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WETLAND FINDING REPORT

US 287 Lamar Reliever Route Environmental Assessment Prowers County, Colorado

Prepared For:

Colorado Department of Transportation Region 2 2402 South Main Street Lamar, Colorado 81052

Pinyon Project No.:

#1/12-750-05.8000

CDOT Project No.:

C 2871-026 (SA 11637)







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I. Introduction

The following is a wetland finding/wetland finding amendment for U.S. 287 at Lamar Reliever Route, (Colorado Department of Transportation [CDOT] Project Number C2871-026, Subaccount 11637) and has been written in compliance with Executive Order 11990, "Protection of Wetlands," and is in accordance with 23 CFR 771, 23 CFR 777, and Technical Advisory T6640.8A.

I.I Project Location

The proposed project location is east of the Town of Lamar, located in Prowers County, Colorado (Figure I), and would result in a reliever route for United States Highway 287 (US 287) and United States Highway 50 (US 50). The proposed reliever route would start near County Road CC at mile post 72.8 (on US 287) head east and then north, crossing US 50 and the Arkansas River before heading west again and reconnecting with the existing US 287/US 50 alignment at mile post 433.2 on US 50/80.2 on US 287. The approximate geographical location of the center of the project is decimal degree coordinates (North American Datum 1983 [NAD 83]) latitude 38.08762°, longitude -102.588621°, located on United States Geological Quadrant maps Lamar East (USGS 1979a) and Lamar West (USGS 1979b). The project is located within Sections 19, 20, 28, 29, 30, 32, 33, and 34 of Township 22 South, Range 46 West and Sections 4, 9, 16, 19, 20, 21, 29, 30, 31, 32 of Township 23 South, Range 46 West of the Sixth Principal Meridian. The elevation of the site ranges from approximately 3,605 to 3,788 feet above mean sea level.

1.2 Project Description

The proposed project will construct a reliever route for US 287 and US 50 around the City of Lamar, Colorado ("Reliever Route"). Currently, the highway runs directly through the center of Lamar's business district. The purpose of the reliever route is to improve the safety of U.S. 287/Main Street through Lamar and increase the efficiency of long distance truck traffic traveling through the region. CDOT initiated a Feasibility Study in early 1999. As a result of this evaluation, a preferred corridor was identified on the east side of Lamar.

The Reliever Route would be implemented in phases, as growth occurs and traffic increases in the study area and as funding becomes available. The two-lane interim phase could be in place for a number of years before the ultimate phase is completed. This approach to project implementation addresses those improvements that are needed first and provides the flexibility to implement improvements as needs arise and additional funding becomes available.

During the interim phase, the Reliever Route would be constructed as a two-lane facility. The 72-foot-wide median and second set of travel lanes would not be constructed in the interim phase. The interim two-lane configuration would address local mobility and safety concerns by providing a more appropriate route for through-traffic. At the time of this report, whether the north-bound or south-bound lanes would be built as the interim phase is not known; therefore, both options are included. The ultimate phase would consist of a four-lane divided facility.

In addition to building the Reliever Route, the project would involve building 19 new bridges; 12 bridges would be constructed during either the north- or south-bound interim phase. The bridges are to be built over the open waterways; the largest would be over the Arkansas River. Wetlands in the project area generally occur along the Arkansas River within the riparian zone and along irrigation ditches as



fringe wetlands. Construction of the Reliever Route will directly impact these open waters and wetlands since they run perpendicular to this project corridor. However, permanent and temporary impacts have been minimized to the greatest extent practicable.

This Wetland Finding report has been developed in support of an Environmental Assessment (EA) for this project, to provide detail both on the affected environment of the proposed corridor as it relates to wetlands and/or open water and on the potential impacts from the project to those resources.



2. Methods

Pinyon biologists Elly Weber and Tim DeMasters visited the site on October 22 and 23, and Mr. DeMasters revisited the site December 10-12, 2012, to delineate wetlands within the project area. While in the field, wetland and open water boundaries were recorded with a Trimble Geo XH global positioning system (GPS) unit. The GPS data were downloaded and mapped in ArcGIS 10 mapping software. Photos of wetland areas were taken while in the field (Appendix A).

The wetland delineation was completed in accordance with the 1987 U.S. Army Corps of Engineers' (USACE) Wetland Delineation Manual (Wetland Training Institute, 1987), the 2010 Great Plains Regional Supplement (USACE, 2010), and CDOT's Functional Assessment of Colorado Wetlands (FACWet) methodology (Johnson, et al., 2011). Wetlands were defined by vegetative, hydrologic, and soil features, and the data were recorded onto field Wetland Determination Data Forms (Appendix B). Sampling points used to record these three features were placed in representative locations within each wetland area as defined by vegetation type and location along water features.

Vegetation was identified and documented within the strata-specific sampling radii recommended by the USACE (30 feet for trees, 15 feet for shrubs, five feet for herbs, and 15 feet for woody vines). Additional plant species located outside of the sampling point, but within the sampled plant community, were noted on the data forms as needed to better describe the nearby vegetation. Wetland indicator status for plant species was referenced using the "National Wetland Plant List Final Ratings" (USACE, 2012). Species were classified as obligate wetland species (OBL), facultative wetland species (FACW), FAC (facultative species), FACU (facultative upland), or UPL (upland species). A plus (+) or minus (-) sign represented species nearer to wetter or drier ends of the indicator categories, respectively. Plant species classified as FAC, FACW, or OBL, were considered hydrophytic plants, and wetland indicators. Wetlands were also classified using the Cowardin classification system (Cowardin, et al., 1979). Classifications found at this project site are described in Section 3.

Hydrology and soil data were also collected at the sampling points. Hydrology indicators included topographic position, presence of standing water and/or saturated soil, profile condition, drainage pattern, water marks, sediment deposits, and/or oxidized root channels in the upper 18 inches of the soil profile.

Wetland soil indicators included presence of color streaking (mottling), gleying (greyish coloration), reducing conditions, hydrogen sulfide odor, high organic content and organic matter and streaking in the surface layer of sandy soils. Soil pits were hand-excavated within, and adjacent to, potential wetlands to verify indicators of vegetation, wetland hydrology and hydric soils.

Per the FACWet methodology, the Area of Interest (AOI) was defined by adding a perimeter of 25 meters to the extent of direct and indirect impacts. Within the AOI, identified areas of target habitat were defined as Assessment Areas (AA). Targeted habitat for this project included any open water, wetlands, or adjacent riparian vegetation. The FACWet data forms were completed and included in this report as Appendix C.



3. Results

3.1 General Site Conditions

The proposed location for this project is in a rural, agricultural area east of the Town of Lamar (Figure I). The natural vegetation, soils, and hydrology in most of the project area have been altered by agricultural activities such as growing crops, livestock grazing, and concentrated animal feeding operations.

3.1.1 Upland Vegetation

In general, the upland landscape noted during this survey consisted of plowed fields with agricultural crops as the dominant vegetation present. The upland areas adjacent to County Road C-C 80 in the southern portion of the site consisted primarily of native and introduced grasses and herbaceous plants. The dominant grasses included smooth brome (*Bromus inermis*), Japanese brome (*Bromus japonicus*) and buffalograss (*Bouteloua dactiloydes*). The dominant herbaceous plants included common sunflower (*Helianthus annuus*), Great Plains yucca (*Yucca glauca*), broom snakeweed (*Gutierrez sarothrae*), curlycup gumweed (*Grindelia squarrosa*), and Russian thistle (*Salsola kali*). The upland areas immediately adjacent to the Arkansas River consisted of dense stands of kochia (*Bassia scoparia*) and dead snags of sandbar willow (*Salix exigua*) and tamarisk (*Tamarisk ramosissima*). Based on a visual observation, a broad-spectrum herbicide may have been applied to the areas near the river, and then the vegetation had been burned in an effort to control the tamarisk. The wetland vegetation is described below in Section 3.2.

3.1.2 General Soils

The observed soils were variable across the site. The soils were typically sandy near the Arkansas River, and tended to be loam or clay loam in the other areas (Appendix B). There are nine soil types located within the project area where wetlands occur (USDA, 2012). These were:

- Colby silt loam, 0-1% slopes- is classified as well-drained, and all layers are silt loam. These soils are generally found on terrace landforms. Depth to the water table or restrictive feature, which is defined as either bedrock or the water table, is generally more than 80 inches.
- Kornman clay loam, sand substratum, 0-1 % slopes- is classified as well-drained, consisting of a clay loam upper, a sandy loam to loamy fine sand middle layer, and a very gravelly loamy sand lower layer. These soils are generally found in flood plains and on terraces. Depth to the water table or restrictive feature is generally more than 80 inches.
- Las clay loam- is classified as moderately well-drained, consisting of a clay loam upper and middle
 layers, and a sand lower layer. These soils are generally found in flood plains and on terraces.
 Depth to the water table is typically between 24 and 36 inches, and depth to restrictive feature
 is generally more than 80 inches.
- Las loam- is classified as moderately well-drained, consisting of a loam upper layer, a clay loam middle layer, and a sand lower layer. These soils are generally found in flood plains and on terraces. Depth to the water table is typically between 24 and 36 inches, and depth to restrictive feature is generally more than 80 inches.



- Lincoln sand- is classified as excessively drained, consisting of a sand upper layer and a stratified loamy fine sand to sandy loam middle layer, and a stratified sand to gravelly sand lower layer. These soils are generally found in flood plains and on terraces. Depth to the water table or restrictive feature is generally more than 80 inches.
- Nepesta clay loam, 1-3% slopes- is classified as well drained, consisting of a clay loam upper layer, a silty clay loam middle layer, and a light silty clay loam lower layer. These soils are generally found on terraces and alluvial fans. Depth to the water table or restrictive feature is generally more than 80 inches.
- Rocky Ford clay loam, 0-1% slopes- is classified as well drained, consisting of a clay loam upper layer, silty clay loam middle layer, and a silt loam lower layer. These soils are generally found in flood plains and terraces. Depth to the water table or restrictive feature is generally more than 80 inches.
- Rocky Ford clay loam, 1-3% slopes- is classified as well drained, consisting of a clay loam upper layer, silty clay loam middle layer, and a silt loam lower layer. These soils are generally found in flood plains or on terraces. Depth to water table or restrictive feature is generally more than 80 inches.
- Tivoli sand- is classified as excessively drained, consisting entirely of sand layers. These soils are generally found on hills and alluvial fans. Depth to the water table or restrictive feature is generally more than 80 inches.

3.2 Open Waters and Wetlands

3.2.1 Open Waters

Several hydrologic features were present within the project area, were delineated, and are referred to as open water rather than Waters of the US, since no official determination of the jurisdictional status of these water bodies had been request specifically for this project from USACE at the time of this report. These included the Arkansas River, two smaller natural drainage features, five canals, two unnamed irrigation ditches, three pond areas, and one subirrigated wetland (Figures 2a to 2b). The natural drainage features were Willow Creek and Markham Arroyo. The canals were the Fort Bent Canal, Lamar Canal, Hyde Canal, Amity Canal, and Vista del Rio Ditch. There were also many small, private lateral irrigation ditches throughout the site that provide water for agricultural purposes as well as several small ponds and a subirrigated open meadow. Those with wetlands and/or open water and therefore of concern for this project are noted below.

Natural drainage features

- o Arkansas River (Figure 2d; Appendix A, photos 21 and 22) flows west-east and perpendicular to the proposed Reliever Route. The river is following a natural meander and un-channelized within the project boundaries. During the site visit, it was approximately 60 feet wide (60 to 100 feet) and ranged from four inches deep to three feet in deeper pools.
- Willow Creek (Figures 2e, 2f, and 2g; Appendix A, photos 23 to 27) flows east to west and perpendicular to the proposed Reliever Route, parallel to US 50 just south of their



- a proposed interchange. Willow Creek is a natural drainage that has been channelized east of Lamar with several foot deep embankments in places, and retains little of its natural characteristics.
- Markham Arroyo (Figures 2b and 2c; Appendix A, photos 10 to 13) flows north-south and perpendicular to the proposed Reliever Route. The arroyo is following its natural course within adjacent agricultural fields.
- Larger canals and ditches, all constructed features that flow at the discretion of the canal/ditch owner(s)
 - Lamar Canal (Figures 2f and 2g; Appendix A, photos 28 and 29) is the longest water feature within the project boundaries, located at the proposed interchange and crossed in two areas.
 - Vista Del Rio Ditch (Figures 2a, 2b, and 2c; Appendix A, photos 7, 8, and 16) runs south of and parallel to the northern east-west portion of the Reliever Route. The surveyed project boundaries crossed this water feature in two locations.
 - Amity Canal (Figure 2b; Appendix A, photos 3 to 6) runs northeast-southwest along northern-most portion of proposed Reliever Route.
 - Hyde Canal (Figures 2c and 2d; Appendix A, photo 17) runs east-west and perpendicular to proposed Reliever Route. Hyde Canal is approximately 1,000 feet north of the Arkansas River riparian corridor in the study area.
 - Fort Bent Canal (Figure 2g) runs east-west and perpendicular to proposed Reliever Route, and parallel to County Road 8.5. This canal was the southern-most water feature within the surveyed project boundaries.
- Smaller unnamed ditches with wetlands and/or open water present, all constructed features that flow at the discretion of the canal/ditch owner(s)
 - Unnamed ditch north of Arkansas River (Figure 2a and 2b; Appendix A, photo 2) runs eastwest with a 90 degree turn to run north-south immediately south of State Highway 50 at western-most portion of project boundary.
 - Unnamed ditch north of Willow Creek (Figure 2e) runs east-west, north of Willow Creek, and parallel to County Road HH.5.

Ponded areas

- o Pond west of Speculator Ave (Figure 2a; Appendix A, photo 9) is north of the Arkansas River within an industrial complex, adjacent to a riparian zone. This pond is in a depression area with groundwater the most likely source of water.
- o Pond north of Arkansas River (Figure 2d; Appendix A, photos 18 to 20) is within a relatively undisturbed area north of Arkansas riparian zone. This pond is in a depression area that appears to receive water from a buried pipe.



 Pond #1 and Pond #2 (Figure 2c; Appendix A, photo 14) is between SH 196 and the Vista Del Rio Ditch. The water source for these ponds was not readily apparent.

Meadow wetland areas

Open meadow (Figure 2c; Appendix A, photo 15) is located between Pond #1 and Pond #2 and the Vista Del Rio Ditch. This area appeared to be subirrigated from underground water sources upgradient, possibly Ponds #1 and #2. The area is within a livestock pasture and the vegetation was heavily grazed.

3.2.2 Wetlands

Sixteen wetland areas were identified within the study area which consists of a 300-foot wide swath along the proposed alignment (Figures 2a-2g). The wetland areas were in some cases grouped based on proximity, hydrological source, and similarity of plant communities. Wetlands were delineated at the Arkansas River, Willow Creek, Markham Arroyo, Lamar Canal, Vista Del Rio Ditch, Amity Canal, Hyde Canal, the unnamed ditch north of Arkansas River, the three unnamed ponded areas, and the open meadow north of Vista Del Rio Ditch. No wetlands were observed at Fort Bent Canal, which was dry at the time of the survey, or the unnamed ditch north of Willow Creek. Wetland Determination Data Forms are in Appendix B in numeric order for the Sample Points (SP-I through SP-28) associated with the 16 wetlands. The following Sections discuss each wetland.

3.2.3 Wetland I

Wetland I (WL-I) was a Palustrine Emergent (PEM) wetland dominanted by the hydrophytic plant scratchgrass (*Muhlenbergia asperifolia*) along the Vista Del Rio Ditch, which is the suspected hydraulic source for this wetland. A PEM wetland is a wetland dominated by herbaceous vegetation. WL-I emerged near the water's edge along what appeared to be a remnant of Vista Del Rio Ditch at the western portion of the project area (Unnamed ditch north of Arkansas River; Figure 2a; Appendix A, photo 2). The hydric soil indicator was a depleted matrix (95% of Matrix at 0-12" 10YR 4/2, 5% Redox Features 7.5YR 5/5 C/M: Munsell 1994). Hydrology indicators included observation that the water table was present at approximately six inches below ground surface (bgs); and saturated soils were observed at a depth of two inches bgs within the soil pit. Sampling Point-24 was completed in this wetland.

3.2.4 Wetland 2

Wetland 2 (WL-2) was a PEM fringe wetland along a lateral ditch, the suspected hydraulic source for this wetland, that flows off of the remnant of Vista Del Rio Ditch at the western portion of the project area (Unnamed ditch north of Arkansas River; Figure 2a). The dominant hydrophytic plant was scratchgrass. This wetland appeared to be hydraulically connected to WL-1, and shared a similar plant community, hydrology and hydric soils.

3.2.5 Wetland 3

Wetland 3 (WL-3) was a Palustrine Shrub-Scrub (PSS) wetland dominated by sandbar willow with an understory of barnyard grass (*Echinochloa crus-galli*). A PSS wetland is a wetland dominated by shrubs and other woody plants. This wetland was located along Amity Canal, which is the suspected hydraulic source for this wetland, at the northwestern portion of the project area (Figure 2b; Appendix A, photo 3). The hydric soil indicator was sandy redox (40% of Matrix at 0-7" 10YR 6/2 and 45% 10YR 4/1, 10% Redox Features 10YR 6/1 D/M and 5% 10YR 4/6 C/M; 70% of Matrix at 7-16" 10YR 6/2, 30% Redox



Features 7.5YR 5/8: Munsell 1994). Indicators of wetland hydrology were surface-soil cracks, geomorphic position, and the FAC-neutral test. Sampling Point-21 was completed in this wetland.

3.2.6 Wetland 4

Wetland 4 (WL-4) was a PEM wetland along Amity Canal, which is the suspected hydraulic source for this wetland, at the northwestern portion of the project area (Figure 2b; Appendix A, photos 4 to 6). Dominant hydrophytic plants were barnyard grass and veiny dock (*Rumex venosus*). The hydric soil indicator was sandy redox (40% of Matrix at 0-7" 10YR 6/2 and 45% 10YR 4/1, 10% Redox Features 10YR 6/1 D/M and 5% 10YR 4/6 C/M; 70% of Matrix at 7-16" 10YR 6/2, 30% Redox Features 7.5YR 5/8: Munsell 1994). Indicators of wetland hydrology were sediment deposits, sparsely vegetated concave surface, geomorphic position, and the FAC-neutral test. Sampling Point-19 was completed in this wetland.

3.2.7 Wetland 5

Wetland 5 (WL-5) was a PEM wetland along the Vista Del Rio Ditch, which is the suspected hydraulic source for this wetland, where it crosses under US 287, just north of the Town of Lamar (Figure 2b; Appendix A, photo 7 and 8). Dominant hydrophytic plants were common threesquare (*Schoenoplectus pungens*) and narrowleaf cattail (*Typha angustifolia*). The hydric soil indicator was depleted matrix (80% of Matrix at 0-16" 10YR 3/2, 20% Redox Features 7.5YR 5/6 C/M, PL: Munsell 1994). Indicators of wetland hydrology were oxidized rhizospheres on living roots, saturation visible on aerial imagery, geomorphic position, and the FAC-neutral test. Sampling Point-22 was completed in this wetland.

3.2.8 Wetland 6

Wetland 6 (WL-6) was a PEM wetland along an unnamed pond, which is the suspected hydraulic source for this wetland, north of Lamar just to the east of Speculator Avenue (Pond west of Speculator Ave; Figure 2a; Appendix A, photo 9). Dominant hydrophytic plants were hardstem bullrush (*Schoenoplectus acutus*) and narrowleaf cattail. The hydric soil indicator was depleted matrix (90% of Matrix at 0-16" 10YR 5/1, 8% Redox Features 7.5YR 5/6 and 2% 10YR 2/1: Munsell 1994). Indicators of wetland hydrology were saturation, water-stained leaves, dry-season water table, saturation visible on aerial imagery, geomorphic position, and the FAC-neutral test (Munsell, 1994). Indicators of wetland hydrology included observation of saturation present at one inch bgs, and the water table was present at four inches bgs. Sampling Point-27 was completed in this wetland.

3.2.9 Wetland 7

Wetland 7 (WL-7) was a PEM wetland, present as a small shelf within Markham Arroyo, which is the suspected hydraulic source for this wetland, in the northern portion of the study area (Figure 2b; Appendix A, photos 10 to 13). Dominant hydrophytic plants were curly dock (*Rumex crispus*), annual rabbits foot grass (*Polypogon monspeliensis*), and lambsquarters (*Chenopodium album*). The hydric soil indicator was a depleted matrix (90% of Matrix at 0-9" 10YR 5/1, 2% Redox Features 10YR 5/1 D/M and 8% 10YR 5/8 C/M and 90% of Matrix at 9-16" 10YR 6/3, 10% Redox Features 10YR 5/8 C/M: Munsell 1994). Indicators of wetland hydrology included sediment deposits, water-stained leaves, oxidized rhizospheres on living roots, drainage patterns, and geomorphic position (Munsell, 1994). Indicators of wetland hydrology included soil saturation at depths ranging from three inches bgs to saturated at the surface, and the water table was present at six inches bgs. Sampling Points-8 (north) and -10 (south) were completed in this wetland (Figure 2b).



3.2.10 Wetland 8

Wetland 8 (WL-8) was a PEM wetland surrounding a series of small ponds, which is the suspected hydraulic source for this wetland, just north of Vista Del Rio Ditch (Pond #1 and Pond #2; Figure 2c; Appendix A, photo 14). Dominant hydrophytic plants were alkali sacaton (*Sporobolus airoides*), and inland saltgrass (*Distichlis spicata*). The indicators of wetland hydrology were salt crust and sparsely-vegetated concave surface.

3.2.11 Wetland 9

Wetland 9 (WL-9) was a PEM wetland on a slope hydraulically downgradient from the two small ponds associated with WL-8, and upgradient of Vista Del Rio Ditch (Open meadow; Figure 2c; Appendix A, photo 15). This area was a transitional area and appeared to receive groundwater from hydraulically upgradient, source unkown. The dominant hydrophytic plant was inland saltgrass. The hydric soil indicator was depleted matrix (95% of Matrix at 0-16" 10YR 4/2, 5% Redox Features 7.5YR 4/4 C/PL: Munsell 1994). Indicators of wetland hydrology were oxidized rhizospheres on living roots, saturation visible on aerial imagery, and FAC-neutral test. Sampling Point-17 and duplicate SP-17a were completed in this wetland.

3.2.12 Wetland 10

Wetland 10 (WL-10) was a PEM wetland in the channel of Vista Del Rio Ditch, which appeared to be a relic ditch and the suspected hydraulic source for this wetland (Figure 2c; Appendix A, photo 16). The ditch appeared to be a swale feature and was approximately 18-feet wide. Dominant hydrophytic plants were common threesquare (*Schoenoplectus pungens*), alkali sacaton, and inland saltgrass. The hydric soil indicator for the sampling point was depleted matrix (90% of Matrix at 0-7" 10YR 4/1, 10% Redox Features 7.5YR 4/6 C/M PL and 30% of Matrix at 7-16" 10YR 4/1, 70% Redox Features 7.5YR 4/6 C/M: Munsell 1994). Indicators of wetland hydrology were salt crust, oxidized rhizospheres on living roots, sparsely vegetated concave surface, saturation visible on aerial imagery, geomorphic position, and FAC-neutral test. Sampling Point-16 was completed in this wetland.

