* score by its Veg. Layer Sub-variable scores and enter the products in the labled cells. These are the weighted sub-variable scores. Individually sum the *Reference Percent Cover of Layer* and *Weighted Sub-variables scores.*

9. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 8 score. Enter this number in the labeled box at the bottom of this page.

	Vegetation Layers				
Current % Coverage of Layer		65	50		
Stressor	**Tree**	**Shrub**	**Herb**	**Aquatic**	**Comments**
Noxious Weeds					
Exotic/Invasive spp.			X		Canada thistle
Tree Harvest					
Brush Cutting/Shrub Removal		X			Brush removal along roadside shoulder (adjacent to AA)
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying			X		Mowing along roadside shoulder (adjacent to AA)
Herbicide					
Loss of Zonation/Homogenization					
Dewatering					
Over Saturation					
DIFFERENCE BETWEEN CURRENT COVERAGE AND REFERENCE/EXPECTED		0	0		

Reference/Expected % Cover of Layer		+	100	+	100	+		= 200
	X		X		X		X	
Veg. Layer Sub-variable Score			0.89		0.85			÷
	=		=		=		=	
Weighted Sub-variable Score		+	89	+	85	+		= 174

See sub-variable scoring guidelines on following page

Variable 8 Score 0.87

Variable 8: Vegetation Structure and Complexity p. 2

Sub-variable 8 Scoring Guidelines

Based on the list of stressors identified above, rate the severity of their cumulative effect on vegetation structure and complexity for each vegetation layer.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	***A*** *Reference Standard*	Stressors not present or with an intensity low enough as to not detectably affect the structure, diversity or composition of the vegetation layer.
<0.9 - 0.8	***B*** *Highly Functioning*	Stressors present at intensity levels sufficient to cause detectable, but minor, changes in layer composition. Stress related change should generally be less than 10% for any given attribute (e.g., 10% cover of invasive, 10% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as high as 33% for a given attribute if stressors are confined to patches comprising less than 10% of the wetland.
<0.8 - 0.7	***C*** *Functioning*	Stressors present with enough intensity to cause significant changes in the character of vegetation, including alteration of layer coverage, structural complexity and species composition. The vegetation layer retains its essential character though. AA's with a high proportion of non-native grasses will commonly fall in this class. Stress related change should generally be less than 33% for any given attribute (e.g., 33% cover of invasive, 33% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 66% for a given attribute if stressors are confined to patches comprising less than 25% of the wetland.
<0.7 - 0.6	***D*** *Functioning Impaired*	Stressor intensity severe enough to cause profound changes to the fundamental character of the vegetation layer. Stress-related change should generally be less than 66% for any given attribute (e.g., 66% cover of invasive, 66% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 80% of a given attribute if stressors are confined to patches comprising less than 50% of the wetland.
<0.6	***F*** *Non-functioning*	Vegetation layer has been completely removed or altered to the extent that is no longer comparable to the natural structure, diversity and composition.

FACWet Score Card

Scoring Procedure:

1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in crossed cells lacking labels.
3. Add the variable scores to calculate the total functional points achieved for each function.
4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted
5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIABLE SCORE TABLE

Buffer & Landscape Context	**Variable 1:**	**Habitat Connectivity (Connect)**	0.83
	Variable 2:	**Contributing Area (CA)**	0.725
Hydrology	**Variable 3:**	**Water Source (Source)**	0.83
	Variable 4:	**Water Distribution (Dist)**	0.83
	Variable 5:	**Water Outflow (Outflow)**	0.8
Abiotic and Biotic Habitat	**Variable 6:**	**Geomorphology (Geom)**	0.8
	Variable 7:	**Chemical Environment (Chem)**	0.78
	Variable 8:	**Vegetation Structure and Complexity (Veg)**	0.87

Functional Capacity Indices

Function 1 -- Support of Characteristic Wildlife Habitat

$V1_{connect}$	+	$V2_{CA}$	+	$(2 \times V8_{veg})$	+		+		+		=	Total Functional Points	÷	4	=	FCI
0.83	+	0.725	+	1.74	+		+		+		=	3.295	÷	4	=	0.82

Function 2 -- Support of Characteristic Fish/aquatic Habitat

$(3 \times V3_{source})$	+	$(2 \times V4_{dist})$	+	$(2 \times V5_{outflow})$	+	$V6_{geom}$	+	$V7_{chem}$	+		=		÷		=	
2.49	+	1.66	+	1.6	+	0.8	+	0.78	+		=	7.33	÷	9	=	0.81