3.2.13 Wetland 11

Wetland II (WL-II) was a PEM wetland, occupying a two-foot-wide fringe on a narrow bank along Hyde Canal, which is the suspected hydraulic source for this wetland (Figures 2c and 2d; Appendix A, photo 17). Dominant hydrophytic plants were common threesquare, alkali sacaton and annual rabbits foot grass. The hydric soil indicator was depleted matrix (70% of Matrix at 0-12" 10YR 5/6, 20% Redox Features 10YR 5/6 C/M and 10% gley2 3/10BG C/M: Munsell 1994). Indicators of wetland hydrology were drainage patterns, geomorphic position, and FAC-neutral test. The soil was saturated at the surface at both sampling points, and the water table was between six and seven inches bgs. Sampling Points-12 (east) and -14 (west) were completed in this wetland.

3.2.14 Wetland 12

Wetland 12 (WL-12) was a Palustrine Unconsolidated Bottom (PUB) wetland. A PUB is a plaustrine wetland where Unconsolidated Bottom includes all wetland and deepwater habitats with at least 25% cover of particles smaller than stones, and a vegetative cover less than 30%. The PUB was surrounding the pond north of the Arkansas River, which is the suspected hydraulic source for this wetland (Figure 2d; Appendix A, photos 18 to 20). The dominant hydrophytic plants were common reed (*Phragmites australis*), and narrowleaf cattail. Sandbar willows were also present at 20% coverage. The hydric soil



indicator was sandy redox (98% of Matrix at 0-4" 10YR 4/2, 2% Redox Features 10YR 5/8 C/PL and 90% of Matrix at 4-10" 10YR 5/2, 10% Redox Features 10YR 5/8 C/PL M and 80% of Matrix at 10-12" 10YR 4/1, 20% Redox Features 5YR 4/6 C/M: Munsell 1994). Indicators of wetland hydrology were the presence of the water table at approximately 20 inches bgs, and the soil was saturated at the surface. Sampling Point-4 was completed in this wetland.

3.2.15 Wetland 13

The wetlands identified along the Arkansas River are collectively referred to as Wetland 13 (WL-13; Figure 2d; Appendix A, photos 21 and 22). These wetlands were primarily located within the banks of the river, which is the hydraulic source for these wetlands, and on small fringes and vegetated sandbars, and are classified as Riverine Upper Perennial Unconsolidated Bottom (R3UB). In general, Riverine Upper Perennial is a river system where some water flows throughout the year and the substrate consists of rock, cobbles, or gravel with occasional patches of sand.

Dominant herbaceous species included witchgrass (*Panicum capillare*), foxtail barley (*Hordeum jubatum*), common reed, yellow nutsedge (*Cyperus esculentus*), arctic rush (*Juncus arcticus*), and marsh meadow foxtail (*Alopecurus ventricosus*). Tamarisk and plains cottonwood (*Populus deltoides*) saplings were present in the shrub layer at coverage of 40 percent and one percent, respectively. A thin layer of muck (one centimeter) was present at the top of the soil profile. A hydrogen sulfide odor was also present. Both of these features are indicators of hydric soils (100% of Matrix at 0-0.5" 5Y 4/3, and 100% of Matrix at 0.5-7.5" 10YR 5/4, and 100% of Matrix at 7.5-9.5" gley I 2.5Y/N, and 100% of Matrix at 9.5-18" 10YR 5/4: Munsell 1994). Indicators of wetland hydrology were the presence of the water table at approximately 4 inches bgs, the soil was saturated at the surface, hydrogen sulfide odor, thin muck surface, and geomorphic position. Sampling Point-3 was completed in this wetland.

3.2.16 Wetland 14

The wetland identified within Willow Creek, which is the suspected hydraulic source for this wetland, Wetland 14 (WL-14), was a fringe PSS wetland that range in width from one foot to 20 feet (Figure 2e; Appendix A, photo 23). The PSS portion of the wetland along Willow Creek was dominated by sandbar willow with an understory of scratchgrass and curly dock. Hydric soil indicators included a depleted matrix (80% of Matrix at 0-16" 10YR 4/1, 20% Redox Features 10YR 5/8 C/M: Munsell 1994). Indicators of wetland hydrology were drift deposits, saturation visible on aerial imagery, saturation at approximately 6 inches bgs, geomorphic position, and FAC-neutral test. Sampling Point-28 was completed in this wetland.

3.2.17 Wetland 15

Wetland 15 (WL-15) was a fringe PEM wetland along Willow Creek, which is the suspected hydraulic source for this wetland, and range in width from one foot to 20 feet. Dominant vegetation included barnyard grass, and narrowleaf cattail (Willow Creek; Figures 2e and 2f; Appendix A, photos 25 to 27). The dominant vegetation was barnyard grass or cattails, with some areas dominated by one and other areas dominated by the other, depending on degree and persistence of saturation. Watercress (Nasturtium officinale) was also present. Hydric soil indicators included a depleted matrix, and indicators of wetland hydrology included drift deposits, algal mat or curst, and geomorphic position (70% of Matrix at 0-16" 10YR 4/1, 30% Redox Features 10YR 5/8 C/M: Munsell 1994). Indicators of wetland hydrology included the water table present at approximately 8 inches, and soil saturation at the surface. Sampling Point-6 was completed in this wetland.



3.2.18 Wetland 16

The wetlands associated with Lamar Canal, Wetland 16 (WL-16), were fringe PEM wetlands that occurred intermittently along the north bank of the canal (Figure 2f and 2g; Appendix A, photos 28 and 29). The width of the fringe ranged from 10 feet to 20 feet, and composed entirely by narrowleaf cattails. Lamar Canal is the suspected hydraulic source for these wetlands. The hydric soil indicator was sandy redox (90% of Matrix at 0-3" 10YR 5/2, 10% Redox Features 7.5YR 3/4 C/PL and 45% of Matrix at 3-18" 10YR 4/2 and 45% 10YR 4/3, 10% Redox Features 7.5YR 3/4 C/M: Munsell 1994). Indicators of wetland hydrology included inundation visible on aerial imagery, water-stained leaves, salt crust, aquatic invertebrates, surface soil cracks, and geomorphic position. Sampling Point-1 was completed in this wetland.

3.3 FACWet

The AOI included a large area to the east of Lamar, Colorado, where the planned US 287 Reliever Route will be constructed (Figure I). Sixteen wetland areas (WL-I to WL-I6) were defined within the AOI as detailed in Section 3.2. For the purpose of analyzing the functional capacity of the wetlands per CDOT's FACWet methodology, the wetland areas are grouped into Assessment Areas (AAs). AAs are typically based on hydrogeomorphic class, wetland type, and location within the AOI. In addition, canals and ditches were considered anthropogenic features; therefore, the geomorphology was considered not natural and the score was therefore downgraded on these water bodies.

In this project, the AAs analysis resulted in the same number, size and locations as the wetlands. Therefore, AA-I to AA-I6 locations are synonymous with WL-I to WL-I6 locations in Figure 2. Table I provides a summary of the AAs. FACWet Data Forms for AA-I to AA-I6 are included in Appendix C in numerical order. FACWet scores were determined and recorded as Functional Capacity Indices (FCI). FCI score values are interpreted as follows:

FCI Score	Functional Category	Interpretation
1.0 - 0.9	Reference Standard	AA is functioning at or near its Reference Standard capacity.
<0.9 - 0.8	Highly Functioning	AA retains all of its natural functions. While the capacity of some or all have been altered somewhat, the function of the wetland is still fundamentally sound.
<0.8 - 0.7	Functioning	The capacity of some or all of the AAs functions has been markedly altered, but the wetland still provides the types of functions associated with its habitat type.
<0.7 - 0.6	Functioning Impaired	The functioning of the wetland has been severely altered. Certain functions may be nearly extinguished or they may be grossly altered to be more representative of a different class of wetland (e.g., a fen converted to a depressional system). Despite the profound changes, the AA still supports wetland habitat.



< 0.6

Non-functioning

AA no longer possesses the basic criteria necessary to support wetland conditions.

Table I. List of Wetland Assessment Areas at US 287 Lamar Reliever Route

Assessment Area	Associated Wetland	Overall FCI	Associated Water Feature	Wetland Type*	
AA-I	WL-I	0.70	Vista Del Rio Ditch	PEM	
AA-2	WL-2	0.68	Vista Del Rio Ditch	PEM	
AA-3	WL-3	0.66	Amity Canal	PSS	
AA-4	WL-4	0.68	Amity Canal	PEM	
AA-5	WL-5	0.66	Vista Del Rio Ditch	PEM	
AA-6	WL-6	0.69	isolated pond	PEM	
AA-7	WL-7	0.69	Markham Arroyo	PEM	
AA-8	WL-8	0.74	Vista Del Rio Ditch	PEM	
AA-9	WL-9	0.74	Vista Del Rio Ditch	PEM	
AA-10	WL-10	0.73	Vista Del Rio Ditch	PEM	
AA-11	WL-II	0.73	Hyde Canal	PEM	
AA-12	WL-12	0.70	isolated pond	PUB	
AA-13	WL-13	0.85	Arkansas River	R3UB	
AA-14	WL-14	0.66	Willow Creek	PSS	
AA-15	WL-15	0.66	Willow Creek	PEM	
AA-16	WL-16	0.66	Lamar Canal	PEM	

^{*} Cowardin, et. al., 1979.

3.3.1 Assessment Area I

Assessment Area I (AA-I) was comprised of WL-I, the wetland along a remnant of Vista Del Rio Ditch. The overall FACWet Functional Capacity Index (FCI) for the AA was 0.70, classifying it as "Functioning." The main causes (i.e. stressors) of the low score were agricultural development in the area, including



concentrated animal feeding operations (CAFOs), and the presence of the Town of Lamar. These stressors affected variables such as habitat connectivity and buffer capacity. The primary function of this AA is support of characteristic fish/aquatic habitat, flood attenuation, nutrient/toxicant removal, production export/food chain support and sediment retention.

3.3.2 Assessment Area 2

Assessment Area 2 (AA-2) was comprised of WL-2, which was the wetland along a lateral offshoot of the remnant of Vista Del Rio Ditch. The overall FCI for the AA was 0.68, classifying it as "Functioning Impaired." The main stressors causing this lower score were agricultural development in the area, including CAFOs, and the Town of Lamar. These stressors affected variables such as habitat connectivity, buffer capacity, chemical environment, and vegetation structure and complexity. The primary function of this AA is short- and long-term water storage, support of characteristic fish/aquatic habitat, flood attenuation, and nutrient/toxicant removal.

3.3.3 Assessment Area 3

Assessment Area 3 (AA-3) was comprised of WL-3, which was the PSS wetland alongside Amity Canal. The overall FCI for the AA was 0.66, classifying it as "Functioning Impaired." The main stressors causing the low score were agricultural development in the area, including CAFOs, and the Town of Lamar. These stressors affected variables such as habitat connectivity, buffer capacity, water distribution, and water outflow. The primary function of this AA is support of characteristic fish/aquatic habitat, support of wildlife habitat, and production export/food chain support.

3.3.4 Assessment Area 4

Assessment Area 4 (AA-4) was comprised of WL-4, which was the PEM wetland alongside Amity Canal. The overall FCI for the AA was 0.68, classifying it as "Functioning Impaired." The main stressors causing the low score were agricultural development in the area, including CAFOs, and the Town of Lamar. These stressors affected variables such as habitat connectivity, buffer capacity, water source, water distribution, and water outflow. The primary function of this AA is support of wildlife habitat, production export/food chain support and sediment retention.

3.3.5 Assessment Area 5

Assessment Area 5 (AA-5) was comprised of WL-5, which was the wetland associated with the remnant Vista Del Rio Ditch. The overall FCI for the AA was 0.66, classifying it as "Functioning Impaired." The main stressors were agricultural development in the area, including CAFOs, and the Town of Lamar. These stressors affected variables such as habitat connectivity, buffer capacity, water source, water distribution, and water outflow. The primary function of this AA is support of wildlife habitat, production export/food chain support and sediment retention.

3.3.6 Assessment Area 6

Assessment Area 6 (AA-6) was comprised of WL-6, which was the wetland associated with a small pond north of the Town of Lamar. The overall FCI for the AA was 0.69, classifying it as "Functioning Impaired." The main stressors were agricultural development in the area, including CAFOs, and the Town of Lamar. These stressors affected variables such as buffer capacity, water outflow, and geomorphology. The primary function of this AA is support of characteristic fish/aquatic habitat, nutrient/toxicant removal, and support of wildlife habitat.



3.3.7 Assessment Area 7

Assessment Area 7 (AA-7) was comprised of WL-7, which was the wetlands associated with Markham Arroyo, one of the natural drainage features in the project area. The overall FCI for the AA was 0.69, classifying it as "Functioning Impaired." The main stressors were the presence of road grades downstream disrupting the water outflow, livestock grazing, and agricultural development area-wide impacting the water source and water distribution, as well as the chemical environment. The primary function of this AA is nutrient/toxicant removal, support of wildlife habitat, and sediment retention.

3.3.8 Assessment Area 8

Assessment Area 8 (AA-8) was comprised of WL-8, which was the wetland associated with the series of ponds upgradient from the remnant Vista Del Rio Ditch. The overall FCI for the AA was 0.74, classifying it as "Functioning." The stressors affecting the wetland included agricultural development in the area and the presence of the Town of Lamar. These stressors affected variables such as habitat connectivity, buffer capacity, water source, water distribution, and water outflow. The primary function of this AA is support of wildlife habitat, production export/food chain support and sediment retention.

3.3.9 Assessment Area 9

Assessment Area 9 (AA-9) was comprised of WL-9, which was the slope wetland upgradient from the remnant Vista Del Rio Ditch. The overall FCI for the AA was 0.74, meaning that it was classified as "Functioning." Stressors included agricultural development in the area and the presence of the Town of Lamar. These stressors affected variables such as habitat connectivity, buffer capacity, water source, water distribution, and water outflow. The primary function of this AA is nutrient/toxicant removal, support of wildlife habitat, and sediment retention.

3.3.10 Assessment Area 10

Assessment Area 10 (AA-10) was comprised of WL-10, which was the wetland associated with the remnant Vista Del Rio Ditch itself. The overall FCI for the AA was 0.73, i.e., "Functioning." The stressors for this wetland included agricultural development in the area and the presence of the Town of Lamar. These stressors affected variables such as habitat connectivity, buffer capacity, water source, water distribution, and water outflow. The primary function of this AA is support of wildlife habitat, production export/food chain support and sediment retention.

3.3.11 Assessment Area 11

Assessment Area II (AA-II) was comprised of WL-II, which was the wetland associated with Hyde Canal. The overall FCI for the AA was 0.73, classifying it as "Functioning." The stressors affecting the wetland included agricultural development in the area and the presence of the Town of Lamar. These stressors affected variables such as water source, water distribution, water outflow, geomorphology, and the chemical environment. The primary function of this AA is support of wildlife habitat, production export/food chain support and sediment retention.

3.3.12 Assessment Area 12

Assessment Area 12 (AA-12) was comprised of WL-12, which was the wetland associated with a small pond that appeared to be fed by a pipe, to the north of the Arkansas River. The overall FCI for the AA was 0.70, classifying it as "Functioning." The stressors affecting the wetland included agricultural



development in the area and the presence of the Town of Lamar. These stressors affected variables such as habitat connectivity, water source, water distribution, and water outflow. Vegetation structure and complexity was affected by the presence of common reed, which is on the Colorado Noxious Weeds Watch List (CDOA, 2012). The primary function of this AA is support of characteristic fish/aquatic habitat, nutrient/toxicant removal, and support of wildlife habitat.

3.3.13 Assessment Area 13

Assessment Area 13 (AA-13) was comprised of WL-13, which was the wetlands associated with the Arkansas River, the largest natural feature in the study area. The overall FCI for the AA was 0.85, classifying it as "Highly Functioning." The main stressor affecting the FCI score was the presence of tamarisk, which is listed as a noxious weed on the Colorado Noxious Weeds Watch List (CDOA, 2012). The primary function of this AA is short- and long-term water storage, support of characteristic fish/aquatic habitat, and nutrient/toxicant removal.

3.3.14 Assessment Area 14

Assessment Area 14 (AA-14) was comprised of WL-14, which was the PSS wetland associated with Willow Creek. The overall FCI for the AA was 0.66, classifying it as "Functioning Impaired." The main stressors causing the lower score were the channelization of Willow Creek, agricultural development in the area, CAFOs, and the presence of the Town of Lamar. These stressors affected variables such as habitat connectivity, buffer capacity, water source, water distribution, water outflow, and geomorphology. The primary function of this AA is wildlife habitat, production export/food chain support and sediment retention.

3.3.15 Assessment Area 15

Assessment Area 15 (AA-15) was comprised of WL-15, which was the PEM wetland associated with Willow Creek. The overall FCI for the AA was 0.66, classifying it as "Functioning Impaired." The main stressors were the channelization of the natural drainage, agricultural development in the area, CAFOs, and the presence of the Town of Lamar. These stressors affected variables such as habitat connectivity, buffer capacity, water source, water distribution, water outflow, and geomorphology. The primary function of this AA is wildlife habitat, production export/food chain support and sediment retention.

3.3.16 Assessment Area 16

Assessment Area 16 (AA-16) was comprised of WL-16, which was the wetland associated with Lamar Canal. The overall FCI for the AA was 0.66, classifying it as "Functioning Impaired." The main stressors were agricultural development in the area, including CAFOs, and the presence of the Town of Lamar. These stressors affected variables such as habitat connectivity, buffer capacity, water source, water distribution, water outflow, and geomorphology. The primary function of this AA is wildlife habitat, production export/food chain support and sediment retention.



4. Impacts

4.1 Direct Impacts

Direct impacts to open water and wetlands could result from constructing the roadway and roadway infrastructure including bridges, box culverts, shoulders, and retaining walls. Shading from bridges was considered to permanently impact wetlands, but not open water. Open water and wetland direct permanent impact sources used for determination are identified in Table 2.

Table 2. Permanent Impact Source for Open Water and Wetlands at US 287 Lamar Reliever Route

Open Water Body	Wetland ID	Impact Source
Vista Del Rio Dtich	WL-I & WL-2	No impact – project will not disturb this area
Amity Canal	WL-3 & WL-4	No impact – Existing bridge would remain in place
Markham Arroyo	WL-7	Roadway crossing over arroyo with culvert (30' from edge of traveled way)
Pond #I	WL-8	Roadway and shoulder (proposed ROW minus 10 feet)
Pond #2	WL-8	Roadway and shoulder (proposed ROW minus 10 feet)
Open Meadow	WL-9	Roadway and shoulder (proposed ROW minus 10 feet)
Vista Del Rio Ditch (Culvert)	WL-10	Roadway crossing over ditch with culvert (Box culvert dimensions)
Hyde Canal (Culvert)	WL-11	Roadway crossing over canal with culvert (Box culvert dimensions)
Arkansas River	WL-13	Roadway crossing over river with bridge (proposed ROW minus 10 feet)
Willow Creek	WL-14	Roadway crossing over creek with bridge which will not disturb creek (proposed ultimate structure and box culvert dimensions)
Willow Creek	WL-15	Roadway crossing over creek with bridge which will not disturb creek (proposed ultimate structure and box culvert dimensions)
Lamar Canal	WL-16	Roadway crossing over canal with bridge which will not disturb creek (proposed ultimate structure and box culvert dimensions)
Lamar Canal (Culvert)	no wetland	Roadway crossing over canal with box culvert (proposed ultimate structure and box culvert dimensions)
Fort Bent Canal (Culvert)	no wetland	Roadway crossing over canal with box culvert (box culvert dimensions)
Unnamed Ditch N. of Willow Creek	no wetland	Roadway crossing over ditch with culvert (estimated from other box culverts)

Permanent impacts are presented for the Interim phase to build to two lanes and for the Ultimate phase to build to four lanes (Table 3, Figures 3 to 5). The Interim phase is calculated for both the north-bound lanes and the south-bound lanes, since which lanes will be built during the Interim phase has not been determined at the time of this report. The impacts have been reduced to less than 0.5 acre for each of the phases through use of retaining walls, most notably at the open meadow and Pond #1 and #2.



Construction of the Interim phase for the north-bound lanes would result in permanent impacts to a total of 0.433 acre of wetlands and 0.193 acre of open waters (Table 3; Figure 3). The south-bound Interim phase option would result in permanent impacts to a total of 0.466 acre of wetlands and 0.170 acre of open waters (Table 3; Figure 4). The Interim phase impacts take into account the area needed for two travel lanes, two 10-foot shoulders, and the adjacent ROW for cut and fill limits for the roadway. The ROW limits for both the northbound and southbound Interim alignments extend beyond the center line of the ultimate phase alignment. Therefore, there is some overlap in impacts between the northbound and southbound alignments, where their ROW limits overlap in the center of the Ultimate phase alignment. For this reason the northbound and southbound impact quantities do not add up to the Ultimate phase impact quantities. The Ultimate phase would result in permanent impacts to a total of 0.912 acre of wetlands and 0.379 acre of open waters (Table 3; Figure 5).

Table 3. Permanent Impact Amounts (acres) for Open Water and Wetlands at US 287 Lamar Reliever Route

On an Water Bady	Wetland	Northbound Route Impact (acres)		Southbound Route Impact (acres)		Ultimate Phase Impact (acres)	
Open Water Body	ID	Wetland	Open Water	Wetland	Open Water	Wetland	Open Water
Amity Canal*	WL-3 & WL-4	0	0	0	0	0	0
Markham Arroyo	WL-7	0.018	0.029	0.025	0.029	0.038	0.039
Pond #I	WL-8	0.035	0	0.116	0.025	0.116	0.025
Pond #2	WL-8	0.096	0.048	0	0	0.096	0.048
Open Meadow	WL-9	0.110	0	0.123	0	0.328	0
Vista Del Rio Ditch (Culvert)	WL-10	0.062	0.023	0.066	0.023	0.125	0.053
Hyde Canal (Culvert)	WL-II	0.004	0.023	0.003	0.023	0.007	0.053
Arkansas River	WL-13	0.016	0	0.014	0	0.030	0
Willow Creek (bridge)	WL-14	0.052	0	0.101	0	0.123	0
Willow Creek (bridge)	WL-15	0.036	0	0.014	0	0.041	0
Lamar Canal (bridge)	WL-16	0.004	0	0.004	0	0.008	0
Lamar Canal (Culvert)	no wetland	0	0.024	0	0.024	0	0.055
Fort Bent Canal (Culvert)	no wetland	0	0.023	0	0.023	0	0.053
Unnamed Ditch North of Willow Creek	no wetland	0	0.023	0	0.023	0	0.053
Total		0.433	0.193	0.466	0.170	0.912	0.379

^{*} existing bridge would remain in place



Temporary wetland impacts will result from construction activities (Table 4). Temporary wetland impacts will occur as a result of ground disturbance needed to prepare the road base, installation of culverts, bridge piers, and general construction access.

Table 4. Temporary Impact Source for Open Water and Wetlands at US 287 Lamar Reliever Route

Open Water Body	Wetland ID	Impact Source
Vista Del Rio Dtich	WL-I & WL-2	No impact – project will not disturb this area
Amity Canal	WL-3 & WL-4	No impact – Existing bridge would remain in place
Markham Arroyo	WL-7	Installation of culvert - estimated from culvert (30' from edge of traveled way)
Pond #I	WL-8	Installation of roadway - area between limit of proposed ROW and 10 feet buffer used in determining perm impacts
Pond #2	WL-8	Installation of roadway - area between limit of proposed ROW and 10 feet buffer used in determining perm impacts
Open Meadow	WL-9	Installation of roadway - area between limit of proposed ROW and 10 feet buffer used in determining perm impacts
Vista Del Rio Ditch (Culvert)	WL-10	Temporary occupation for construction purposes
Hyde Canal (Culvert)	WL-II	Temporary occupation for construction purposes
Arkansas River	WL-13	Bridge footprint
Willow Creek	WL-14	Temporary occupation for construction purposes
Willow Creek	WL-15	Temporary occupation for construction purposes
Lamar Canal	WL-16	Temporary occupation for construction purposes
Lamar Canal (Culvert)	no wetland	Temporary occupation for construction purposes
Fort Bent Canal (Culvert)	no wetland	Temporary occupation for construction purposes
Unnamed Ditch N. of Willow Creek	no wetland	Estimated from other box culverts

Construction of the Interim phase for the north-bound lanes would result in temporary impacts to a total of 0.227 acre of wetlands and 0.106 acre of open waters (Table 5). The south-bound Interim phase option would result in temporary impacts to a total of 0.210 acre of wetlands and 0.081 acre of open waters. The Ultimate phase would result in temporary impacts to a total of 0.261 acre of wetlands and 0.121 acre of open waters.



Table 5. Temporary Impact Amounts (acres) for Open Water and Wetlands at US 287 Lamar Reliever Route

Open Water Body	Wetland	Northbound Route Impact (acres)		Southbound Route Impact (acres)		Ultimate Impact (acres)	
Open Water Body	ID	Wetland	Open Water	Wetland	Open Water	Wetland	Open Water
Amity Canal	WL-3 & WL-4	0	0	0	0	0	0
Markham Arroyo	WL-7	0.008	0.011	0.007	0.011	0.001	0.011
Pond #I	WL-8	0.010	0	0	0	0*	0
Pond #2	WL-8	0.012	0.014	0	0	0.014	0.014
Open Meadow	WL-9	0.081	0	0.083	0	0.059	0
Vista Del Rio Ditch (Culvert)	WL-10	0.026	0.011	0.025	0.011	0.004	0.011
Hyde Canal (Culvert)	WL-11	0.004	0.011	0.003	0.011	0.004	0.011
Arkansas River	WL-13	0.010	0.026	0.005	0.015	0.015	0.041
Willow Creek	WL-14	0.040	0	0.065	0	0.119	0
Willow Creek	WL-15	0.033	0	0.012	0	0.036	0
Lamar Canal	WL-16	0.003	0	0.010	0	0.009	0
Lamar Canal (Culvert)	no wetland	0	0.011	0	0.011	0	0.011
Fort Bent Canal (Culvert)	no wetland	0	0.011	0	0.011	0	0.011
Unnamed Ditch North of Willow Creek	no wetland	0	0.011	0	0.011	0	0.011
Total		0.227	0.106	0.210	0.081	0.261	0.121

^{*} Pond #I is entirely within the Northbound Route and would be permanently impacted by construction of the Northbound Route first with no additional impact during the Ultimate Phase construction. If the Southbound Phase is constructed first, then the Ultimate Phase construction would impact the entire pond.

4.2 Indirect Impacts

This project is not expected to result in above normal indirect impacts as compared to comparable roadways. In general, indirect impacts to wetlands caused by roadways can include increase in stormwater runoff with a resultant increase in water level fluctuation and may result in greater inputs of sediment, nutrients, chlorides, and other pollutants and may increase erosion. An increase in noxious weeds could occur due to habitat disturbance during construction and as a result of weed seeds being carried by vehicles using the new highway. Water quality practices as planned for this roadway would greatly reduce these factors. The following water quality mitigation commitments will be implemented:



- CDOT will design bridge features to provide maximum water quality protection, including size and location of piers and abutments, and will design bridge features to minimize scour. These mitigation features will be designed to minimize impact on aquatic habitat.
- CDOT will treat stormwater runoff from bridge decks using Best Management Practices (BMPs) prior to discharging to adjacent water bodies.
- The contractor will follow CDOT's Specification for Road and Bridge Construction to implement temporary and permanent water quality BMPs.
- During final design, CDOT will develop permanent water quality BMPs such as detention ponds
 or swales to treat runoff before entering surface waters or wetlands, consistent with the
 guidelines set by the CDOT New Development and Redevelopment Program. These features
 will be constructed concurrent with the Proposed Action.



5. Mitigation

Unavoidable impacts to wetlands and open waters will be compensated in-kind with on-site mitigation for temporary impacts and for permanent impacts to the extent practicable. CDOT policy requires that all wetlands, both jurisdictional and non-jurisdictional, be mitigated for disturbance at a ratio of I:I. All temporarily impacted wetlands will be restored in-place.

Both USACE and CDOT typically require mitigation for permanent impacts at a ratio of I:I. Mitigation for wetland impacts greater than 0.10 acre is required by USACE; CDOT mitigates all permanent and temporary wetland impacts; therefore, all impacts to wetlands will require mitigation for this project. Mitigation may take place onsite or through the use of wetland mitigation bank credits through the CDOT Limon Wetland Mitigation Bank (wetland bank) in Lincoln County. Currently, the wetland bank has approximately six acres left of credit. However, a recent field visit has led to concerns that the wetland bank may not be viable. Therefore, this wetland bank may or may not be available for use when this project goes to construction.

The Arkansas River, Markham Arroyo, and hydraulically connected canals and ditches are most likely under the jurisdiction of USACE. However, some of the minor irrigation ditches and canals and the isolated ponds may not be regulated by USACE. This determination can only be officially made by the USACE. The wetlands associated with non-jurisdictional Waters of the US, would also not be jurisdictional.

It is anticipated that multiple Nationwide Permits can be used for this project rather than an Individual Permit for Section 404 of the Clean Water Act, as long as impacts at each wetland/US waters location is less than 0.5 acre. In both the interim and ultimate phases, retaining walls will be constructed at or near the edge of the proposed shoulder of the project in the Open Meadow area (WL-9) to reduce the project's impact to this specific wetland. During final design, CDOT will consider additional construction measures, such as steepening side slopes or constructing additional retaining walls, to potentially further reduce impacts to other existing wetlands and open waters. CDOT will coordinate with USACE as project specific plans are available. However, CDOT requires mitigation for disturbance of all wetlands therefore jurisdictional status will not affect wetland mitigation as presented in this report.

During final design this Wetland Finding report will be updated with actual wetland impacts and a site-specific mitigation plan will be developed and implemented during construction. If actual wetland impacts exceed the stated amounts, then the contractor would be responsible for any subsequent modification of USACE permitting requirements

All temporary open water and temporary wetland impacts will be mitigated in place. Indirect impacts will be minimized by the implementation of a Stormwater Management Plan (SWMP) and construction BMPs. A Noxious Weed Management Plan will be developed to minimize indirect impacts to wetlands due to weeds by re-seeding with native species where ground disturbance occurs.

5.1 Wetland Mitigation Options

Wetland mitigation for permanent impacts will occur onsite where possible, although teaming with another agency or private entity for offsite mitigation may also be considered. For example, CDOT and Colorado Parks and Wildlife have had preliminary discussion about partnering to reclaim the gravel ponds located just east of US 287 as it crosses the Arkansas River. When onsite or offsite mitigation is



not feasible, the wetland bank could be used. Potential mitigation locations for each wetland are presented below.

5.1.1 Undisturbed Wetlands = WL-1, WL-2, WL-3, WL-4

No disturbance of wetlands in WL-1, WL- 2, WL-3, or WL-4 is planned; therefore, mitigation is not required.

5.1.2 Canal and Ditch Wetlands = WL-7, WL-10, WL-11, WL-14, WL-15, WL-16

The canal and ditch wetlands are fringe PEM wetlands that occur intermittently along the waterways. WL-15 also has some PSS wetland. Where feasible hydraulically, permanent impacts will be mitigated through development of new wetlands in areas along these ditches and canals where wetlands currently do not occur. These may be developed concurrent with and using similar methods to temporary impact wetland replacement. These could be located within the ROW of the Reliever Route where no future development will occur. Most likely not enough acreage will be available to mitigate for all permanent impacts. Use of the wetland bank may be considered as well as offsite mitigation. Onsite mitigation may not be possible along the Fort Bent and Hyde Canals as these resources have been identified as potentially eligible for listing on the National Register of Historic Properties.

5.1.3 Pond Wetlands = WL-8

WL-8 could be mitigated at the gravel ponds located east of current US 287 as it crosses the Arkansas River if CDOT and Colorado Parks and Wildlife can work collaboratively to reclaim these ponds. The wetland bank could also be used.

5.1.4 Open Meadow Wetland = WL-9

The open meadow wetland is a PEM wetland that could be mitigated through use of the wetland bank.

5.1.5 Riverine Wetland = WL-13

Wetlands along the river are intermittent and, as with the canals and ditches, where feasible hydraulically, permanent impacts could be mitigated through development of new wetlands in areas along the river where wetlands currently do not occur. Mostly likely not enough acreage will be available to mitigate for all permanent impacts and some wetland bank purchase with the wetland bank will be required.

5.2 Wetland Mitigation Monitoring

Monitoring and documenting the success of mitigation efforts is an integral part of the mitigation process. As mitigation sites are finalized, mitigation plans and formal monitoring program will be developed.

5.3 Best Management Practices

Avoidance and minimization of impacts were addressed during the site plan development via the advanced identification of wetlands and open waters in all areas in which impacts are proposed. An initial natural resources inventory and evaluation of all wetlands areas were completed to provide a basis



for planning to avoid impacts to wetlands. During the refinement of design plans this identification provided the opportunity for avoidance and minimization of wetlands and open waters and ensured compliance with the Section 404(b)(1) "best management practices" guidance of the Clean Water Act, which provides for the structural and non-structural methods, measures or practices implemented to prevent, reduce or mitigate adverse water quality impacts resulting from construction and operation of a project.

CDOT will implement the following BMPs, as appropriate, in order to limit temporary project impacts to wetlands and other aquatic systems:

- Construction staging, including construction and waste material, fill material, equipment, fuel, etc. areas shall be located outside of the area adjacent to streams, including wetlands and riparian areas. At a minimum, such staging areas and materials shall not be located within 15 meters (50 horizontal feet) of the ordinary high water mark of any watercourse.
- Equipment refueling and servicing shall occur only within approved designated areas.
- All construction equipment shall be maintained in good working order to avoid unnecessary discharge of harmful materials used in the operation of that equipment, including petroleum products, radiator fluid, hydraulic fluid, etc.
- All practicable efforts shall be expended to avoid and minimize in-stream work. Where practical, equipment shall be operated from banks or shoulders above riparian and wetland areas. In those instances where in-stream work is required, such work shall be performed during low flows, and the use of heavy equipment in streambeds, especially in live or flowing water, shall be minimized. The equipment used shall be of such a type that will produce minimal environmental damage, including damage to the stream bottom.
- All reasonable measures shall be taken to avoid excess application and introduction of chemicals into aquatic ecosystems and adjacent riparian areas, including wetlands. The use of chemicals such as soil stabilizers, dust palliatives, herbicides, sterilants, growth inhibitors, fertilizers, deicing salts, etc., during construction and maintenance operations shall be in accordance with the manufacturer's recommended application rates, frequency, and instructions. These chemicals shall not be used, stored, or stockpiled within 15 meters (50 horizontal feet) of the ordinary high water mark of any state waters, including wetlands, except when otherwise specified in the project contract.
- Geotextile fabric shall be placed over temporarily impacted wetland areas located within work areas. The fabric shall be covered with straw and topsoil for the duration of the work and then removed.
- Temporary fencing (orange) shall be installed in areas outside the projects limit of disturbance but which require additional protection from encroachment of personnel and equipment, such as wetlands, streams, etc.



- Silt fence, erosion logs, or similar erosion control products shall be installed wherever the toe of fill meets the water's edge, riparian areas, and wetlands in the work area. Temporary and permanent erosion and sediment control measures shall be installed at the earliest practicable time consistent with good construction practices. Such measures shall be properly monitored and maintained throughout the operation of the project.
- Washing of trucks or equipment, or concrete saw water will be allowed in aquatic ecosystems and riparian areas, including wetlands. Concrete washout areas shall occur only within approved designated areas.
- The stream channel bottom shall be returned to the elevation and configuration existing prior to construction. Work in live water systems shall be conducted in accordance with all applicable permits and contract conditions.
- Riprap above the ordinary high water line shall be covered with topsoil and revegetated as specified by the CDOT landscape architect. Areas under bridges do not need topsoil treatment. Where appropriate, streamside areas at the ordinary high water line should be revegetated with brush layer cuttings of native riparian shrub species.
- All practicable measures shall be taken to avoid disturbance to existing vegetation. The length of time that disturbed areas are left exposed shall be as short as practicable and the extent of such disturbed areas shall be as small as practicable. Particular attention shall be paid to protecting aquatic ecosystems, riparian areas, wetlands, and habitats for threatened and endangered species from such impacts and unnecessary disturbance. Once earthwork has begun on a section, it shall be pursued until complete. Within seven days, completed areas should be stabilized, that is, seeded and mulched according to the plans. In some situations, temporary stabilization may be appropriate.
- All disturbed areas above the ordinary high water mark shall be revegetated with appropriate
 native plant species to provide bank stabilization, erosion control, and habitat replacement.
 These activities shall be conducted according to specifications approved by the CDOT landscape
 architect. Temporary seeding shall be done where necessary. Only certified weed-free hay and
 straw shall be used.
- All practicable effort shall be expended to avoid destruction of trees and shrubs in the vicinity of
 streams and in riparian areas. Existing trees within the project area that are not scheduled for
 removal shall be cordoned off from construction activity with temporary construction fencing
 (orange).
- Highway runoff shall be diverted away from the stream channel to avoid siltation and other pollution problems. Where it is necessary to divert runoff directly into the stream channel, intervening water holding or siltation-filtration basins of adequate size shall be constructed.
- Temporary fills, such as cofferdams and temporary road crossings, using imported material shall utilize clean, chemically-free fill to avoid increasing suspended solids or pollution. Fill material shall not be obtained from the live water area in the stream unless approved by Colorado Parks and Wildlife (CPW).



- Discharge of water directly into the stream from cofferdams or new channel construction is prohibited. Such water shall be treated prior to discharge according to the project's Clean Water Act Section 401 or 404 permit.
- Under current CDOT policies, in-stream work is limited to specific periods in order to avoid disruption of fish migration and spawning seasons. Under certain circumstances, instream work during such periods may be allowed. Special techniques are required during such situations and shall be pursued in consultation with staff of the CPW. The timing of such activities will be determined in consultation with CPW.



6. Closing Statement

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

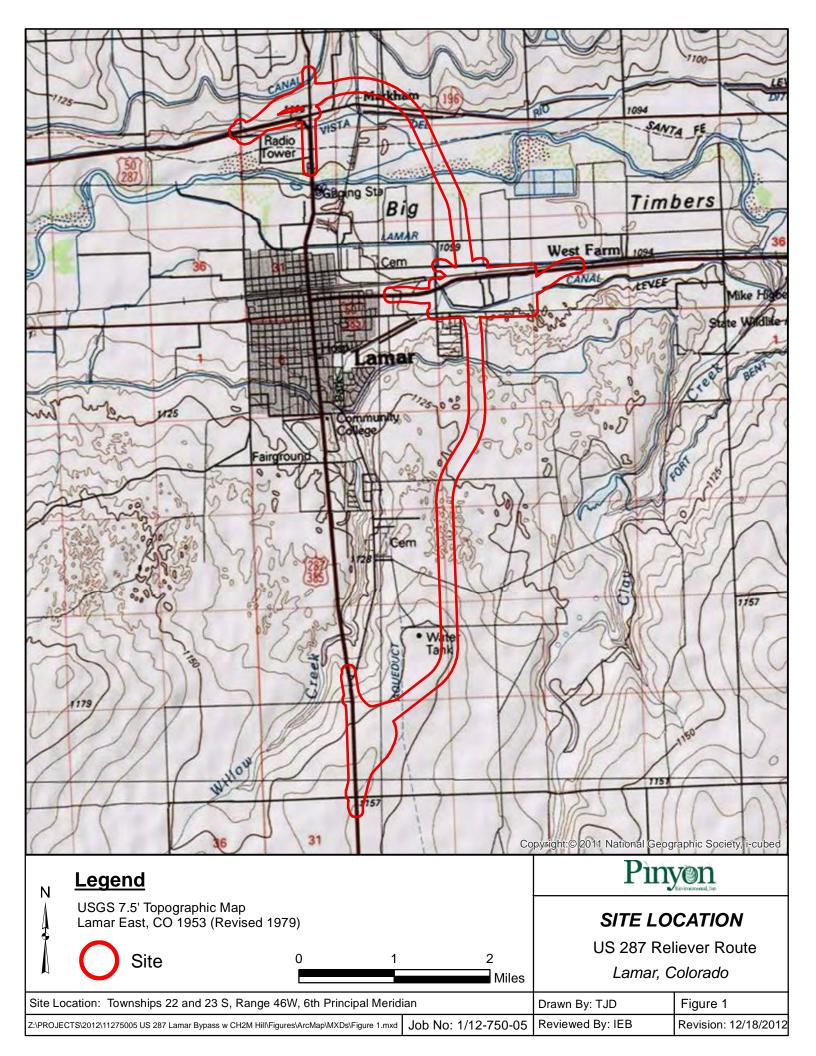


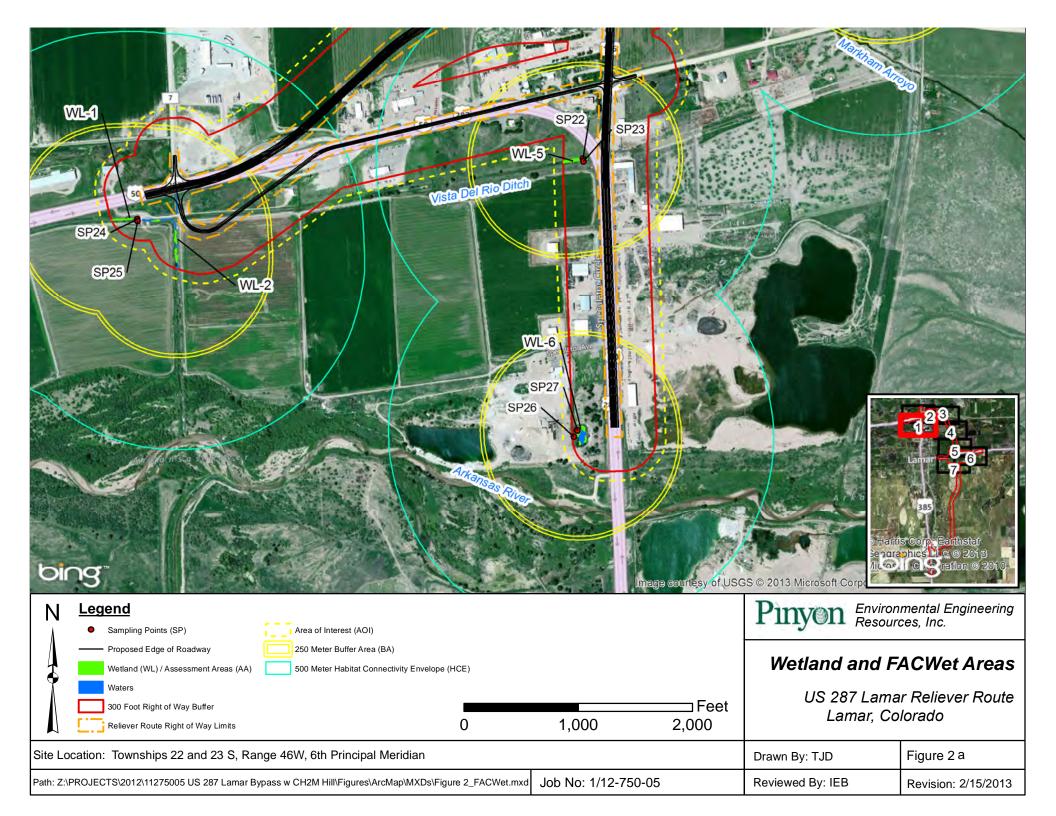
7. References

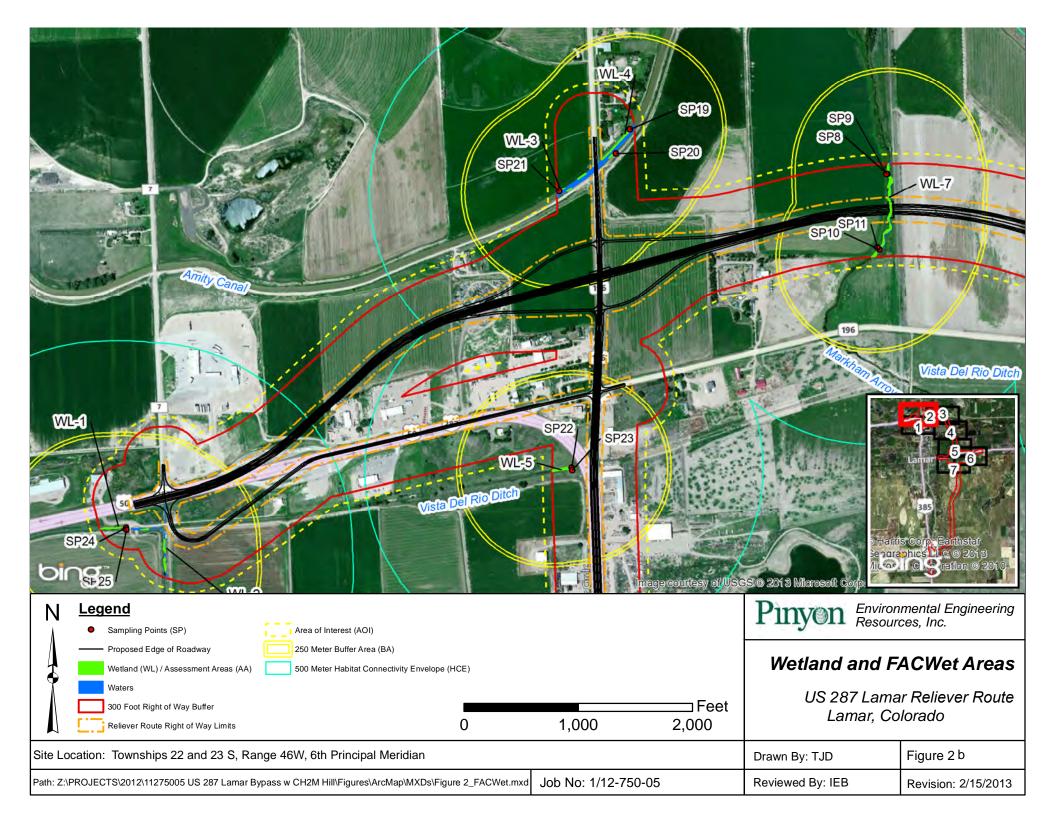
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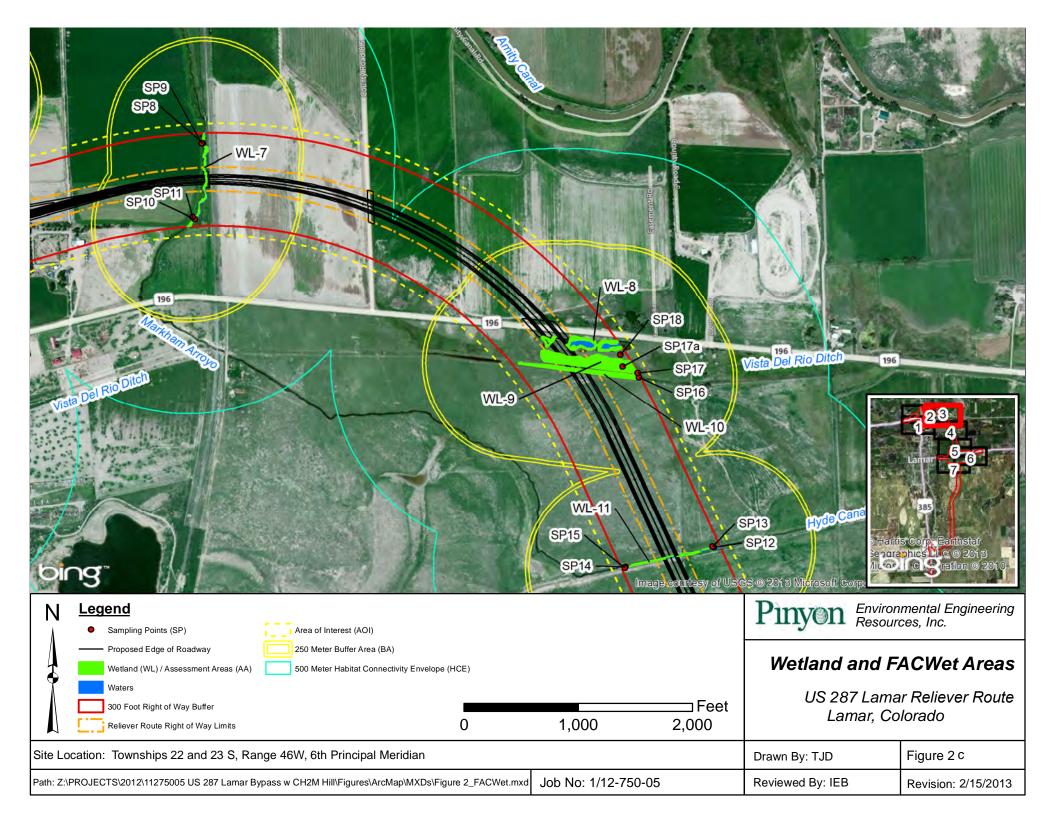