Function 3 -- Flood Attenuation

$V2_{CA}$	+	$(2 \times V3_{source})$	+	$(2 \times V4_{dist})$	+	$(2 \times V5_{outflow})$	+	$V6_{geom}$	+	$V8_{veg}$	=		÷		=	
0.725	+	1.66	+	1.66	+	1.6	+	0.8	+	0.87	=	8.19	÷	9	=	0.81

Function 4 -- Short- and Long-term Water Storage

$V3_{source}$	+	$(2 \times V4_{dist})$	+	$(2 \times V5_{outflow})$	+	$V6_{geom}$	+		+		=		÷		=	
0.83	+	1.66	+	1.6	+	0.8	+		+		=	4.89	÷	6	=	0.82

Function 5 -- Nutrient/Toxicant Removal

$(2 \times V2_{CA})$	+	$(2 \times V4_{dist})$	+	$V6_{geom}$	+	$V7_{chem}$	+		+		=		÷		=	
1.45	+	1.66	+	0.8	+	0.78	+		+		=	4.69	÷	6	=	0.78

Function 6 -- Sediment Retention/Shoreline Stabilization

$V2_{CA}$	+	$(2 \times V6_{geom})$	+	$(2 \times V8_{veg})$	+		+		+		=		÷		=	
0.725	+	1.6	+	0.87	+		+		+		=	5.81	÷	5	=	0.80

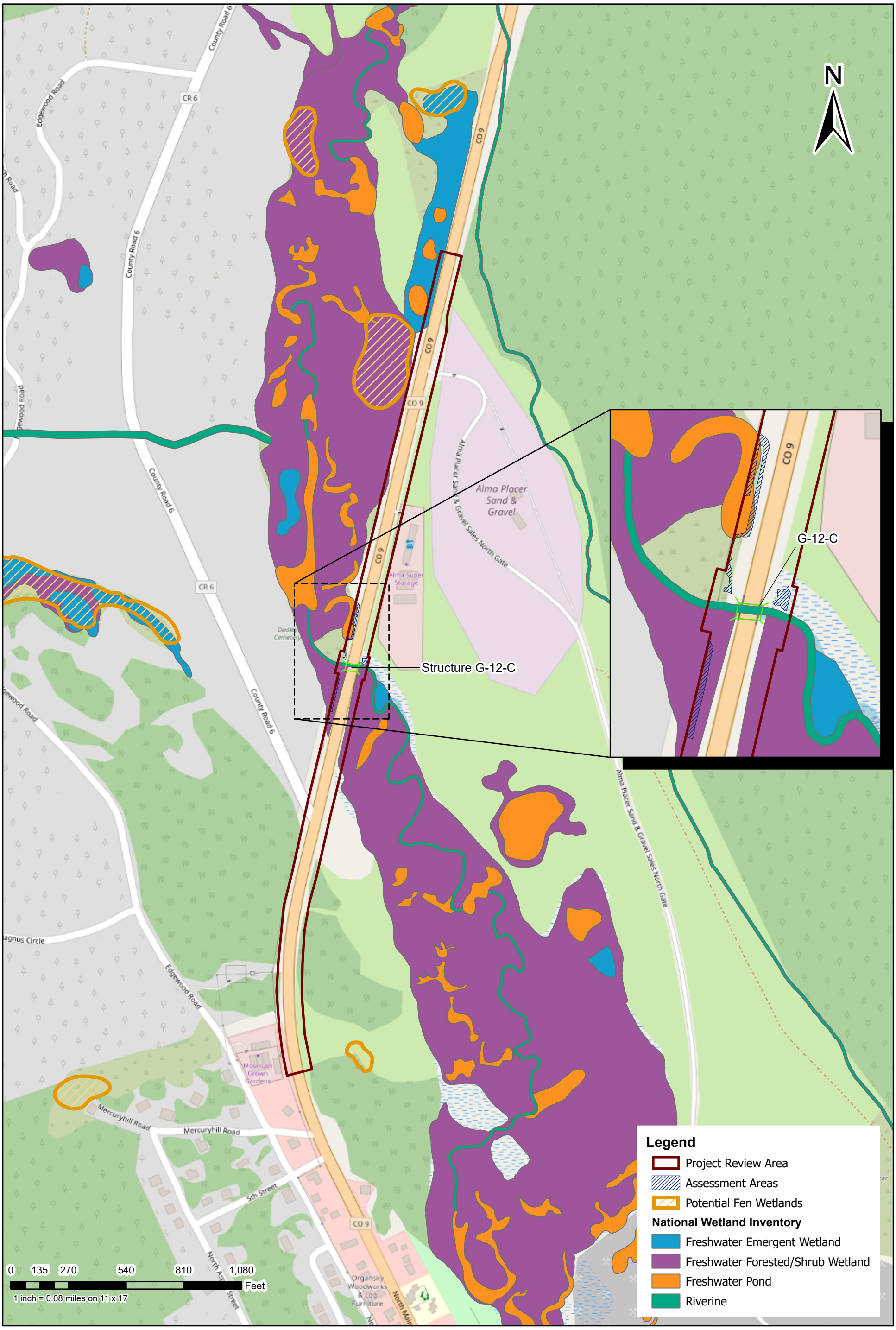
Function 7 -- Production Export/Food Chain Support