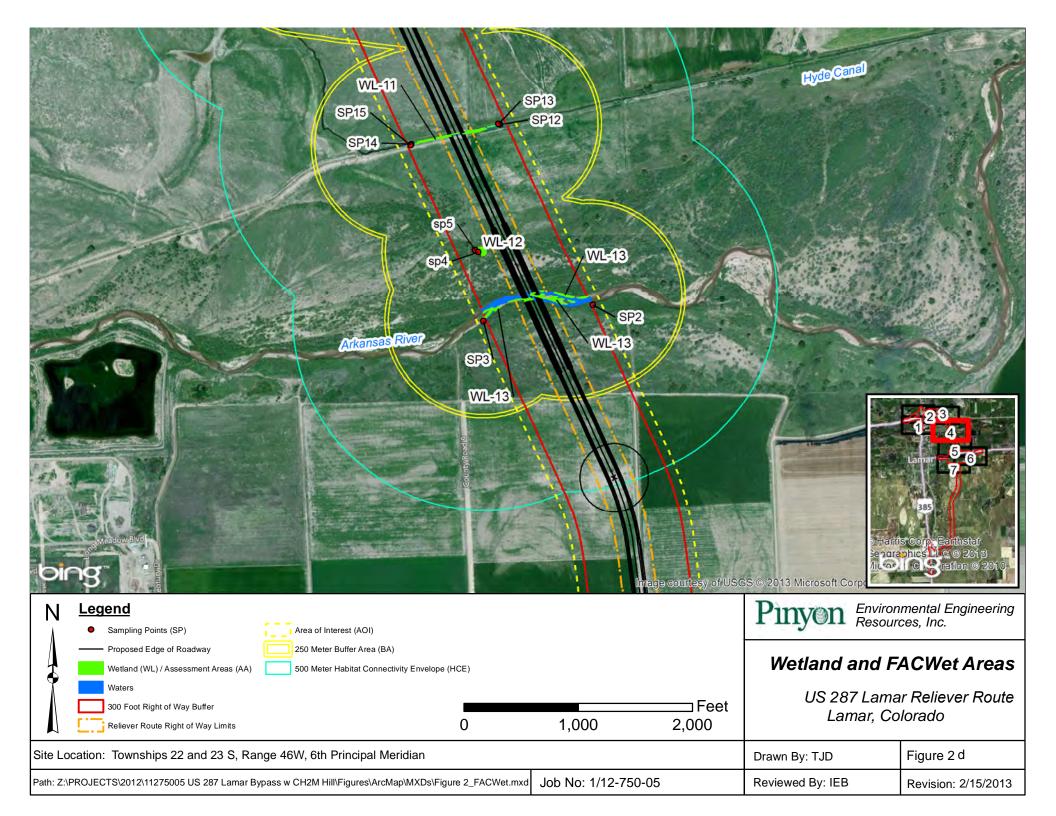
FIGURES

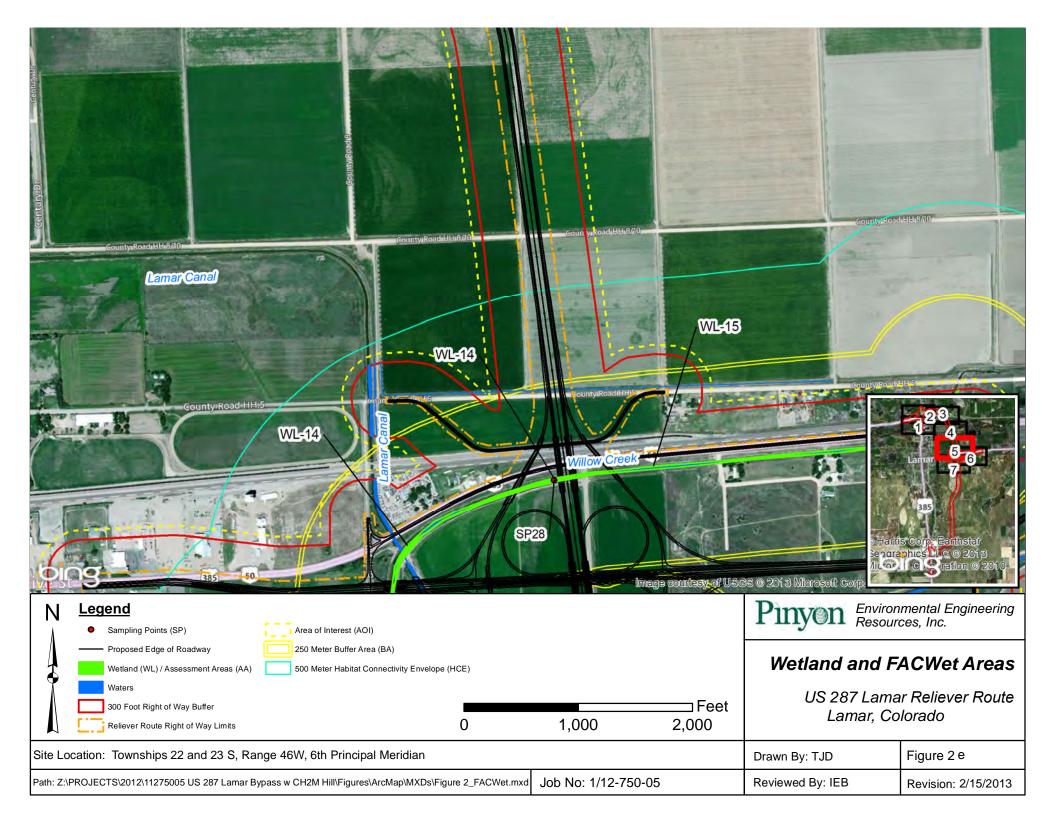


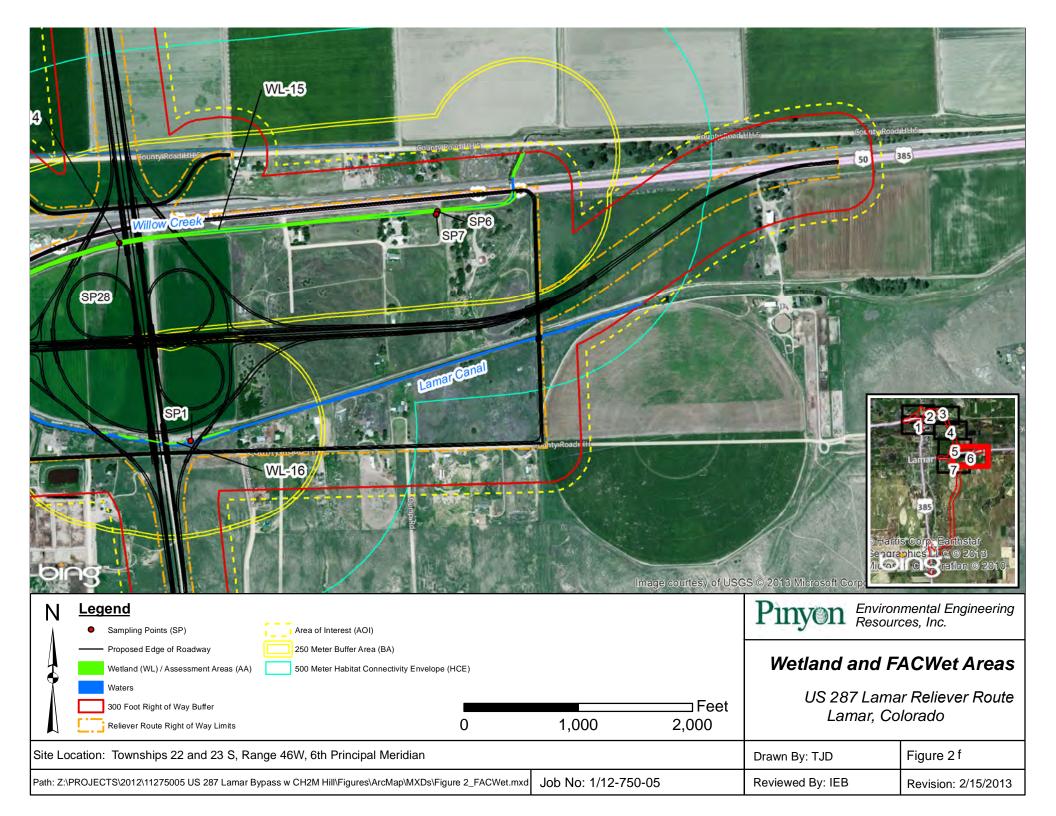


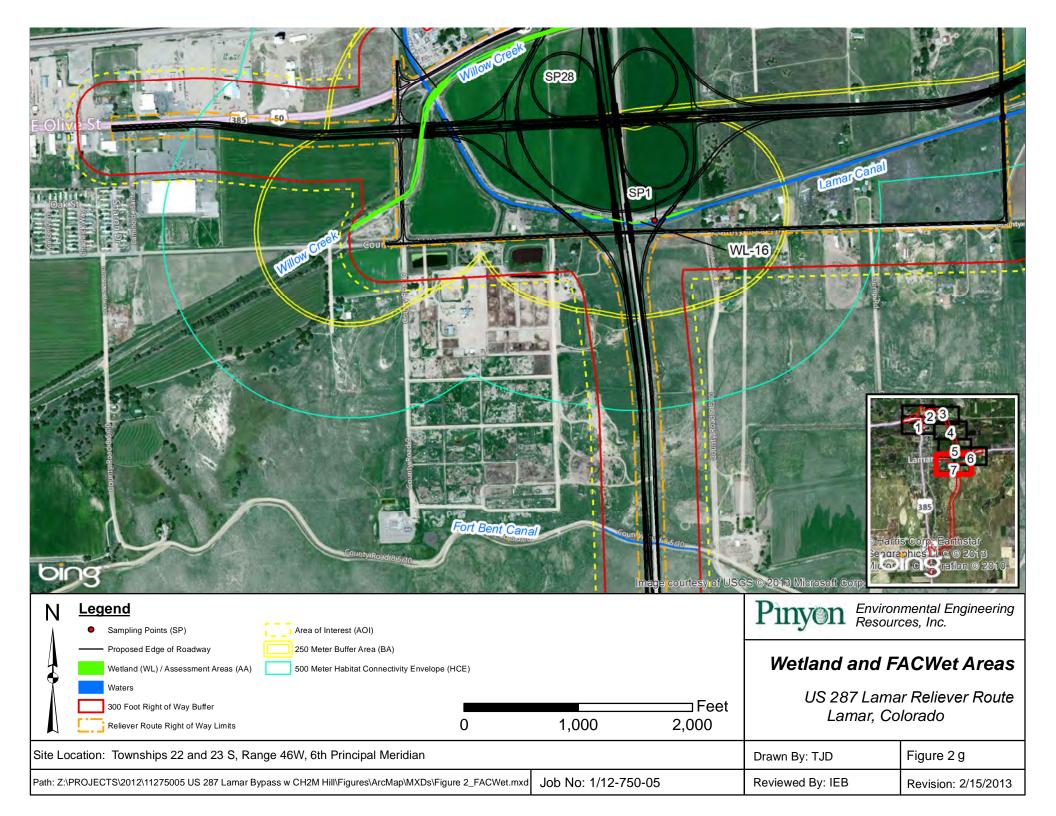


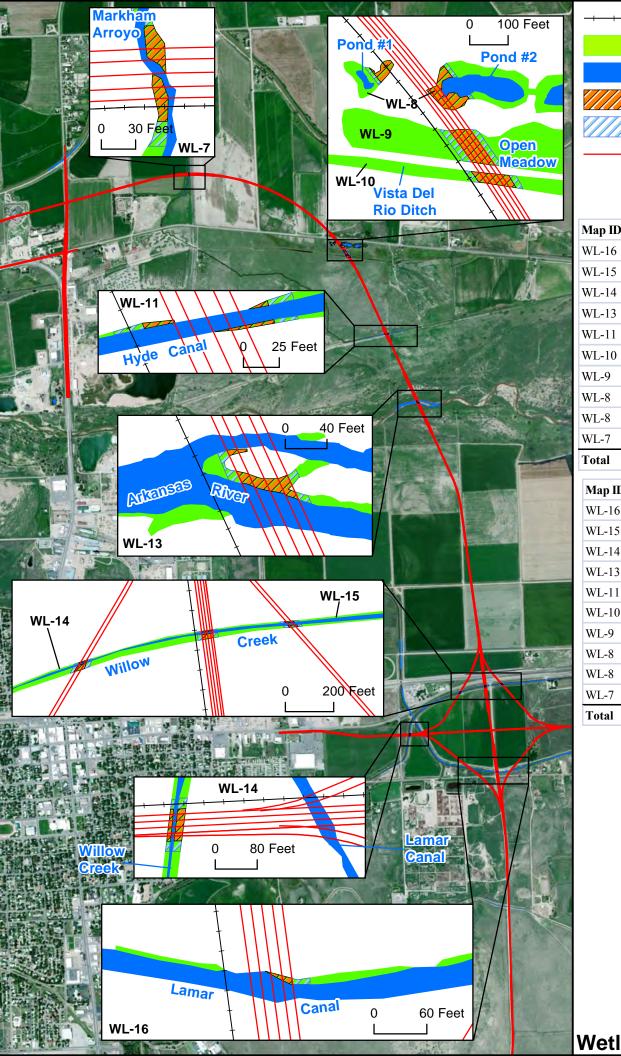












1	 Ultimate Phase Centerline
	Wetlands
	Waters
10.680	Permanent Impact Area
0	Temporary Impact Area

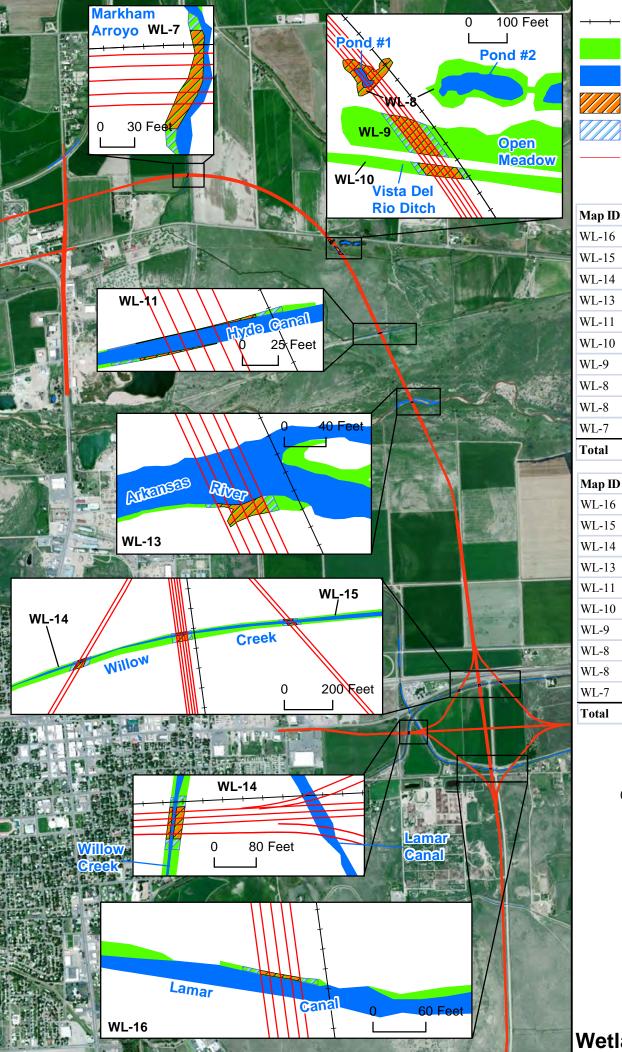
Proposed US 287 and 50

Map ID	Perm Impact to Wetlands
WL-16	0.004 acre
WL-15	0.036 acre
WL-14	0.052 acre
WL-13	0.016 acre
WL-11	0.004 acre
WL-10	0.062 acre
WL-9	0.110 acre
WL-8	0.035 acre
WL-8	0.096 acre
WL-7	0.018 acre
Total	0.433 acre

Map ID	Temp Impact to Wetlands
WL-16	0.003 acre
WL-15	0.033 acre
WL-14	0.040 acre
WL-13	0.010 acre
WL-11	0.004 acre
WL-10	0.026 acre
WL-9	0.081 acre
WL-8	0.010 acre
WL-8	0.012 acre
WL-7	0.008 acre
Total	0.227 acre



Figure 3
Interim Phase
Northbound
Wetlands Impact Areas



Wetlands
Waters

Permanent Impact Area

Temporary Impact Area

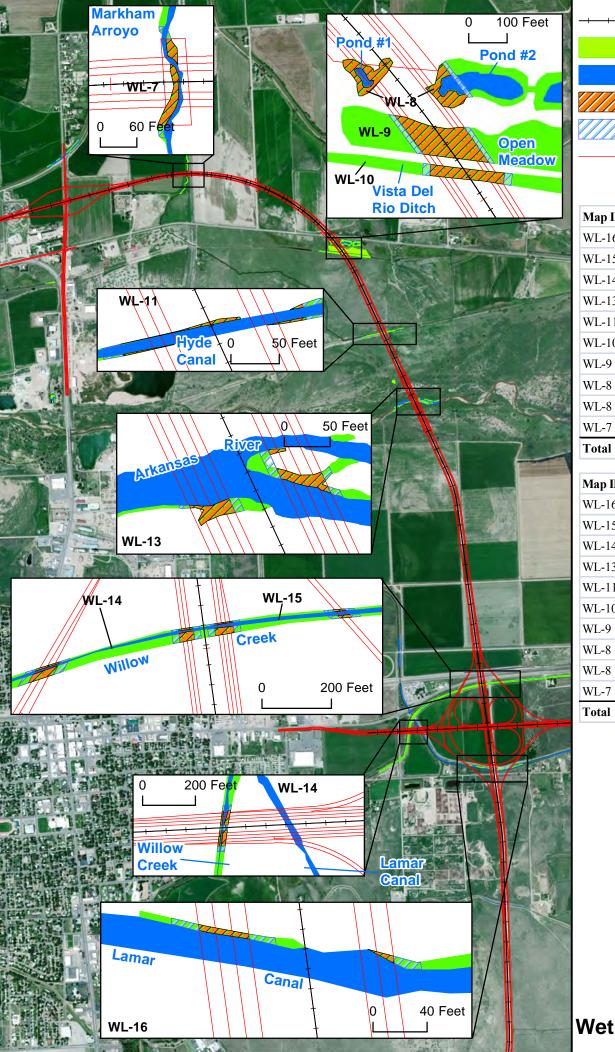
Proposed US 287 and 50

Map ID	Perm Impact to Wetlands
WL-16	0.004 acre
WL-15	0.014 acre
WL-14	0.101 acre
WL-13	0.014 acre
WL-11	0.003 acre
WL-10	0.066 acre
WL-9	0.123 acre
WL-8	0.116 acre
WL-8	0.000 acre
WL-7	0.025 acre
Total	0.466 acre

Map ID	Temp Impact to Wetlands
WL-16	0.010 acre
WL-15	0.012 acre
WL-14	0.065 acre
WL-13	0.005 acre
WL-11	0.003 acre
WL-10	0.025 acre
WL-9	0.083 acre
WL-8	0.000 acre
WL-8	0.000 acre
WL-7	.007 acre
Total	.210 acre



Figure 4
Interim Phase
Southbound
Wetlands Impact Areas



---- Ultimate Phase Centerline
Wetlands
Waters
Permanent Impact Area
Temporary Impact Area

Proposed US 287 and 50

Map ID	Perm Impact to Wetlands
WL-16	0.008 acre
WL-15	0.041 acre
WL-14	0.123 acre
WL-13	0.030 acre
WL-11	0.007 acre
WL-10	0.125 acre
WL-9	0.328 acre
WL-8	0.116 acre
WL-8	0.096 acre
WL-7	0.038 acre
Total	0.912 acre

Map ID	Temp Impact to Wetlands
WL-16	0.009 acre
WL-15	0.036 acre
WL-14	0.119 acre
WL-13	0.015 acre
WL-11	0.004 acre
WL-10	0.004 acre
WL-9	0.059 acre
WL-8	0.000 acre
WL-8	0.014 acre
WL-7	0.001 acre
Total	0.261 acre



Figure 5
Ultimate Phase
Wetlands Impact Areas

APPENDIX A Photographic Log

1. Facing North, View of Unnamed Ditch with No Wetlands, Along US 287/50, at the Western Portion of the Project Area



2. Facing West, View of Wetland 1, at Western Portion of Vista Del Rio Ditch



3. View of Surface Soil Cracks in Palustrine Shrub Scrub Wetland, Wetland 3, at Amity Canal



4. Facing East, View of Palustrine Emergent Wetland, Wetland 4, at **Amity Canal**



5. Facing West, View of Sampling Point 19 at Amity Canal, Wetland



6. View of Sampling Point 19 Soils at Amity Canal, Wetland 4



7. View of Sampling Point 22 Soils at Vista Del Rio Ditch, Wetland 5



8. Facing West, View of Sampling Point 22 and Wetland 5 on Vista Del Rio Ditch



9. Facing Southeast, View of Wetland 6, a Fringe Wetland Around a Small Pond



10. Facing North, View of Sampling Point 8 at Markham Arroyo, Wetland 7



US 287 Lamar Bypass Prowers County, Colorado

11. Facing North, View of Upland Sampling Point 9 at Markham Arroyo



12. Facing North, View of Sampling Point 10 at Markham Arroyo, Wetland



13. Facing North, View of Sampling Point 11 at Markham Arroyo, Wetland



14. Facing East, Depressional Ponds Adjacent South of 196, Wetland 8



15. Facing West, View of Sampling Point 18 North of Vista Del Rio Ditch, Wetland 9



16. Facing West, View of Sampling Point 16, Wetland 10, at Vista Del Rio Ditch



17. Facing Northeast, View of Wetland 11 on Hyde Canal



18. Facing Northeast, View of Wetland 12, Small Pond North of the Arkansas River



19. Facing Northeast, View of Sampling Point 4 at Wetland 12



20. Facing Northwest, View of Sampling Point 5, Upland Adjacent to Wetland 12



21. Facing Northeast, View of Sampling Point 3 and Wetland 13 on the Arkansas River



22. Facing East, View of Arkansas River and Sand Bars



23. Facing South, View of Sampling Point 28 Palustrine Scrub Shrub Wetland at Willow Creek, Wetland 14



24. Facing
West, View of
Sampling Point
7, Upland
Sampling Point
Adjacent to
Willow Creek



25. Facing West, View of Willow Creek, Wetland 15



26. Facing North, View of Sampling Point 6, Wetland 15



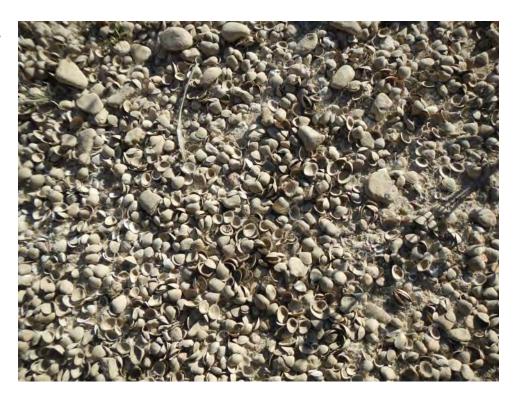
27. Facing Southwest, View of Willow Creek



28. Facing Northeast, View of Wetland 16 Along Lamar Canal



29. Facing East, View of Small Clam Shells on Bottom of Lamar Canal



APPENDIX B Wetland Determination Data Forms

Project/Site: US 287 Lamar Bypass	C	ity/County:	Prowers C	County	Sampling	Date: 10-22-12	2
Applicant/Owner: CDOT	State: CO						
Investigator(s): E. Weber, T. DeMasters	S			nge: Section 33, Town			
Landform (hillslope, terrace, etc.): toe of slope					1		
Subregion (LRR): G- Western Great Plains							
Soil Map Unit Name: Korman clay loam, sand substratum							
Are climatic / hydrologic conditions on the site typical for							
Are Vegetation, Soil, or Hydrology				Normal Circumstances		Yes X No	1
Are Vegetation, Soil, or Hydrology							·
SUMMARY OF FINDINGS – Attach site ma							s, etc.
Hydrophytic Vegetation Present? Yes X	No						
Hydric Soil Present? Yes X			e Sampled		NI.		
Wetland Hydrology Present? Yes X	No	with	n a Wetlan	id? Yes <u>^</u>	No _		
Remarks:							
*Extreme drought conditions (droughtmonitor.unl. Lamar Canal, 20 foot wide, 10 foot deep VEGETATION – Use scientific names of plants of							
	Absolute	Dominant	Indicator	Dominance Test we	orksheet:		
Tree Stratum (Plot size: 30 Ft radius)	% Cover	Species?	Status	Number of Dominan			
1				That Are OBL, FAC\ (excluding FAC-):		1	(A)
2				(excluding FAC-).			(A)
3				Total Number of Dor Species Across All S		1	(B)
4							(D)
Sapling/Shrub Stratum (Plot size: 15 Ft radius) 1	0 =			Percent of Dominant That Are OBL, FAC		100	(A/B)
2				Prevalence Index w	vorksheet:		
3.				Total % Cover o		Multiply by:	
4.				OBL species 90			
5				FACW species			
	•	Total Cov	er	FAC species			_
Herb Stratum (Plot size: 5 Ft radius)	90	V	OBL	FACU species			_
1. Typha angustifolia		1		UPL species Column Totals: 90			
2				Column Totals. <u>55</u>	(A)		_ (D)
3				Prevalence Inc	dex = B/A = _	1.00	_
4. 5.				Hydrophytic Veget	ation Indicate	ors:	
6				X 1 - Rapid Test fo	or Hydrophytic	c Vegetation	
7				X 2 - Dominance		, 052	
8.				X 3 - Prevalence I			
9.				4 - Morphologic	al Adaptations	s' (Provide supp eparate sheet)	porting
10				Problematic Hyd			n)
	90 =	Total Cov	er				
Woody Vine Stratum (Plot size:) 1				¹ Indicators of hydric be present, unless d			nust
2				Hydrophytic			
0/ Page Crawed in 11st 20st 10	=	Total Cov	er	Vegetation Present?	Yes_X	No	
% Bare Ground in Herb Stratum 10 Remarks:	DE - EAC No	Test for budgets	av Drop all EAC	cross examine all other dominants.			ES to DE
	23 TAG Neulla	esc for flyarold	ay. Diop all I AO,	occoo oxamino un otrei dominiditis.	oo /o remaining di	o . Now to OBE, tiell I	_5 10 50.

Depth	Matrix			ox Feature			m the absence	,
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	_ Loc²	Texture	Remarks
0-3	10YR 5/2	90	7.5YR 3/4	10	С	PL	sandy clay loam	Redox feature- root channels
3-18	10YR 4/2	45	7.5YR 3/4	10	С	М	sand/sandy loam	Redox feature- matrix
0 10	· <u> </u>		7.511(0/4					
	10YR 4/3	45						(not a redox feature; 2 soil colors)
				- - -				
			M=Reduced Matrix, C			d Sand G		cation: PL=Pore Lining, M=Matrix.
Hydric Soil	Indicators: (Applie	cable to a	II LRRs, unless othe	rwise no	ted.)		Indicators	for Problematic Hydric Soils ³ :
Histoso	` '			Gleyed M				Muck (A9) (LRR I, J)
	pipedon (A2)			Redox (S				Prairie Redox (A16) (LRR F, G, H)
	listic (A3)			d Matrix (Surface (S7) (LRR G)
	en Sulfide (A4)	- \		-	neral (F1)			Plains Depressions (F16)
	ed Layers (A5) (LRR uck (A9) (LRR F, G,			Gleyed Med Matrix			,	RR H outside of MLRA 72 & 73) ed Vertic (F18)
	ed Below Dark Surface			Dark Surf	' '			arent Material (TF2)
	ark Surface (A12)	00 (/ (/)			urface (F7)		Shallow Dark Surface (TF12)
	Mucky Mineral (S1)			Depression		'		(Explain in Remarks)
	Mucky Peat or Peat	(S2) (LRF			essions (F	16)		of hydrophytic vegetation and
5 cm M	ucky Peat or Peat (S	3) (LRR F	F) (MI	_RA 72 &	73 of LRF	(H)	wetlan	d hydrology must be present,
							unless	disturbed or problematic.
Restrictive	Layer (if present):							
Type:								
Depth (ir	nches):						Hydric Soil	Present? Yes X No No
Remarks:							Hydric Soil	Present? Yes X No No
Remarks:	hydric soil indicate	or for San	dy Redox.				Hydric Soil	Present? Yes X No No
Remarks:		or for San	dy Redox.				Hydric Soil	Present? Yes X No No
Remarks: Very clear	hydric soil indicato	or for San	ndy Redox.				Hydric Soil	Present? Yes X No No
Remarks: Very clear	hydric soil indicato		ndy Redox.				Hydric Soil	Present? Yes X No No
Remarks: Very clear HYDROLO Wetland Hy	hydric soil indicato	:	ndy Redox.	ly)				Present? Yes X No
Remarks: Very clear HYDROLO Wetland Hy Primary Ind	hydric soil indicato	:					Seconda	
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface	hydric soil indicate OGY /drology Indicators icators (minimum of	:	ed; check all that app	t (B11)	es (B13)		Seconda X Sur	ary Indicators (minimum of two required
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface	hydric soil indicator OGY /drology Indicators icators (minimum of a Water (A1) fater Table (A2)	:	ed; check all that app	t (B11) overtebrate			Seconda X Sur Spa	ary Indicators (minimum of two required face Soil Cracks (B6)
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface High W Saturat	hydric soil indicator OGY /drology Indicators icators (minimum of a Water (A1) fater Table (A2)	:	red; check all that app X Salt Crus X Aquatic Ir — Hydrogen	t (B11) nvertebrate Sulfide C			Seconda X Sur _ Spa _ Dra	ary Indicators (minimum of two required face Soil Cracks (B6) rrsely Vegetated Concave Surface (B8)
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface High W Saturat Water N	hydric soil indicator OGY Idrology Indicators icators (minimum of et Water (A1) Idrater Table (A2) ion (A3)	:	red; check all that app X Salt Crus X Aquatic Ir — Hydrogen	t (B11) nvertebrate Sulfide C on Water	dor (C1) Table (C2)		Seconda X Sur Spa Dra Oxid	ary Indicators (minimum of two required face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) inage Patterns (B10)
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface High W Saturat Water N Sedime	hydric soil indicator OGY /drology Indicators icators (minimum of a Water (A1) ater Table (A2) ion (A3) Marks (B1)	:	red; check all that app X Salt Crus X Aquatic Ir Hydrogen Dry-Seas Oxidized	t (B11) nvertebrate Sulfide C on Water	dor (C1) Table (C2) eres on Liv		Seconda X Sur Spa Dra Oxio (C3)	ary Indicators (minimum of two required face Soil Cracks (B6) Irsely Vegetated Concave Surface (B8) Inage Patterns (B10) Idized Rhizospheres on Living Roots (C3
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface High W Saturat Water N Sedime Drift De	hydric soil indicators ydrology Indicators icators (minimum of of other water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3)	:	x Salt Crusi X Aquatic Ir Hydrogen Dry-Seas Oxidized (where	t (B11) nvertebrate Sulfide C on Water Rhizosphe not tilled	dor (C1) Table (C2) eres on Liv	ing Roots	Seconda X Sur Spa Dra Oxio (C3) (v Cra	ary Indicators (minimum of two required face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) arsely Patterns (B10) dized Rhizospheres on Living Roots (C3
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface High W Saturat Water N Sedime Drift De	hydric soil indicators odry odrology Indicators icators (minimum of odrology indicators) water (A1) ater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4)	:	x Salt Crus: x Aquatic Ir Hydrogen Dry-Seas Oxidized (where	t (B11) nvertebrate Sulfide Con Water Rhizosphe not tilled of Reduc	rdor (C1) Table (C2) eres on Liv) ed Iron (C4	ing Roots	Seconda X Sur Spa Dra Oxio (C3) (v Cra Satu	ary Indicators (minimum of two required face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 where tilled) yfish Burrows (C8)
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface High W Saturat Water N Sedime Drift De Algal M Iron De	hydric soil indicators rdrology Indicators icators (minimum of et Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5)	: one requir	x Salt Crusi X Aquatic Ir Hydrogen Dry-Seas Oxidized (where Thin Muc	t (B11) nvertebrate Sulfide Con Water Rhizosphe not tilled of Reduc	rdor (C1) Table (C2) eres on Liv) ed Iron (C4) (C7)	ing Roots	Seconda X Sur Spa Dra Oxio (V) Cra Sato X Geo	ary Indicators (minimum of two required face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3) urhere tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) omorphic Position (D2)
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface High W Saturat Water I Sedime Drift De Algal M Iron De X Inundat	hydric soil indicators odry odrology Indicators icators (minimum of odrology indicators) water (A1) ater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4)	: one requir	x Salt Crusi X Aquatic Ir Hydrogen Dry-Seas Oxidized (where Thin Muc	t (B11) nvertebrate Sulfide Con Water Rhizosphe not tilled of Reduc	rdor (C1) Table (C2) eres on Liv) ed Iron (C4) (C7)	ing Roots	Seconda X Sur Spa Dra Oxio (V) Cra Sato X Geo	ary Indicators (minimum of two required face Soil Cracks (B6) arsely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3) where tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9)
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface High W Saturat Water I Sedime Drift De Algal M Iron De X Inundat	hydric soil indicators ydrology Indicators icators (minimum of a Water (A1) later Table (A2) ion (A3) Warks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aerial Stained Leaves (B9)	: one requir	x Salt Crusi X Aquatic Ir Hydrogen Dry-Seas Oxidized (where Thin Muc	t (B11) nvertebrate Sulfide Con Water Rhizosphe not tilled of Reduc	rdor (C1) Table (C2) eres on Liv) ed Iron (C4) (C7)	ing Roots	Seconda X Sur Spa Dra Oxio (V) Cra Sato X Geo	ary Indicators (minimum of two required face Soil Cracks (B6) Irsely Vegetated Concave Surface (B8) Inage Patterns (B10) Idized Rhizospheres on Living Roots (C3 Inhere tilled) Infish Burrows (C8) Invariation Visible on Aerial Imagery (C9) Incomphic Position (D2) Incomplic Roots (D5)
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface High W Saturat Water N Sedime Drift De Algal M Iron De X Inundat X Water-S Field Obse	hydric soil indicators ydrology Indicators icators (minimum of or water (A1) dater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) dat or Crust (B4) eposits (B5) ition Visible on Aerial Stained Leaves (B9) rvations:	: one requir	x Salt Crusi X Aquatic Ir Hydrogen Dry-Seas Oxidized (where Presence Thin Muci	t (B11) avertebrate Sulfide Con Water Rhizosphe not tilled of Reduc k Surface plain in R	rdor (C1) Table (C2) eres on Liv ed Iron (C4 (C7) emarks)	ing Roots	Seconda X Sur Spa Dra Oxio (V) Cra Sato X Geo	ary Indicators (minimum of two required face Soil Cracks (B6) Irsely Vegetated Concave Surface (B8) Inage Patterns (B10) Idized Rhizospheres on Living Roots (C3 Inhere tilled) Infish Burrows (C8) Invariation Visible on Aerial Imagery (C9) Incomphic Position (D2) Incomplic Roots (D5)
Remarks: Very clear IYDROLO Wetland Hy Primary Ind Surface High W Saturat Water N Sedime Drift De Algal M Iron De X Inundat X Water-S Field Obse	hydric soil indicators ydrology Indicators icators (minimum of ote Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) ion Visible on Aerial Stained Leaves (B9) rvations: ter Present?	: one requir Imagery (x Salt Crusi X Aquatic Ir Hydrogen Dry-Seas Oxidized (where Presence Thin Muci	t (B11) nvertebrate Sulfide Con Water Rhizosphe not tilled of Reduc k Surface plain in R	dor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7) emarks)	ing Roots	Seconda X Sur Spa Dra Oxio (V) Cra Sato X Geo	ary Indicators (minimum of two required face Soil Cracks (B6) Irsely Vegetated Concave Surface (B8) Inage Patterns (B10) Idized Rhizospheres on Living Roots (C3 Inhere tilled) Infish Burrows (C8) Invariation Visible on Aerial Imagery (C9) Incomphic Position (D2) Incomplic Roots (D5)
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface High W Saturat Water N Sedime Drift De Algal M Iron De X Inundat X Water-S Field Obse Surface Water Table Saturation F	hydric soil indicators ydrology Indicators icators (minimum of a Water (A1) ater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) ition Visible on Aerial Stained Leaves (B9) rvations: ter Present? Present?	: one requir Imagery (Yes	x Salt Crusi X Aquatic Ir Hydrogen Dry-Seas Oxidized (where Presence Thin Muci	t (B11) nvertebrate Sulfide Con Water Rhizosphe not tilled of Reduc k Surface plain in R	dor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7) emarks)	ing Roots	Seconda X Sur Spa Dra Oxid (C3) (w Cra Satu X Geo FAC Fros	ary Indicators (minimum of two required face Soil Cracks (B6) Irsely Vegetated Concave Surface (B8) Inage Patterns (B10) Idized Rhizospheres on Living Roots (C3 Inhere tilled) Infish Burrows (C8) Invariation Visible on Aerial Imagery (C9) Incomphic Position (D2) Incomplic Roots (D5)
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface High W Saturat Water N Sedime Drift De Algal M Iron De X Inundat X Water S Field Obse Surface Water Table Saturation F (includes ca	hydric soil indicators ydrology Indicators icators (minimum of a Water (A1) ater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aerial Stained Leaves (B9) rvations: ter Present? Present?	: one requir Imagery (Yes Yes	x Salt Crusi x Aquatic Ir Hydrogen Dry-Seas Oxidized (where Presence Thin Muci B7) Other (Ex	t (B11) nvertebrate Sulfide Con Water Rhizosphe not tilled of Reduct k Surface plain in R	rdor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7) emarks)	ing Roots i) Wet	Seconda X	ary Indicators (minimum of two required face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 where tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) comorphic Position (D2) C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface High W Saturat Water N Sedime Drift De Algal M Iron De X Inundat X Water S Field Obse Surface Water Table Saturation F (includes ca	hydric soil indicators ydrology Indicators icators (minimum of a Water (A1) ater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aerial Stained Leaves (B9) rvations: ter Present? Present?	: one requir Imagery (Yes Yes	x Salt Cruss X Aquatic Ir Hydrogen Dry-Seas Oxidized (where Presence Thin Muci B7) No X Depth (ir	t (B11) nvertebrate Sulfide Con Water Rhizosphe not tilled of Reduct k Surface plain in R	rdor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7) emarks)	ing Roots i) Wet	Seconda X	ary Indicators (minimum of two required face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 where tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) comorphic Position (D2) C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)
Remarks: Very clear HYDROLO Wetland Hy Primary Ind Surface High W Saturat Water N Sedime Jrift De Algal M Iron De X Inundat X Water-S Field Obse Surface Wa Water Table Saturation F (includes ca	hydric soil indicators ydrology Indicators icators (minimum of a Water (A1) ater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aerial Stained Leaves (B9) rvations: ter Present? Present?	: one requir Imagery (Yes Yes	x Salt Crusi x Aquatic Ir Hydrogen Dry-Seas Oxidized (where Presence Thin Muci B7) Other (Ex	t (B11) nvertebrate Sulfide Con Water Rhizosphe not tilled of Reduct k Surface plain in R	rdor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7) emarks)	ing Roots i) Wet	Seconda X	ary Indicators (minimum of two required face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (C3 where tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) comorphic Position (D2) C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)
Remarks: Very clear Very clear Wetland Hy Primary Ind Surface High W Saturat Water N Sedime Drift De Algal M Iron De X Inundat X Water-S Field Obse Surface Water Table Saturation F (includes ca Describe Re	hydric soil indicators icators (minimum of or	: one requir Imagery (Yes Yes Yes n gauge, r	x Salt Crusi x Aquatic Ir Hydrogen Dry-Seas Oxidized (where Presence Thin Muci B7) Other (Ex	t (B11) nvertebrate Sulfide Con Water Rhizosphe not tilled of Reduct k Surface plain in Reduct nches): nches): photos, p	revious ins	ing Roots i) Wet	Seconda X Sur Spa Dra Oxio (C3) (V Cra Sati X Gec FAC Fros	ary Indicators (minimum of two required face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) inage Patterns (B10) dized Rhizospheres on Living Roots (Carlete tilled) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) comorphic Position (D2) C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)

Project/Site: US 287 Lamar Bypass	(City/Count	ty: Prowers (County	Sampling Date: 10-23-12
Applicant/Owner: CDOT				State: CO	
••				nge: Section 28, Townsh	
Landform (hillslope, terrace, etc.): Terrace					
	Lat: 38.1				Datum: NAD 83
Soil Map Unit Name: Lincoln sand	Lut			NWI classifi	
Are climatic / hydrologic conditions on the site typical for ti	his times of vo				
Are Vegetation, Soil, or Hydrology					present? Yes x No No
Are Vegetation, Soil, or Hydrology SUMMARY OF FINDINGS – Attach site maj				eeded, explain any answe	
SUMMART OF FINDINGS – Attach site map	Silowing	Sampin	ng point i	ocations, transects	s, important leatures, etc.
Hydrophytic Vegetation Present? Yes X		ls t	the Sampled	l Area	
Hydric Soil Present? Yes		wit	hin a Wetlar	nd? Yes	No <u>×</u>
Wetland Hydrology Present? Yes	No <u>*</u>				
*Extreme drought conditions (droughtmonitor.unl.e	du)				
Soil pit completed approximately 6-8 feet above th attempted control of tamarisk.		nant hyd	lric soil, dea	nd willow canes and ta	marisk, likely due to
VEGETATION – Use scientific names of pla	nte				
VEGETATION – 03c 3cicinatic flames of pla		Dominar	nt Indicator	Dominance Test worl	vehoot:
Tree Stratum (Plot size: 30 Ft radius)			? Status	Number of Dominant S	
1				That Are OBL, FACW,	or FAC
2				(excluding FAC-):	<u>3</u> (A)
3				Total Number of Domin	•
4				Species Across All Stra	ata: <u>3</u> (B)
Sapling/Shrub Stratum (Plot size: 15 Ft radius)	0	= Total Co	over	Percent of Dominant S	
1. Salix exigua	1	Υ	FACW	That Are OBL, FACW,	or FAC: 100 (A/B)
2. Tamarix ramosissima	1	Υ	FACW	Prevalence Index wo	ksheet:
3.					Multiply by:
4.					x 1 = 1
5					x 2 = 4
5 Et radius	2	= Total Co	over		x 3 =
Herb Stratum (Plot size: 5 Ft radius) 1. Carex nebrascensis	1	Υ	OBL	FACU species UPL species	x 4 = x 5 =
					(A) $\frac{5}{5}$ (B)
2					
4				Prevalence Index	
5				Hydrophytic Vegetati	
6.				X 1 - Rapid Test forX 2 - Dominance Test	Hydrophytic Vegetation nants are FACW and/or OBL.
7					
8				X 3 - Prevalence Ind	lex is ≤3.0° Adaptations¹ (Provide supporting
9				data in Remark	adaptations (Provide supporting as or on a separate sheet)
10				Problematic Hydro	phytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size:)	1	= Total Co	over	¹ Indicators of hydric so	il and wetland hydrology must
1				be present, unless dist	
2				Hydrophytic	
	^	= Total Co		Vegetation Present? Ye	es <u>X</u> No
% Bare Ground in Herb Stratum 40 Remarks:	DE EAGN :	rol Toet feet	rology Dans : " E s o		
57% coverage of dead willow canes and tamarisk.					50% remaining are FACW to OBL, then YES to D5. scant vegetation present is
all obligate or facultative-wet.			55, 110 10	-ga	regeration process to

Profile Desc	cription: (Describe	to the de	pth needed to docu	ment the	indicator	or confir	m the absence	of indicators.)
Depth	Matrix			x Feature		2	_	
(inches)	Color (moist)	%	Color (moist)	%	Type'	Loc ²	Texture	Remarks
0-3	10YR 5/3	100					loamy sand	
3-7.5	2.5Y 5/3	98	7.5 YR 4/4	2	С	PL	loamy sand	Redox features distinct
7.5-10.5	10YR 6/4	100		_			sand	
10.5-12	10YR 5/4	95	10YR 5/6	5	С	М	loamy sand	Redox features
		_		_	_			
								-
						-		
1Typo: C=C	ncontration D-Dor	lotion PM	 I=Reduced Matrix, C	S=Cover		nd Sand C	Proins 21 oc	cation: PL=Pore Lining, M=Matrix.
			I LRRs, unless othe			u Sanu C		for Problematic Hydric Soils ³ :
Histosol		abio to ai			latrix (S4)			Muck (A9) (LRR I, J)
	oipedon (A2)			Redox (S				Prairie Redox (A16) (LRR F, G, H)
Black Hi				d Matrix (Surface (S7) (LRR G)
	en Sulfide (A4)				ineral (F1)			Plains Depressions (F16)
	d Layers (A5) (LRR	F)		-	/atrix (F2)		_	R H outside of MLRA 72 & 73)
1 cm Mu	ıck (A9) (LRR F, G ,	H)	Deplete	ed Matrix	(F3)		Reduc	ed Vertic (F18)
Depleted	d Below Dark Surfac	e (A11)	Redox	Dark Surl	face (F6)			arent Material (TF2)
	ark Surface (A12)				urface (F7))		hallow Dark Surface (TF12)
	flucky Mineral (S1)			Depressi				(Explain in Remarks)
	Mucky Peat or Peat				ressions (F			of hydrophytic vegetation and
5 CM IVIL	ıcky Peat or Peat (S	3) (LKK F) (IVIL	.KA /2 &	73 of LRR	(H)		d hydrology must be present, disturbed or problematic.
Restrictive I	Layer (if present):						dilicoo	distance of problematic.
Type:	, , ,							
Depth (in	ches):						Hydric Soil	Present? Yes No _x
Remarks:								
Layer in upp	per 6 inches with r	edox fea	tures too thin to qu	alify for	Sandy Re	dox. 3 in	thick, and nee	eds to be 4 in thick.
			·	-	-			
HYDROLO	CV							
	drology Indicators:							
_			ed; check all that appl	lv.)			Sacanda	ary Indicators (minimum of two required)
	•	ne require						ary Indicators (minimum of two required)
	Water (A1)		Salt Crust		(D40)			race Soil Cracks (B6)
_	ater Table (A2)		Aquatic In		. ,			rsely Vegetated Concave Surface (B8)
Saturatio	, ,		Hydrogen		, ,			nage Patterns (B10)
	larks (B1)				Table (C2)			dized Rhizospheres on Living Roots (C3)
	nt Deposits (B2)				eres on Liv	ing Roots		where tilled)
	posits (B3)			not tilled		4\		yfish Burrows (C8)
	at or Crust (B4)				ced Iron (C4	+)		uration Visible on Aerial Imagery (C9)
-	oosits (B5)	l	Thin Muck					emorphic Position (D2)
	on Visible on Aerial	ımagery (E	37) Other (Ex	piain in R	emarks)			c-Neutral Test (D5)
Field Obser	tained Leaves (B9)						FIUS	st-Heave Hummocks (D7) (LRR F)
Surface Wat		/oc	No X Depth (in	rches).				
Water Table			No X Depth (in					
Saturation P			No X Depth (in				tland Hvdrolog	y Present? Yes No ×
(includes car	oillary fringe)							
Describe Re	corded Data (stream	n gauge, m	nonitoring well, aerial	photos, p	revious ins	pections)), if available:	
Remarks:	hava Diver							
6 to 8 feet a	bove River.							