$V1_{connect}$	+	$(2 \times V5_{outflow})$	+	$V6_{geom}$	+	$V7_{chem}$	+	$(2 \times V8_{veg})$	+		=		÷		=	
0.83	+	1.6	+	0.8	+	0.78	+	1.74	+		=	5.75	÷	7	=	0.82

Sum of Individual FCI Scores 5.66

Divide by the Number of Functions Scored ÷ 7

Composite FCI Score 0.81



Data Source: Stanley Consultants, Inc., CDOT
Image Source: ArcGIS Online, OpenStreetMap

COLORADO DEPARTMENT OF TRANSPORTATION
Region 2 Bridge Rebuild Project - Bridge G-12-C
Functional Assessment of Colorado Wetlands

Figure 1
Site Map

Stanley Consultants INC.

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Appendix G

CDOT Draft Programmatic
Wetland Findings Report

DRAFT Wetland Findings Report: Region 2 Bridge Rebuild Project

Bridge G-12-C

This wetland finding has been written in accordance with Executive Order 11990, "Protection of Wetlands" and in accordance with 23 CFR 771, 23 CFR 777, and Technical Advisory T6640.8A.

Project Description and Location

The objective of the CDOT Region 2 Bridge Bundle Design Build project is to replace rural structures spread across highway corridors in southern and western Colorado. This structure, G-12-C, is located on SH 9 near Alma, Colorado. This design build project is funded by the USDOT FHWA Competitive Highway Bridge Program grant (14 structures, Project No. 23558).

Bridge G-12-C is located on State Highway (SH) 9 at Mile Post (MP) 71.44, approximately 0.8 miles north of Alma, CO. The bridge is large, double culvert (2, 10 ft by 10ft, 36-foot long) that crosses over the Middle Fork of the South Platte River. The Project will replace this culvert with double concrete box culvert (2 cell, 10 ft by 5 ft). During construction of the new structure, the existing culvert will likely be split to allow work on one side of the structure and to accommodate traffic on the other side. The area of disturbance will be restricted to the limits of the right-of-way (ROW). Once the bridge is complete and ready for use, any disturbed areas will be restored to original contours and reseeded.

The double culvert (Structure G-12-C) was built in 1938 on SH 9 which is a key corridor connecting residents and tourists from Colorado Springs and southern Colorado to the recreational activities in the Rocky Mountains. The structure is dilapidated and in poor condition, requiring frequent inspection and repair, including patching of concrete and replacement of wing walls. Construction standards 80 years ago allowed the use of local river stones in the concrete mix, which does not meet current construction standards. This bridge is well past its replacement life and is not up to current construction and safety standards and must be replaced to prevent potential failure.

Wetland Summary

This delineation reports on the finding at the CDOT bridge G-12-C survey area (2.6 acres), where three riparian wetlands (PSS: 0.02, 0.06. and 0.04 acres) were recorded along with the OHWM for the Middle Fork of the South Platte River (R3UB1H: 0.14 acres and 243 linear feet) and a small adjacent drainage (R5UB3H: 0.02 acres and 171 linear feet) that flows into the river. The wetlands directly abut or are below the river OHWM and are dominated by willows and rushes. The Middle Fork of the South Platte River is a perennial water containing areas of riparian habitats, braided channels, and other wetlands including a potential fen wetland approximately 0.22 miles to the north. The small drainage observed appears to drain not only the edge of the roadway but also small seeps from the adjacent hillside.

The Functional Assessment of Colorado Wetlands (FACWet) determined this wetland complex has a score of 0.81.

Wetland Impacts

- Permanent and temporary impact summary, size, and cause
- Section 404 permitting assumptions

Wetland Mitigation

- Brief summary of specific measures to avoid and minimize wetland impacts
- Compensatory mitigation decision and justification

Based on the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands. The proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.

Appendix H

Signed Property Access Letter

(not included; needs to be obtained prior to permitting efforts)