Project/Site: US 287 Lamar Bypass		City/Co	ounty: Prowers	County	Sampling Date: 10-23	3-12
Applicant/Owner: CDOT				Sampling Point: SP-3		
Investigator(s): E. Weber, T. DeMasters, G. Cosyleon				inge: Section 28, Towns		
				Slope (%): 0		
Subregion (LRR): G- Western Great Plains						
Soil Map Unit Name: n/a (mapped as water)				NWI classif		
Are climatic / hydrologic conditions on the site typical for						
Are Vegetation, Soil, or Hydrology					" present? Yes X	No
Are Vegetation, Soil, or Hydrology	-					
SUMMARY OF FINDINGS – Attach site ma						res, etc.
Hydrophytic Vegetation Present? Yes X	No		la Alan Camanila			
Hydric Soil Present? Yes x	No		Is the Sampled within a Wetlan		No	
Wetland Hydrology Present? Yes X	No		within a wetia	iid: 165	No	
Remarks: *Extreme drought conditions (droughtmonitor.unl.edu) Small terrace approximately 1 inch above OHWM VEGETATION – Use scientific names of plants of plants of the scientific names of	, sandy, vege	etated	sand and gra	vel bars in Arkansas I	River.	
		Domi	inant Indicator	Dominance Test wo	rksheet:	
Tree Stratum (Plot size: 30 Ft radius)			ies? Status	Number of Dominant		
1				That Are OBL, FACW (excluding FAC-):	/, or FAC 3	(A)
2				, , ,		(,,)
3		-		Total Number of Dom Species Across All St	^	(B)
4	0	= Tota	Il Cover			_
Sapling/Shrub Stratum (Plot size: 15 Ft radius)				Percent of Dominant : That Are OBL, FACW		(A/B)
1. Tamarisk ramosissma	40		FACW	Prevalence Index wo	orkshoot:	
2. Populus deltoides	1	N	FAC	Total % Cover of:		
3					x 1 = 3	
4				FACW species 87		
5	41	= Tota	Il Cover	FAC species 51	x 3 = 153	
Herb Stratum (Plot size: 5 Ft radius		- 10ta	ii Covei	FACU species	x 4 =	<u> </u>
1. Panicum capillare	50	Υ	FAC		x 5 =	
2. Hordeum jubatum	30	Υ	FACW	Column Totals: 141	(A) <u>330</u>	(B)
3. Phragmites australis		N	FACW	Prevalence Inde	ex = B/A = 2.34	
Cyperus esculentes Alopecurus geniculatus	<u>5</u> 	N N	FACW_OBL	Hydrophytic Vegeta	·	
Alopecurus geniculatus Juncus arcticus	2	N	FACW	1 - Rapid Test for	r Hydrophytic Vegetation	
			17.00	X 2 - Dominance Te	minants are FACW and/or OBL. est is >50%	
7 8				X 3 - Prevalence In	dex is ≤3.0 ¹	
9.				4 - Morphological	I Adaptations ¹ (Provide s	upporting
10					rks or on a separate shee rophytic Vegetation ¹ (Exp	,
	400	= Tota	I Cover			
Woody Vine Stratum (Plot size:) 1					soil and wetland hydrolog sturbed or problematic.	y must
2				Hydrophytic		
0/ Base Crawad in Harb Oters on 0		= Tota	l Cover	Vegetation Present? Y	/es_ ^X No	
% Bare Ground in Herb Stratum 0 Remarks:	DE - EAC No	tral Tost for	r hydrology Drop all EAC		> 50% remaining are FACW to OBL, th	en VES to DE
	50 I AO NEUL	700t IUI	, aranagy. Drop all i AC	,		, 20 (0 00).

Profile Desc	cription: (Describe	to the depth i	needed to docu	ment the	indicator	or confirm	n the absence	e of indicators.)			
Depth	Matrix			x Feature	4	. 2					
(inches)	Color (moist)		Color (moist)	%	Type'	Loc ²	Texture	Remarks			
0-0.5	5Y 4/3	_ 100		<u> </u>			muck	top layer shows some redox			
0.5-7.5	10YR 5/4	_ 100		_	·		sand	coarse			
7.5-9.5	Gley1 2.5Y/N	100		_			silt				
9.5-18	10YR 5/4	100					sand	coarse			
				_							
¹ Type: C=C	oncentration, D=De	pletion. RM=Re	duced Matrix. C	S=Covere	d or Coate	d Sand G	rains. ² Lo	cation: PL=Pore Lining, M=Matrix.			
	Indicators: (Applie							for Problematic Hydric Soils ³ :			
Histosol	(A1)		Sandy	Gleyed Ma	atrix (S4)		1 cm l	Muck (A9) (LRR I, J)			
Histic E	pipedon (A2)		Sandy	Redox (S5	5)		Coast	Prairie Redox (A16) (LRR F, G, H)			
	istic (A3)			d Matrix (S	,		·	Surface (S7) (LRR G)			
	en Sulfide (A4)			Mucky Mi			_	Plains Depressions (F16)			
	d Layers (A5) (LRR	,		Gleyed M			`	RR H outside of MLRA 72 & 73)			
	uck (A9) (LRR F, G, d Below Dark Surfac			ed Matrix (Dark Surfa				ced Vertic (F18) Parent Material (TF2)			
	ark Surface (A12)	Se (ATT)			urface (F7)			Shallow Dark Surface (TF12)			
	Mucky Mineral (S1)			Depressio				(Explain in Remarks)			
	Mucky Peat or Peat	(S2) (LRR G , H			essions (F	16)		of hydrophytic vegetation and			
5 cm Mu	ucky Peat or Peat (S	33) (LRR F)	(ML	RA 72 &	73 of LRR	H)	wetlan	nd hydrology must be present,			
							unless	s disturbed or problematic.			
	Layer (if present):										
, , , <u> </u>			_								
	ches):		_				Hydric Soi	I Present? Yes X No No			
Remarks:	ry distinct layers; t	typical of a de	nositional envi	ronment							
Joli Has vei	ry distillet layers, t	lypical of a de	positional envi	ioiiiieiit.							
HYDROLO	GY										
Wetland Hy	drology Indicators	:									
	cators (minimum of	one required; c						ary Indicators (minimum of two required)			
Surface			Salt Crust				Surface Soil Cracks (B6)				
	ater Table (A2)		Aquatic In				Sparsely Vegetated Concave Surface (B8)				
X Saturation			X Hydrogen		, ,		Drainage Patterns (B10)				
	farks (B1)		Dry-Seaso			_		dized Rhizospheres on Living Roots (C3)			
	nt Deposits (B2)		Oxidized I			ng Roots	. ,	where tilled)			
	posits (B3)		,	not tilled)				nyfish Burrows (C8)			
	at or Crust (B4)		Presence		•	+)		ruration Visible on Aerial Imagery (C9)			
	posits (B5)	I (D7)	X Thin Muck		` '			omorphic Position (D2)			
	on Visible on Aerial Stained Leaves (B9)	imagery (B7)	Other (Ex	piain in Re	emarks)			C-Neutral Test (D5)			
Field Obser	` '						FIO	st-Heave Hummocks (D7) (LRR F)			
Surface Wat		Vas No	X Depth (in	iches).							
Water Table			Depth (in			_					
Saturation P			Depth (in			Wet	land Hydrolog	y Present? Yes × No			
(includes car	pillary fringe)							y riesent: Tes <u>x</u> No			
Describe Re	corded Data (stream	n gauge, monite	oring well, aerial	photos, pr	evious ins	pections),	, if available:				
Remarks:											

Project/Site: US 287 Lamar Bypass		City/Cou	nty: Prowers C	County Sampling Date: 10-23-			
Applicant/Owner: CDOT				State: CO			
Investigator(s): T. DeMasters, E. Weber, G. Cosyleon				nge: Section 28, Townsh			
Landform (hillslope, terrace, etc.): terrace					Slope (%): 4		
Subregion (LRR): G- Western Great Plains	Lat: 38.1	1081414	599	Long: -102.59484067	Datum: NAD 83		
Soil Map Unit Name: Lincoln sand				NWI classifi			
Are climatic / hydrologic conditions on the site typical for							
Are Vegetation, Soil, or Hydrology					present? Yes X No		
Are Vegetation, Soil, or Hydrology				eded, explain any answ			
SUMMARY OF FINDINGS – Attach site n	nap showing	samp	ling point l	ocations, transects	s, important features, etc.		
Hydrophytic Vegetation Present? Yes X	No		the Commission	Area			
Hydric Soil Present? Yes x	No		s the Sampled vithin a Wetlar		No		
Wetland Hydrology Present? Yes x	No	•	ritiiii a vvetiai	iu: 165			
Remarks:							
*Extreme drought conditions (droughtmonitor.ur Depressional wetland, north of Arkansas River, VEGETATION – Use scientific names of I	water source a	appears	to be a pipe				
20 Fé radius	Absolute		ant Indicator	Dominance Test wor	ksheet:		
Tree Stratum (Plot size: 30 Ft radius			s? Status	Number of Dominant S			
1.				That Are OBL, FACW, (excluding FAC-):	or FAC (A)		
2					、,		
3		-		Total Number of Domi Species Across All Str	0		
4	0	= Total	Cover				
Sapling/Shrub Stratum (Plot size: 15 Ft radius)	rotar		Percent of Dominant S That Are OBL, FACW,			
1. Salix exigua	20	Υ	FACW	Prevalence Index wo	rkshoot:		
2					Multiply by:		
3				OBL species 25			
4					x 2 = 180		
5	00				x 3 =		
Herb Stratum (Plot size: 5 Ft radius)		= Total	Cover	FACU species			
1. Phragmites australis	70	Υ	FACW		x 5 =		
2. Typha angustifolia	25	Υ	OBL	Column Totals: 115	(A) <u>205</u> (B)		
3				Prevalence Inde	$x = R/\Delta = 1.78$		
4				Hydrophytic Vegetati			
5				X 1 - Rapid Test for	Hydrophytic Vegetation		
6				X 2 - Dominance Te	inants are FACW and/or OBL. St is >50%		
7				X 3 - Prevalence Inc			
8					Adaptations ¹ (Provide supporting		
9 10					(s or on a separate sheet)		
10.	0.5	= Total	Cover	Problematic Hydro	pphytic Vegetation ¹ (Explain)		
Woody Vine Stratum (Plot size:) 1				¹ Indicators of hydric so be present, unless dis	oil and wetland hydrology must turbed or problematic.		
2.				Hydrophytic	-		
_			Cover	Vegetation Present? You	es ^X No		
% Bare Ground in Herb Stratum 5 Remarks:	DE - EAC No	tral Tast for b	vdrology Drop all EAC		50% remaining are FACW to OBL, then YES to D5.		
	20 17/0/1600		,	S as out. Communa. II 2	3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		

(inches)	Matrix	0/		ox Feature		Loc ²	Taytura	Domorko			
(inches) 0-4	Color (moist) 10YR 4/2	<u>%</u> 98	Color (moist) 10YR 5/8	<u>%</u> 2	Type ¹ C	PL	Texture sandy clay	Remarks			
4-10	10YR 5/2	90	10YR 5/8	_ <u></u>	- C	PL/M					
	·		-				loamy sand				
10-12	10YR 4/1	80	5YR 4/6	20	<u>C</u>	М	loamy sand				
	<u> </u>										
			_								
			_								
¹ Type: C=C	Concentration, D=De	epletion, RI	M=Reduced Matrix, C	S=Covere	ed or Coate	ed Sand G		ion: PL=Pore Lining, M=Matrix.			
Hydric Soil	Indicators: (Appl	icable to a	III LRRs, unless othe	erwise no	ted.)		Indicators fo	r Problematic Hydric Soils ³ :			
Histoso			Sandy	Gleyed M	atrix (S4)			ck (A9) (LRR I, J)			
	Epipedon (A2) Histic (A3)		X Sandy	Redox (S ed Matrix (airie Redox (A16) (LRR F, G, H) face (S7) (LRR G)			
	en Sulfide (A4)				ineral (F1)			ns Depressions (F16)			
	ed Layers (A5) (LRF	RF)		Gleyed M			_	H outside of MLRA 72 & 73)			
	uck (A9) (LRR F, G			ed Matrix				Vertic (F18)			
	ed Below Dark Surfa	ace (A11)		Dark Surf	. ,			ent Material (TF2)			
	Park Surface (A12)			ed Dark S Depression	urface (F7)		llow Dark Surface (TF12)			
	Mucky Mineral (S1) Mucky Peat or Pea				ressions (F	16)	Other (Explain in Remarks) 3Indicators of hydrophytic vegetation and				
	lucky Peat or Peat (73 of LRF			ydrology must be present,			
	,		,			,		sturbed or problematic.			
Restrictive	Layer (if present):	:									
Type:											
Depth (ir	nches):						Hydric Soil Pi	resent? Yes <u>×</u> No			
	nches):		<u> </u>				Hydric Soil Pi	resent? Yes × No			
Depth (ir	nches):						Hydric Soil Pi	resent? Yes ^x No			
Depth (ir	nches):						Hydric Soil Pi	resent? Yes <u>×</u> No			
Depth (ir							Hydric Soil Pi	resent? Yes <u>×</u> No			
Depth (ir							Hydric Soil Pi	resent? Yes <u>×</u> No			
Depth (ir Remarks: YDROLO	OGY ydrology Indicator	s:	red; check all that app	oly)				resent? Yes X No No Indicators (minimum of two required			
Depth (in Remarks: YDROLO Wetland Hy Primary Ind	OGY ydrology Indicator	s:					Secondary				
Depth (ir Remarks: YDROLO Wetland Hy Primary Ind Surface High W	OGY ydrology Indicators icators (minimum of a Water (A1) //ater Table (A2)	s:	red; check all that app Salt Crus Aquatic Ii	it (B11) nvertebrat			Secondary Surfac	Indicators (minimum of two required			
Depth (ir Remarks: YDROLC Wetland Hy Primary Ind Surface High W X Saturat	OGY Idrology Indicators icators (minimum of Water (A1) Idrater Table (A2) ion (A3)	s:	red; check all that app Salt Crus Aquatic I Hydroger	st (B11) nvertebrat n Sulfide C	odor (C1)		Secondary Surface Sparse Draina	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10)			
Depth (ir Remarks: YDROLO Wetland Hy Primary Ind Surface High W X Saturat Water I	ydrology Indicators icators (minimum of wWater (A1) fater Table (A2) ion (A3) Warks (B1)	s:	red; check all that app Salt Crus Aquatic I Hydroger Dry-Seas	et (B11) nvertebrat n Sulfide C son Water	odor (C1) Table (C2)		Secondary Surfac Sparse Draina Oxidiz	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3			
Depth (in Remarks: YDROLO	ody ydrology Indicators icators (minimum of wWater (A1) fater Table (A2) ion (A3) Warks (B1) ent Deposits (B2)	s:	red; check all that app Salt Crus Aquatic li Hydroger Dry-Seas Oxidized	et (B11) nvertebrat n Sulfide C son Water Rhizosph	odor (C1) Table (C2) eres on Liv		Secondary Surface Sparse Draina Oxidiz (C3)	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 ere tilled)			
Depth (ir Remarks: YDROLO	ydrology Indicators icators (minimum of w Water (A1) fater Table (A2) ion (A3) Warks (B1) ent Deposits (B2) eposits (B3)	s:	red; check all that app Salt Crus Aquatic II Hydroger Dry-Seas Oxidized (where	ot (B11) nvertebrat n Sulfide Coon Water Rhizosphe not tilled	Odor (C1) Table (C2) eres on Liv)	ing Roots	Secondary Surface Sparse Draina Oxidize (C3) (whe	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 ere tilled) sh Burrows (C8)			
Depth (ir Remarks: YDROLO Wetland Hy Primary Ind Surface High W X Saturat Water N Sedime Drift De Algal M	ydrology Indicators icators (minimum of water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4)	s:	red; check all that app Salt Crus Aquatic II Hydroger Dry-Seas Oxidized (where	ot (B11) nvertebrat n Sulfide Coon Water Rhizosphe not tilled e of Reduce	Odor (C1) Table (C2) eres on Liv) ed Iron (C	ing Roots	Secondary Surface Sparse Draina Oxidiz (C3) (whe	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 ere tilled) sh Burrows (C8) tion Visible on Aerial Imagery (C9)			
Depth (ir Remarks: YDROLO Wetland Hy Primary Ind Surface High W X Saturat Water I Sedime Drift De Algal M Iron De	ody Identify and the control of the	s: f one requir	red; check all that app Salt Crus Aquatic li Hydroger Dry-Seas Oxidized (where Presence Thin Muc	ot (B11) Invertebrate In Sulfide Coon Water Rhizosphe In not tilled In of Reduce Rhizosphe In ot Sulface	Odor (C1) Table (C2) eres on Liv) ed Iron (C4) (C7)	ing Roots	Secondary Surface Sparse Draina Oxidiz (C3) (whe Crayfise Satura Geome	Indicators (minimum of two required e Soil Cracks (B6) By Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 ere tilled) sh Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2)			
Depth (ir Remarks: YDROLC Wetland Hy Surface High W X Saturat Water Sedime Drift De Iron De Inundat	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aeria	s: f one requii	red; check all that app Salt Crus Aquatic li Hydroger Dry-Seas Oxidized (where Presence Thin Muc	ot (B11) Invertebrate In Sulfide Coon Water Rhizosphe In not tilled In of Reduce Rhizosphe In ot Sulface	Odor (C1) Table (C2) eres on Liv) ed Iron (C4) (C7)	ing Roots	Secondary Surface Sparse Draina Oxidiz (C3) (whe Crayfis Satura Geome	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 ere tilled) en Burrows (C8) tion Visible on Aerial Imagery (C9)			
Depth (ir Remarks: YDROLC Wetland Hy Surface High W X Saturat Water Sedime Drift De Iron De Inundat	ydrology Indicators icators (minimum of w Water (A1) fater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9	s: f one requii	red; check all that app Salt Crus Aquatic li Hydroger Dry-Seas Oxidized (where Presence Thin Muc	ot (B11) Invertebrate In Sulfide Coon Water Rhizosphe In not tilled In of Reduce Rhizosphe In ot Sulface	Odor (C1) Table (C2) eres on Liv) ed Iron (C4) (C7)	ing Roots	Secondary Surface Sparse Draina Oxidiz (C3) (whe Crayfis Satura Geome	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 ere tilled) et Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2) leutral Test (D5)			
Depth (ir Remarks: YDROLO Wetland Hy Primary Ind Surface High W X Saturat Water N Sedime Drift De Algal M Iron De Inundat Water-S Field Obse	ydrology Indicators icators (minimum of w Water (A1) dater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9	s: f one requir al Imagery (red; check all that app Salt Crus Aquatic li Hydroger Dry-Seas Oxidized (where Presence Thin Muc	ot (B11) Invertebrat In Sulfide Coon Water Rhizospho In not tilled In of Reduce Reduce of Reduce of Reduce Reduce of Reduce of Reduce Reduce of	Odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7) emarks)	ing Roots	Secondary Surface Sparse Draina Oxidiz (C3) (whe Crayfis Satura Geome	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 ere tilled) eth Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2) leutral Test (D5)			
Depth (ir Remarks: YDROLO Wetland Hy Primary Ind Surface High W X Saturat Water N Sedime Drift De Algal M Iron De Inundat Water-S Field Obse	ydrology Indicators icators (minimum of water (A1) dater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9 rvations: iter Present?	s: f one requir I Imagery ()	red; check all that app Salt Crus Aquatic II Hydroger Dry-Seas Oxidized (where Presence Thin Muc	st (B11) nvertebrat n Sulfide C son Water Rhizosph not tilled e of Reduc sk Surface kplain in R	Odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7) emarks)	ing Roots	Secondary Surface Sparse Draina Oxidiz (C3) (whe Crayfis Satura Geome	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 ere tilled) eth Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2) leutral Test (D5)			
Depth (ir Remarks: YDROLC Wetland Hy Primary Ind Surface High W X Saturat Water Sedime Drift De Inundar Water - Sedime Iron De Inundar Water - Sedime Water - Sedime Sedime Sedime Drift De Sedime S	ydrology Indicators icators (minimum of wwater (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9 rvations: leter Present? Present?	s: f one requir al Imagery () Yes	red; check all that app Salt Crus Aquatic II Hydroger Dry-Seas Oxidized (where Presence Thin Muc (B7) Other (Ex	st (B11) nvertebrat n Sulfide C son Water Rhizosph not tilled e of Reduc k Surface k plain in R nches):	Odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7) emarks)	ing Roots	Secondary Surface Sparse Draina Oxidiz (C3) (whe Crayfis Satura Geome	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Care tilled) eth Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2) leutral Test (D5) Heave Hummocks (D7) (LRR F)			
Depth (in Remarks: YDROLO	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9 rvations: ter Present? e Present? epillary fringe)	s: f one requir I Imagery () Yes Yes _X Yes _X	red; check all that approximate solutions and the second solutions are solutions. The second solutions are solutions and the second solutions are solutions and the second solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutinto a solution are solutions are solutions. The second solutions	st (B11) nvertebrat n Sulfide C son Water Rhizosphe not tilled e of Reduce k Surface k plain in R nches):	Odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7) emarks)	ing Roots 4) Wet	Secondary Surface Sparse Draina Oxidize (C3) (whee Satura Geome FAC-N Frost-N	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Care tilled) eth Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2) leutral Test (D5) Heave Hummocks (D7) (LRR F)			
Depth (in Remarks: YDROLO	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9 rvations: ter Present? e Present? epillary fringe)	s: f one requir I Imagery () Yes Yes _X Yes _X	red; check all that approximate and selection of the control of th	st (B11) nvertebrat n Sulfide C son Water Rhizosphe not tilled e of Reduce k Surface k plain in R nches):	Odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7) emarks)	ing Roots 4) Wet	Secondary Surface Sparse Draina Oxidize (C3) (whee Satura Geome FAC-N Frost-N	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Care tilled) eth Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2) leutral Test (D5) Heave Hummocks (D7) (LRR F)			
Depth (in Remarks: YDROLO	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9 rvations: ter Present? e Present? epillary fringe)	s: f one requir I Imagery () Yes Yes _X Yes _X	red; check all that approximate solutions and the second solutions are solutions. The second solutions are solutions and the second solutions are solutions and the second solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutions are solutions are solutions are solutions. The second solutions are solutinto a solution are solutions are solutions. The second solutions	st (B11) nvertebrat n Sulfide C son Water Rhizosphe not tilled e of Reduce k Surface k plain in R nches):	Odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7) emarks)	ing Roots 4) Wet	Secondary Surface Sparse Draina Oxidize (C3) (whee Satura Geome FAC-N Frost-N	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 ere tilled) eth Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2) leutral Test (D5)			

Project/Site: US 287 Lamar Bypass	(City/Co	ounty:	Prowers C	County Sampling Date: 10-23-12				2
Applicant/Owner: CDOT		_			State: CO Sampling Point: SP-5				
Investigator(s): T. Demasters, E. Weber	Section, Township, Range: Section 28, Township 22 S, Range 46 W								
					convex, none): C				1
	Lat: 38.1	08190	0155	•	Long: 38.10819	90155	 D	atum: NAI) 83
Soil Map Unit Name: Lincoln sand					NWI				
Are climatic / hydrologic conditions on the site typical for									
Are Vegetation, Soil, or Hydrology					Normal Circumst			x No	0
Are Vegetation, Soil, or Hydrology					eded, explain an	•			
SUMMARY OF FINDINGS – Attach site ma									s, etc.
Hydrophytic Vegetation Present? Yes	No X		la 4la		A				
Hydric Soil Present? Yes	No x			e Sampled n a Wetlar		es	No X		
Wetland Hydrology Present? Yes	No <u>x</u>		WILLIII	ii a vvetiai	id:				
*Extreme drought conditions (droughtmonitor.unl. Upland pit near small pond; soil representative of VEGETATION – Use scientific names of plants o	area north ar	nd so	uth of	Arkansas	s River. Same s	soil unit for b	oth.		
00.51	Absolute				Dominance Te	st worksheet	t:		
Tree Stratum (Plot size: 30 Ft radius	% Cover				Number of Don				
1					That Are OBL, (excluding FAC		C 0		(A)
2					,	ŕ			()
3					Total Number of Species Across		1		(B)
	0				Percent of Don	ninant Snacies	2		
Sapling/Shrub Stratum (Plot size: 15 Ft radius)					That Are OBL,		C: 0		(A/B)
1					Prevalence Inc	dex workshee	et:		
2						over of:		Itiply by:	
3					OBL species				
4. 5.					FACW species		x 2 = _		_
<u> </u>	0	= Tota	al Cov	er	FAC species	-	x 3 = _		_
Herb Stratum (Plot size: 5 Ft radius)					FACU species	-	_		_
1. Bassia scoparia	55	Y		UPL	UPL species	100	x 5 = 5		_
2. Sporobolus cryptandrus	45	Υ		UPL	Column Totals:	100	(A) <u></u>	500	_ (B)
3					Prevalend	ce Index = B//	A = 5.00)	
4					Hydrophytic V	egetation Inc	dicators:		
5 6					1 - Rapid 1	est for Hydro	phytic Ve	getation	
7					2 - Domina				
8.					3 - Prevale				
9.						logical Adapta Remarks or o			
10					Problemati			,	
	100	= Tota	al Cov	er			_		
Woody Vine Stratum (Plot size:) 1					¹Indicators of h be present, unl				nust
2					Hydrophytic				
% Bare Ground in Herb Stratum 0		= Tota	al Cov	er	Vegetation Present?	Yes	No	, x	
Remarks:	D5 - FAC Neut	ral Test fo	or hydrolog	ov. Drop all FAC	cross examine all other dor				YES to D5
								,	-

	cription: (Describe	to the depth				or confirr	n the absence	of indicators.)			
Depth (inches)	Matrix Color (moist)	%	Color (moist)	ox Feature: %	s Type ¹	Loc ²	Texture	Remarks			
0-18	2.5Y 5/3	100	,				loamy sand	No redox features			
-											
	<u> </u>										
				_							
	· ·						·				
-											
1- 0.0							. 2.				
•	Concentration, D=De Indicators: (Appli					ed Sand G		cation: PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ :			
Histoso		cable to all Li	Sandy					Muck (A9) (LRR I, J)			
	Epipedon (A2)		Sandy					Prairie Redox (A16) (LRR F, G, H)			
	listic (A3)			d Matrix (S				Surface (S7) (LRR G)			
Hydrog	en Sulfide (A4)		Loamy	Mucky Mir	neral (F1)			Plains Depressions (F16)			
	ed Layers (A5) (LRR		Loamy	Gleyed Ma	atrix (F2)		(LR	RR H outside of MLRA 72 & 73)			
	uck (A9) (LRR F, G,			ed Matrix (I	,			ed Vertic (F18)			
	ed Below Dark Surfa	ce (A11)		Dark Surfa	. ,			arent Material (TF2)			
	Park Surface (A12) Mucky Mineral (S1)			ed Dark Su Depression)		hallow Dark Surface (TF12) (Explain in Remarks)			
	Mucky Peat or Peat	(S2) (LRR G .		ains Depre	` '	16)		of hydrophytic vegetation and			
	ucky Peat or Peat (S			RA 72 & 7				d hydrology must be present,			
							unless	disturbed or problematic.			
Restrictive	Layer (if present):										
Type:			_								
Depth (ir	nches):						Hydric Soil	Present? Yes No x			
Remarks:											
Soil dry and	d dusty.										
HYDROLO	OGY										
Wetland Hy	drology Indicators	:									
Primary Indi	icators (minimum of	one required;	check all that app	ly)			Seconda	ary Indicators (minimum of two required)			
Surface	e Water (A1)		Salt Crust	(B11)			Surf	face Soil Cracks (B6)			
High W	ater Table (A2)		Aquatic Ir	vertebrate	s (B13)		Sparsely Vegetated Concave Surface (B8)				
Saturat	ion (A3)		Hydrogen	Sulfide O	dor (C1)		Drainage Patterns (B10)				
Water N	Marks (B1)		Dry-Seas	on Water T	Table (C2)		Oxid	dized Rhizospheres on Living Roots (C3)			
	ent Deposits (B2)		Oxidized			ing Roots	. ,	here tilled)			
· — ·	eposits (B3)		•	not tilled)				yfish Burrows (C8)			
	lat or Crust (B4)		Presence		,	4)		uration Visible on Aerial Imagery (C9)			
	posits (B5)	. (5-)	Thin Mucl					emorphic Position (D2)			
	tion Visible on Aerial		Other (Ex	plain in Re	emarks)			C-Neutral Test (D5)			
	Stained Leaves (B9)						Fros	st-Heave Hummocks (D7) (LRR F)			
Field Obse		V *!	Dente C	-h\							
			Depth (ir								
Water Table			Depth (ir				Laure 1 12 - 1 - 1				
Saturation F (includes ca	Present? apillary fringe)	Yes No	Depth (ir	iches):		Wet	iand Hydrolog	y Present? Yes No X			
Describe Re	ecorded Data (strear	n gauge, moni	toring well, aerial	photos, pr	evious ins	pections),	, if available:				
Dagger											
Remarks:	aio indiasta ==										
INO NYOFOIO	gic indicators.										

Project/Site: US 287 Lamar Bypass		City/Cou	nty: Prowers C	County	Sampling Date: 10-24-12
Applicant/Owner: CDOT	_			State: CO	Sampling Point: SP-6
Investigator(s): T. Demasters, E. Weber		Section,	Township, Rai	nge: Section 33, Townsh	nip 22 South, Range 46 West
					Slope (%): 0
Subregion (LRR): G- Western Great Plains	Lat: 38.0	9114800	066	Long: -102.579711165	Datum: NAD 83
Soil Map Unit Name: Tivoli sand				NWI classifi	
Are climatic / hydrologic conditions on the site typical for this					
Are Vegetation, Soil, or Hydrologys					
Are Vegetation, Soil, or Hydrology r	naturally pro	blematic	? (If ne	eeded, explain any answe	ers in Remarks.)
SUMMARY OF FINDINGS – Attach site map	showing	samp	ling point le	ocations, transects	s, important features, etc.
Hydrophytic Vegetation Present? Yes X Hydric Soil Present? Yes X N			s the Sampled		No
Wetland Hydrology Present? Yes X N Remarks:	lo				
*Extreme drought conditions (droughtmonitor.unl.ed Sampling Point completed on a small terrace within VEGETATION – Use scientific names of plan	Willow Cre	eek app	roximately 6	inches above the water	er level.
	Absolute	Domina	ant Indicator	Dominance Test work	ksheet:
Tree Stratum (Plot size: 30 Ft radius) 1				Number of Dominant S That Are OBL, FACW, (excluding FAC-):	
2				Total Number of Domin Species Across All Stra	nant
Sapling/Shrub Stratum (Plot size: 15 Ft radius)		= Total	Cover	Percent of Dominant S	
1. Ulmus pumila	trace	Υ	UPL	That Are OBL, FACW,	or FAC: 100 (A/B)
2				Prevalence Index wo	
3.					Multiply by:
4					x 1 = <u>1</u>
5				FACW species	x 2 =
Herb Stratum (Plot size: 5 Ft radius)	0	= Total	Cover	FACU species	
1 Echinochloa crus-galli	97	Υ	FAC		x 5 =
2. Rumex crispus	2	N	FAC	Column Totals: 100	
3. Juncus arcticus	1	N	OBL		
4				Prevalence Index	· · · · · · · · · · · · · · · · · · ·
5				Hydrophytic Vegetati	ion Indicators: Hydrophytic Vegetation
6				X 2 - Dominance Te	inante are EACW and/or OBI
7				X 3 - Prevalence Ind	
8				4 - Morphological	Adaptations ¹ (Provide supporting
9					ks or on a separate sheet)
10.	400	= Total (Cover	Problematic Hydro	ophytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size:) 1				¹ Indicators of hydric so be present, unless dist	oil and wetland hydrology must turbed or problematic.
2 % Bare Ground in Herb Stratum 0		= Total		Hydrophytic Vegetation Present? Ye	es <u>×</u> No
Remarks:	D5 - FAC Neut	tral Test for hy	ydrology. Drop all FAC,	cross examine all other dominants. If >	50% remaining are FACW to OBL, then YES to D5.
Fringe ranges from 3 to 25 feet wide.					

Profile Desc	ription: (Describe	to the depth	needed to docum	nent the i	ndicator	or confirr	m the absence	of indicators.)			
Depth Matrix (inches) Color (moist) %				x Feature	-	. 2					
(inches)	Color (moist)	70 10	Color (moist)	<u>%</u>	Type'	Loc ²	Texture loamy and	Remarks Paday factures present			
0-16	10YR 4/1	70 10	OYR 5/8	30	<u>C</u>	M	loamy sand	Redox features present			
	-						<u> </u>				
	-										
				-							
•	oncentration, D=Dep					ed Sand G		eation: PL=Pore Lining, M=Matrix.			
_	ndicators: (Applic	cable to all LR						for Problematic Hydric Soils ³ :			
Histosol	` '		Sandy C					Muck (A9) (LRR I, J) Prairie Redox (A16) (LRR F, G, H)			
Black His	oipedon (A2)		Sandy F	kedox (So I Matrix (S				urface (S7) (LRR G)			
	n Sulfide (A4)			Mucky Mir				lains Depressions (F16)			
	Layers (A5) (LRR	F)		Gleyed Ma			_	R H outside of MLRA 72 & 73)			
	ck (A9) (LRR F, G ,			d Matrix (`	ed Vertic (F18)			
Depleted	d Below Dark Surfac	ce (A11)	Redox [Dark Surfa	ace (F6)		Red Pa	arent Material (TF2)			
	ark Surface (A12)				ırface (F7)		hallow Dark Surface (TF12)			
	lucky Mineral (S1)	(00) (1 0 -		Depressio		40)		(Explain in Remarks)			
	Mucky Peat or Peat				essions (F			of hydrophytic vegetation and			
5 cm iviu	cky Peat or Peat (S	(LKK F)	(IVIL	KA /2 &	73 of LRF	(H)		d hydrology must be present, disturbed or problematic.			
Restrictive L	_ayer (if present):						unicss	disturbed of problematic.			
Type:	,										
, <u> </u>	ches):		_				Hydric Soil	Present? Yes X No			
Remarks:											
Very homog	enous throughou	t the soil prof	ile. Sand becon	nes coar	ser after	8 inches	below ground	surface.			
	OV.										
HYDROLO											
_	drology Indicators:										
	ators (minimum of o	one required; c				-		ry Indicators (minimum of two required)			
Surface			Salt Crust		(5.10)			ace Soil Cracks (B6)			
	iter Table (A2)		Aquatic Inv				Sparsely Vegetated Concave Surface (B8)				
X Saturation	, ,		Hydrogen					nage Patterns (B10)			
	arks (B1)		Dry-Seaso				· · · · · · · · · · · · · · · · · · ·	lized Rhizospheres on Living Roots (C3)			
	nt Deposits (B2)		Oxidized F			ing Roots	. ,	there tilled)			
X Drift Dep	it or Crust (B4)		•	not tilled)		1)		/fish Burrows (C8)			
	osits (B5)		Presence of Thin Muck		,	+)		ration Visible on Aerial Imagery (C9) morphic Position (D2)			
-	on Visible on Aerial	Imagery (R7)	Other (Exp		,		·	:-Neutral Test (D5)			
	tained Leaves (B9)	illiagery (D7)	Other (Exp	naiii iii ixe	illaiks)			st-Heave Hummocks (D7) (LRR F)			
Field Observ	. ,							(2.7)			
Surface Water		es No	X Depth (inc	ches):							
Water Table			Depth (inc			_					
Saturation Pr			Depth (inc		surface	Wet	land Hydrolog	y Present? Yes × No No			
(includes cap	oillary fringe)							,			
Describe Red	corded Data (stream	n gauge, monit	oring well, aerial p	ohotos, pr	evious ins	pections),	, if available:				
Remarks:											

Project/Site: US 287 Lamar Bypass	(City/Co	ounty:	Prowers C	County	Samplin	g Date: 1	0-23-12
Applicant/Owner: CDOT					State: CO			
					nge: Section 33, Towns			
					convex, none): Concav			
					Long: -102.57974823			
Soil Map Unit Name: Tivoli sand					NWI classi			
Are climatic / hydrologic conditions on the site typical for this								
Are Vegetation, Soil, or Hydrologys								No
Are Vegetation, Soil, or Hydrology r					eded, explain any ansv			
SUMMARY OF FINDINGS – Attach site map				,			,	itures, etc.
Hydrophytic Vegetation Present? Yes N	lo X							
Hydric Soil Present? Yes N				Sampled		N	Y	
Wetland Hydrology Present? Yes N Remarks:			withi	n a Wetlan	id? fes	No		
*Extreme drought conditions (droughtmonitor.unl.ed Upland pit adjacent to Willow Creek. On top of hill by	y channeliz	zed cre	eek.					
VEGETATION – Use scientific names of plan		Domi	nont	Indicator	Dominance Test wo	rkobooti		
Tree Stratum (Plot size: 30 Ft radius)	Absolute % Cover				Number of Dominant			
1					That Are OBL, FACW	•	1	(4)
2					(excluding FAC-):		-	(A)
3					Total Number of Dom		2	(B)
4					Species Across All St	iala.		(D)
Sapling/Shrub Stratum (Plot size: 15 Ft radius)	0		I Cov	er	Percent of Dominant That Are OBL, FACW		50	(A/B)
1 2					Prevalence Index we	orksheet:		
3.					Total % Cover of			
4.					OBL species			
5					FACW species			
5 Et radius	0	= Tota	I Cov	er	FACULARISIS 40			
Herb Stratum (Plot size: 5 Ft radius 1. Bromus ciliates	40	Υ		FAC	FACU species 60		5 = 300	
2 Lepidium densiflorum	60	<u>Y</u>		UPL	Column Totals: 100		·	(B)
3.								(5)
4					Prevalence Inde			
5.					Hydrophytic Vegeta			
6					1 - Rapid Test for 2 - Dominance T		-// ODI	tion
7					3 - Prevalence In			
8					4 - Morphologica			
9					data in Rema			•
10.	400	= Tota		er	Problematic Hydi	ophytic Ve	getation* (Explain)
Woody Vine Stratum (Plot size:) 1					¹ Indicators of hydric s be present, unless dis			
2.					Hydrophytic			
% Bare Ground in Herb Stratum 0		= Tota	I Cov	er	Vegetation Present?	'es	No X	
Remarks:	D5 - FAC Neut	ral Test for	r hydrolog	gy. Drop all FAC,	cross examine all other dominants. If	> 50% remaining	are FACW to O	BL, then YES to D5.
Mowed, dormant vegetation.								

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

(inches)	Color (moist)	%	Color (moist) % Type ¹	Loc ²	Texture	Remarks		
0-7	10YR 4/3	100				No redox features		
7-12	10 YR 3/4	100				No redox features		
								
			Reduced Matrix, CS=Covered or Coated S	Sand Grai		cation: PL=Pore Lining, M=Matrix.		
Hydric Soil I	Indicators: (Appli	cable to all L	RRs, unless otherwise noted.)		Indicators	for Problematic Hydric Soils ³ :		
Histosol	(A1)		Sandy Gleyed Matrix (S4)		1 cm N	Muck (A9) (LRR I, J)		
	oipedon (A2)		Sandy Redox (S5)			Prairie Redox (A16) (LRR F, G, H)		
Black Hi			Stripped Matrix (S6)			Surface (S7) (LRR G)		
	en Sulfide (A4)	-\	Loamy Mucky Mineral (F1)			Plains Depressions (F16)		
· 	d Layers (A5) (LRR	•	Loamy Gleyed Matrix (F2)		•	RR H outside of MLRA 72 & 73)		
	ick (A9) (LRR F, G d Below Dark Surfa		Depleted Matrix (F3)Redox Dark Surface (F6)			ed Vertic (F18) arent Material (TF2)		
	ark Surface (A12)	ice (ATT)	Nedox Dark Surface (F6) Depleted Dark Surface (F7)			Shallow Dark Surface (TF12)		
	fucky Mineral (S1)		Redox Depressions (F8)			(Explain in Remarks)		
	Mucky Peat or Peat	(S2) (LRR G)		of hydrophytic vegetation and		
	ıcky Peat or Peat ((MLRA 72 & 73 of LRR H			d hydrology must be present,		
					unless disturbed or problematic.			
Restrictive I	Layer (if present):							
Type:								
Depth (inc	ches):		<u></u>		Hydric Soil	Present? Yes No _X		
Remarks:				Į.				
Probable fill	, next to channel	ized creek.						
HYDROLO	GY							
Wetland Hyd	drology Indicators	3 :						
Primary Indic	cators (minimum of	one required;	check all that apply)		Seconda	ary Indicators (minimum of two required)		
Surface	Water (A1)		Salt Crust (B11)		Surf	face Soil Cracks (B6)		
High Wa	ater Table (A2)		Aquatic Invertebrates (B13)		Sparsely Vegetated Concave Surface (B8)			
Saturatio	on (A3)		Hydrogen Sulfide Odor (C1)		Drainage Patterns (B10)			
Water M	larks (B1)		Dry-Season Water Table (C2)		Oxidized Rhizospheres on Living Roots (C3)			
Sedimer	nt Deposits (B2)		Oxidized Rhizospheres on Living	Roots (C	(w	vhere tilled)		
Drift Dep	oosits (B3)		(where not tilled)		Cray	yfish Burrows (C8)		
Algal Ma	at or Crust (B4)		Presence of Reduced Iron (C4)		Satu	uration Visible on Aerial Imagery (C9)		
Iron Dep	osits (B5)		Thin Muck Surface (C7)		Geo	omorphic Position (D2)		
Inundation	\ /:-: -	I Imagery (B7)	Other (Explain in Remarks)		FAC	C-Neutral Test (D5)		
	on Visible on Aeria	i illiagory (Br)			_			
Water-S	on visible on Aeria tained Leaves (B9)	0,1			Fros	st-Heave Hummocks (D7) (LRR F)		
Water-S	tained Leaves (B9)	0,1		<u> </u>	Fros	st-Heave Hummocks (D7) (LRR F)		
	tained Leaves (B9) vations:		o X Depth (inches):		Fros	st-Heave Hummocks (D7) (LRR F)		
Field Observ	tained Leaves (B9) vations: er Present?	Yes N	D X Depth (inches): D X Depth (inches):		Fros	st-Heave Hummocks (D7) (LRR F)		
Field Observ	tained Leaves (B9) vations: er Present? Present?	Yes N Yes N	Depth (inches):	Wetlar		y Present? Yes No x		
Field Observ Surface Water Water Table Saturation Pro (includes cap	tained Leaves (B9) vations: er Present? Present? resent? oillary fringe)	Yes N Yes N Yes N	Depth (inches): Depth (inches):		nd Hydrolog			
Field Observ Surface Water Water Table Saturation Pro (includes cap	tained Leaves (B9) vations: er Present? Present? resent? oillary fringe)	Yes N Yes N Yes N	Depth (inches):		nd Hydrolog			
Field Observ Surface Water Water Table Saturation Pro (includes cap	tained Leaves (B9) vations: er Present? Present? resent? oillary fringe)	Yes N Yes N Yes N	Depth (inches): Depth (inches):		nd Hydrolog			
Field Observ Surface Water Water Table Saturation Pro (includes cap	tained Leaves (B9) vations: er Present? Present? resent? oillary fringe)	Yes N Yes N Yes N	Depth (inches): Depth (inches):		nd Hydrolog			
Field Observ Surface Water Water Table Saturation Pro (includes cap Describe Rec	tained Leaves (B9) vations: er Present? Present? resent? oillary fringe)	Yes N Yes N Yes N	Depth (inches): Depth (inches):		nd Hydrolog			
Field Obsert Surface Water Water Table Saturation Pro (includes cap Describe Rec	tained Leaves (B9) vations: er Present? Present? resent? oillary fringe)	Yes N Yes N Yes N	Depth (inches): Depth (inches):		nd Hydrolog			
Field Observ Surface Water Water Table Saturation Pro (includes cap Describe Rec	tained Leaves (B9) vations: er Present? Present? resent? oillary fringe)	Yes N Yes N Yes N	Depth (inches): Depth (inches):		nd Hydrolog			

Project/Site: US 287 Lamar Bypass		City/Cou	unty: Prowers (County	_ Sampling Date: <u>12/10/12</u>
Applicant/Owner: CDOT				State: CO	
Investigator(s): T. Demasters,					nip 22 South, Range 46 West
Landform (hillslope, terrace, etc.): Depositional/Erosio					
Subregion (LRR): G- Western Great Plains					
Soil Map Unit Name: Rocky Ford Clay Loam, 0-1 % SI	lopes			NWI classifi	cation: PEMC
Are climatic / hydrologic conditions on the site typical					
Are Vegetation, Soil, or Hydrology					present? Yes X No
Are Vegetation, Soil, or Hydrology				eeded, explain any answ	
SUMMARY OF FINDINGS – Attach site r	map showing	samp	oling point l	ocations, transect	s, important features, etc.
Hydrophytic Vegetation Present? Yes X	No		a tha Camaniad	I Avec	
Hydric Soil Present? Yes x	No		s the Sampled within a Wetlar		No
Wetland Hydrology Present? Yes X	No	•	vitilli a vvetiai	id: les	
Remarks:					
*Extreme drought conditions (droughtmonitor.u Sampling Point completed on a small shelf with wetland shelf, common in the straight sections,	nin Markham Ar				ter level. North side of 300'
VEGETATION – Use scientific names of					
	Absolute	Domin	nant Indicator	Dominance Test wor	ksheet:
Tree Stratum (Plot size: 30 Ft radius)	% Cover	Specie	es? Status	Number of Dominant S	Species
1				That Are OBL, FACW, (excluding FAC-):	or FAC (A)
2				(excluding 1 AO).	(^/\)
3		-		Total Number of Domi Species Across All Str	0
4	0		0		
Sapling/Shrub Stratum (Plot size: 15 Ft radius	_)	= rotar	Cover	Percent of Dominant S That Are OBL, FACW,	
1					
2				Prevalence Index wo	
3				Total % Cover of: OBL species 15	<u>Multiply by:</u> x 1 = <u>15</u>
4					$x = \frac{10}{20}$
5					x 3 = 120
Herb Stratum (Plot size: 5 Ft radius)		= Total	Cover		x 4 = 140
1. Chenopodium album	35	Υ	FACU		x 5 =
2. Rumex crispus	40	Υ	FAC	Column Totals: 100	
3. Juncus arcticus	10	N	FACW		
4. Schoenoplectus pungens	15	N	OBL	Prevalence Inde	<u> </u>
5				Hydrophytic Vegetat	
6				1 - Rapid Test for 2 - Dominance Te	Hydrophytic Vegetation
7				X 3 - Prevalence Inc	
8				1 	Adaptations ¹ (Provide supporting
9					ks or on a separate sheet)
10				Problematic Hydro	ophytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size:)	100	= Total	Cover	¹ Indicators of hydric so	oil and wetland hydrology must
1				be present, unless dis	turbed or problematic.
2				Hydrophytic	
0/ Page Crawed in Harb Charters 0		= Total	Cover	Vegetation Present? Yes	es ^X No
% Bare Ground in Herb Stratum 0 Remarks:	D5 - EAC North	tral Teet for h	avdrology Drop all EAC		50% remaining are FACW to OBL, then YES to D5.
Tomano.	Do - FAC Neut	uai i est loi f	тучтогоду. Бтор ан РАС,	, cross examine all other dominants. If >	- 50% remaining are FACVV to ODL, then TES to DS.

Profile Des	cription: (Descril	be to the de	oth needed to docu	ment the	indicator	or confir	m the absence	of indicators.)			
Depth	Matrix	(Rede	ox Featur	es		_				
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks			
0-9	10YR 5/2	90	10YR 5/1	_ 2	_ <u>D</u>	М	silty clay				
			10YR 5/8	8	С	М	sand				
9-16	10YR 6/3	90	10YR 5/8	3 10 C M sand with small gravels							
	-		-								
	-										
			=Reduced Matrix, C			ed Sand C		cation: PL=Pore Lining, M=Matrix.			
_		licable to all	LRRs, unless other					for Problematic Hydric Soils ³ :			
Histosol	,		Sandy					Muck (A9) (LRR I, J) Prairie Redox (A16) (LRR F, G, H)			
	Histic Epipedon (A2) Sandy Redox (S5) Black Histic (A3) Stripped Matrix (S6)							Surface (S7) (LRR G)			
	en Sulfide (A4)				lineral (F1)			Plains Depressions (F16)			
	d Layers (A5) (LR	R F)	Loamy	-	/atrix (F2)		-	RR H outside of MLRA 72 & 73)			
·	uck (A9) (LRR F, (. ,		ed Matrix	. ,			ed Vertic (F18)			
	d Below Dark Surf			Dark Sur				arent Material (TF2)			
	ark Surface (A12) Mucky Mineral (S1			ed Dark S Depressi	Surface (F7)		Shallow Dark Surface (TF12) (Explain in Remarks)			
	Mucky Peat or Pea				ressions (F	16)		of hydrophytic vegetation and			
	ucky Peat or Peat				73 of LRF			d hydrology must be present,			
							unless	disturbed or problematic.			
Restrictive	Layer (if present)):									
Type:											
Depth (in	ches):						Hydric Soil	Present? Yes X No No			
Remarks:											
Redox in sa	and layer at junc	tion betwee	n two horizons mo	ostly.							
HYDROLO	GY										
Wetland Hy	drology Indicato	rs:									
_			d; check all that app	oly)			Seconda	ary Indicators (minimum of two required)			
Surface	Water (A1)	-	Salt Crus	t (B11)			Sur	face Soil Cracks (B6)			
	ater Table (A2)		Aquatic Ir		es (B13)		Sparsely Vegetated Concave Surface (B8)				
X Saturati	on (A3)		Hydrogen	Sulfide (Odor (C1)		X Dra	inage Patterns (B10)			
Water N	/larks (B1)		Dry-Seas	on Water	Table (C2)	Oxio	dized Rhizospheres on Living Roots (C3)			
	nt Deposits (B2)		Oxidized	Rhizosph	eres on Liv	ing Roots	s (C3) (w	vhere tilled)			
Drift De			,	not tilled	,			yfish Burrows (C8)			
	at or Crust (B4)		Presence		•	4)		uration Visible on Aerial Imagery (C9)			
Iron De		- I I / - / - / - / - / -	Thin Muc					omorphic Position (D2)			
·	ion Visible on Aeri Stained Leaves (B9		37) Other (Ex	piain in R	(emarks)		· <u></u>	C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)			
Field Obser	•	9)					110:	SETTERAVE FIGHTHIOCKS (DT) (ERR F)			
Surface Wat		Vas	No X Depth (ir	nches).							
Water Table			No Depth (ir			_					
Saturation P			No Depth (ir			Wes	tland Hydrolog	y Present? Yes × No			
(includes ca	pillary fringe)							y resent: res			
Describe Re	ecorded Data (stream	am gauge, m	onitoring well, aerial	photos, p	previous in	spections)), if available:				
Remarks:		_									
consistent	slope away from	n water; hyd	rology falls out are	ound 8' v	vidth towa	ırds bank	K.				
1											

Project/Site: US 287 Lamar Bypass		City/Co	ounty: F	Prowers C	County	_ Sampling Date: 12/10/12	
Applicant/Owner: CDOT					State: CO	_ Sampling Point: SP-9	
Investigator(s): _T. Demasters,		Section	n, Town	ship, Ra	nge: Section 20, Towns	hip 22 South, Range 46 West	
						Slope (%): 20	
Subregion (LRR): G- Western Great Plains							-
Soil Map Unit Name: Rocky Ford Clay Loam, 0-1 % Slope:					NWI classif		
Are climatic / hydrologic conditions on the site typical for the							
Are Vegetation, Soil, or Hydrology						present? Yes x No	
Are Vegetation, Soil, or Hydrology					eded, explain any answ		
SUMMARY OF FINDINGS – Attach site map				,		ŕ	tc.
Hydrophytic Vegetation Present? Yes	No ^X		1- 41- 4				
Hydric Soil Present? Yes				Sampled a Wetlar		No _X	
Wetland Hydrology Present? Yes	No <u>x</u>		within	a wellai	iu: 165		
Remarks:							
*Extreme drought conditions (droughtmonitor.unl.e Sampling Point in Markham Arroyo. VEGETATION – Use scientific names of pla							
20 54	Absolute		inant In		Dominance Test wor	ksheet:	
Tree Stratum (Plot size: 30 Ft radius)	% Cover			Status_	Number of Dominant		
1					That Are OBL, FACW (excluding FAC-):	, or FAC (A)	,
2.						,	
3 4					Total Number of Dom Species Across All St	2	
	0	= Tota	al Cover				
Sapling/Shrub Stratum (Plot size: 15 Ft radius)		1010	ai 0010i		Percent of Dominant S That Are OBL, FACW		В)
1. Crataegus spp.	15			IPL	Prevalence Index wo	arkshoot:	
2					Total % Cover of:		
3						x 1 =	
4						x 2 =	
5						x 3 = 15	
Herb Stratum (Plot size: 5 Ft radius		- 10ta	al Cover		FACU species 7		
1. Kochia scoparia	20	Υ	<u></u>	IPL	UPL species 23	x 5 = 115	
2. Asclepias speciosa	5	Υ	<u>F</u>	AC	Column Totals: 35	(A) <u>158</u> (B	;)
3. Sorghum halepense		Υ		ACU	Prevalence Inde	ex = B/A = 4.71	
4. Helianthus pumilus	3	N		IPL	Hydrophytic Vegetat		
5						· Hydrophytic Vegetation	
6		-			2 - Dominance Te	ninants are FACW and/or OBL.	
7					3 - Prevalence In		
8					4 - Morphological	Adaptations ¹ (Provide supporting	ng
9 10.						ks or on a separate sheet)	
10.	25	= Tota	al Cover		Problematic Hydr	ophytic Vegetation ¹ (Explain)	
Woody Vine Stratum (Plot size:) 1.						oil and wetland hydrology must sturbed or problematic.	
2.					Hydrophytic		
% Bare Ground in Herb Stratum 50			al Cover		Vegetation Present? Y	es No_X	
Remarks:	D5 - FAC Neur	tral Test for	or hydrology	Drop all FAC:	1	> 50% remaining are FACW to OBL, then YES to D	D5.
			57	.,			

SOIL

Sampling Point: SP-9

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

Depth	Matrix		_		x Features	1 2		
(inches)	Color (moist)	%	Cold	or (moist)	<u>%</u> <u>Typ</u>	e ¹ Loc ²	Texture	Remarks
0-10	10YR 5/3	100						
								_
	-							
	-							
	-							
	-							
	-							
	-							
	(<u> </u>							
¹ Type: C=C	oncentration, D=De	pletion, RI	M=Reduc	ed Matrix, CS	=Covered or Co	oated Sand Gra	ains. ² Location	n: PL=Pore Lining, M=Matrix.
	Indicators: (Applic							Problematic Hydric Soils ³ :
Histosol			•		Bleyed Matrix (S	:4)		(A9) (LRR I , J)
					•) +)		
	pipedon (A2)				Redox (S5)			rie Redox (A16) (LRR F, G, H)
	istic (A3)				Matrix (S6)			ce (S7) (LRR G)
Hydroge	en Sulfide (A4)			Loamy N	Mucky Mineral (F1)	High Plains	Depressions (F16)
Stratified	d Layers (A5) (LRR	F)		Loamy 0	Gleyed Matrix (F	-2)	(LRR H	outside of MLRA 72 & 73)
1 cm Mu	uck (A9) (LRR F, G,	H)		Depleted	d Matrix (F3)		Reduced V	ertic (F18)
	d Below Dark Surfac	,		Redox D	Oark Surface (F	3)	Red Parent	Material (TF2)
	ark Surface (A12)	` '			d Dark Surface			ow Dark Surface (TF12)
	Mucky Mineral (S1)				Depressions (F8			lain in Remarks)
-	Mucky Peat or Peat	(S2) (I DE	C III		ins Depression			/drophytic vegetation and
						. ,		
5 cm ivit	ucky Peat or Peat (S	53) (LRR I	-)	(IVILI	RA 72 & 73 of I	LKK H)		drology must be present,
							unless disti	urbed or problematic.
Restrictive	Layer (if present):							
Type:								
Depth (in	ches):						Hydric Soil Pres	sent? Yes No ^x
Remarks:							,	
No redox fe	atures							
HYDROLO	GY							
Wetland Hy	drology Indicators							
_					,			
Primary India	cators (minimum of	one requir	ed; check	all that apply	/)		Secondary In	dicators (minimum of two required)
Surface	Water (A1)		_	_ Salt Crust	(B11)		Surface	Soil Cracks (B6)
High Wa	ater Table (A2)			Aquatic Inv	vertebrates (B13	3)	Sparsely	Vegetated Concave Surface (B8)
Saturati			_		Sulfide Odor (C			e Patterns (B10)
	` '		_		n Water Table (, ,
	larks (B1)		_	_ ′	,	,		Rhizospheres on Living Roots (C3)
· 	nt Deposits (B2)		_		hizospheres on	Living Roots (,	e tilled)
Drift De	posits (B3)			(where n	ot tilled)		Crayfish	Burrows (C8)
Algal Ma	at or Crust (B4)			_ Presence of	of Reduced Iron	(C4)	Saturation	on Visible on Aerial Imagery (C9)
Iron Der	oosits (B5)			Thin Muck	Surface (C7)		Geomor	ohic Position (D2)
	on Visible on Aerial	Imagan, (lain in Remarks	.1		utral Test (D5)
		iiiagery (DI) _	_ Other (Exp	nain in Nemarks	·)		
<u> </u>	tained Leaves (B9)						Frost-He	ave Hummocks (D7) (LRR F)
Field Obser	vations:							
Surface Wat	er Present?	Yes	No X	Depth (inc	ches):			
Water Table					ches):			
							and Headan Leave B	No. Voc.
Saturation P		Yes	_ No <u>^</u> _	Depth (inc	ches):	vvetia	ina Hyarology Pre	esent? Yes No ×
(includes cap	corded Data (strean	n dalide r	monitoring	well aerial r	photos provious	inenactions) i	f available:	
Describe IVE	corded Data (Stiedii	ıı yauye, I	HOHIOHIT	, weii, aeiidi þ	motos, previous	, mapeciiona), i	ı avallabic.	
Remarks:								
	av.							
Remarks: No hydrolog	ду.							
	ду.							

Project/Site: US 287 Lamar Bypass		City/Co	ounty:	Prowers C	County Sampling Date: 12/10/12	
Applicant/Owner: CDOT					State: CO Sampling Point: SP-10	
Investigator(s): T. Demasters,					nge: Section 20, Township 22 South, Range 46 West	
					convex, none): Flat Slope (%): 1	
Subregion (LRR): G- Western Great Plains						
Soil Map Unit Name: Rocky Ford Clay Loam, 0-1 % Slope					NWI classification: PEMC	
Are climatic / hydrologic conditions on the site typical for						
Are Vegetation, Soil, or Hydrology						
Are Vegetation, Soil, or Hydrology					eeded, explain any answers in Remarks.)	
SUMMARY OF FINDINGS – Attach site ma						tc.
Hydrophytic Vegetation Present? Yes X	No		lo the	Sampled	1 Avec	
Hydric Soil Present? Yes X	No			n a Wetlar		
Wetland Hydrology Present? Yes X	No		WILLIAM	ii a vvetiai	165	
*Extreme drought conditions (droughtmonitor.unl.e Sampling Point completed on a small shelf within VEGETATION – Use scientific names of pla	Markham Ar	royo d	on sou	uthwest ba	ank.	
	Absolute	Dom	inant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size: 30 Ft radius)	% Cover				Number of Dominant Species	
1					That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)
2						,
3					Total Number of Dominant Species Across All Strata: 2 (B))
	0			er	Percent of Dominant Species	
Sapling/Shrub Stratum (Plot size: 15 Ft radius)					That Are OBL, FACW, or FAC: 100 (A/	B)
1					Prevalence Index worksheet:	
2					Total % Cover of: Multiply by:	
3					OBL species <u>5</u> x 1 = <u>5</u>	
4. 5.					FACW species <u>35</u> x 2 = <u>70</u>	
<u> </u>	•	= Tota	al Cove	er	FAC species 40 x 3 = 120	
Herb Stratum (Plot size: 5 Ft radius					FACU species 15 x 4 = 60	
1. Chenopodium album	15	N		FACU	UPL species x 5 =	
2. Rumex crispus	40	Y		FAC	Column Totals: <u>95</u> (A) <u>255</u> (E	3)
3. Schoenoplectus pungens 4 Polypogon monspeliensis	<u>2</u> 35	N		OBL FACW	Prevalence Index = B/A = 2.68	
Folypogon monspellensis Juncus balticus	3	N		OBL	Hydrophytic Vegetation Indicators:	
					1 - Rapid Test for Hydrophytic Vegetation	
6					X 2 - Dominance Test is >50%	
8.					X 3 - Prevalence Index is ≤3.0 ¹	
9					 4 - Morphological Adaptations¹ (Provide supportidata in Remarks or on a separate sheet) 	ng
10.					Problematic Hydrophytic Vegetation (Explain)	
	95	= Tota	al Cove	er		
Woody Vine Stratum (Plot size:) 1					¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
2					Hydrophytic	
W Book Crowned in Unit Otto 5		= Tota	al Cove	er	Vegetation Present? Yes X No	
% Bare Ground in Herb Stratum 5 Remarks:	DE - EAC No	tral Toot fo	or hydrole -	IV Drop all EAC	, cross examine all other dominants. If > 50% remaining are FACW to OBL, then YES to	DE
	20 - I NO MEU	1 631 10	s. nyaroidg	₁₇ . <i>Diop</i> all 1 AO,	, a cook community and in out of communities in 2 do 70 remaining are 1 Advived Objet, then the 5 to	50.

Depth Matrix Redox Features (inches) Color (moist) % Type¹ Loc² Texture	ators.)
Linchael Color (moiet) % Color (moiet) % Lino Loc Loviuro	5 .
	Remarks
0-9 10YR 5/2 90 10YR 5/1 2 D M silty clay	
9-16 10YR 6/3 90 10YR 5/8 10 C M sand with sn	nall gravels
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: Pl	L=Pore Lining, M=Matrix.
	lematic Hydric Soils ³ :
Histosol (A1) Sandy Gleyed Matrix (S4) 1 cm Muck (A9)	•
	edox (A16) (LRR F, G, H)
Black Histic (A3) Stripped Matrix (S6) Dark Surface (S	37) (LRR G)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) High Plains Dep	
	side of MLRA 72 & 73)
1 cm Muck (A9) (LRR F, G, H)	` '
	ark Surface (TF12)
Sandy Mucky Mineral (S1) Redox Depressions (F8) Other (Explain in	
	phytic vegetation and
5 cm Mucky Peat or Peat (S3) (LRR F) (MLRA 72 & 73 of LRR H) wetland hydrolog unless disturbed	gy must be present,
Restrictive Layer (if present):	or problematic.
Type:	
Depth (inches): Hydric Soil Present?	? Yes ^x No
Remarks:	
Redox in sand layer at junction between two horizons mostly.	
HYDROLOGY	
Wetland Hydrology Indicators:	
	tors (minimum of two required)
Surface Water (A1) Salt Crust (B11) Surface Soil 0	_
	jetated Concave Surface (B8)
X Saturation (A3) Hydrogen Sulfide Odor (C1) Drainage Pati	
X Water Marks (B1) Dry-Season Water Table (C2) Oxidized Rhiz	zospheres on Living Roots (C3)
X Sediment Deposits (B2) X Oxidized Rhizospheres on Living Roots (C3) (where tilled	ed)
X Drift Deposits (B3) (where not tilled) Crayfish Burre	• •
	sible on Aerial Imagery (C9)
Iron Deposits (B5) Thin Muck Surface (C7) X_ Geomorphic I	
Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) FAC-Neutral	
Water 0(c) and 1 areas (P0)	Hummocks (D7) (LRR F)
<u> </u>	
Field Observations:	
Field Observations: Surface Water Present? Yes No _X Depth (inches):	
Field Observations: Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches):	t? Yas X Na
Field Observations: Surface Water Present? Yes No _X Depth (inches): Water Table Present? Yes _X No Depth (inches): _6" Saturation Present? Yes _X No Depth (inches): _0" Wetland Hydrology Present (includes capillary fringe)	t? Yes <u>×</u> No
Field Observations: Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Saturation Present? Yes No Depth (inches): Wetland Hydrology Present	t? Yes <u>×</u> No
Field Observations: Surface Water Present? Yes No _X Depth (inches): Water Table Present? Yes _X No Depth (inches): _6" Saturation Present? Yes _X No Depth (inches): _0" Wetland Hydrology Present (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	t? Yes <u>×</u> No
Field Observations: Surface Water Present? Yes No _X Depth (inches): Water Table Present? Yes _X No Depth (inches): _6" Saturation Present? Yes _X No Depth (inches): _0" Wetland Hydrology Present (includes capillary fringe)	t? Yes <u>×</u> No
Field Observations: Surface Water Present? Yes No _X Depth (inches): Water Table Present? Yes _X No Depth (inches): _6" Saturation Present? Yes _X No Depth (inches): _0" Wetland Hydrology Present (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	t? Yes <u>×</u> No

Project/Site: US 287 Lamar Bypass		City/County	Prowers 0	County	Sampling D	ate: 12/10/1	2	
				State: CO Sampling Point: SP-11				
Investigator(s): T. Demasters		Section, To	wnship, Ra	nge: Section 20, Towns	hip 22 South, R	Range 46 We	st	
				convex, none): Flat				
Subregion (LRR): G- Western Great Plains								
Soil Map Unit Name: Rocky Ford Clay Loam, 0-1 % Slopes				NWI classit				
Are climatic / hydrologic conditions on the site typical for this								
Are Vegetation, Soil, or Hydrologys						s ^X No	0	
Are Vegetation, Soil, or Hydrology r				eeded, explain any answ				
SUMMARY OF FINDINGS – Attach site map						,	s, etc.	
Hydrophytic Vegetation Present? Yes N	lo X							
Hydric Soil Present? Yes N			e Sampled in a Wetlar		No X			
Wetland Hydrology Present? Yes N Remarks:		With	iii a vvetiai	iu: Tes	NO			
*Extreme drought conditions (droughtmonitor.unl.ed		ave Helen	d nair nair	ot with SD 10				
Sampling Point completed on bank slope above Mai	rknam Arro	byo. Uplan	a pair poir	it with SP-10				
VEGETATION – Use scientific names of plan	ıts.							
	Absolute	Dominant	Indicator	Dominance Test wo	rksheet:			
Tree Stratum (Plot size: 30 Ft radius)		Species?	Status	Number of Dominant				
1				That Are OBL, FACW (excluding FAC-):	, or FAC 0		(A)	
2							(A)	
3				Total Number of Dom Species Across All St	2		(B)	
4		= Total Cov					(D)	
Sapling/Shrub Stratum (Plot size: 15 Ft radius)		- Total Cov	/ei	Percent of Dominant : That Are OBL, FACW	Species , or FAC: 0		(A/B)	
1						-		
2				Prevalence Index wo		المراط بالمثلاليا		
3				Total % Cover of: OBL species				
4				FACW species				
5				FAC species 7				
Herb Stratum (Plot size: 5 Ft radius	0	= Total Cov	/er	FACU species 55	x 4 =	220	_	
1. Pascopyrum smithii	40	Υ	FACU	UPL species 25	x 5 =		_	
2. Oenothera spp.	15	Υ	FACU	Column Totals: 87	(A)	366	_ (B)	
3. Kochia scoparia	15	Υ	UPL	Prevalence Inde	w = B/A = 4.5	2		
4. Helianthus pumilus	10	N	UPL	Hydrophytic Vegeta	·			
5. Asclepias speciosa	7	<u>N</u>	FAC	1 - Rapid Test for				
6				2 - Dominance Te		BL.		
7				3 - Prevalence In				
8				4 - Morphological	Adaptations ¹ ((Provide sup	porting	
9				data in Remar	ks or on a sepa	arate sheet)		
10		= Total Cov	/or	Problematic Hydr	ophytic Vegeta	ation' (Explai	in)	
Woody Vine Stratum (Plot size:) 1)				¹ Indicators of hydric s be present, unless dis			nust	
2.				Hydrophytic				
% Bare Ground in Herb Stratum 13		= Total Cov		Vegetation	′es N	lo <u>×</u>		
Remarks:	D5 - FAC Neu	tral Test for hydrolo	ogy. Drop all FAC,	cross examine all other dominants. If	> 50% remaining are F	ACW to OBL, then	YES to D5.	
13% bare, dirt banks								

SOIL

Sampling Point: SP-11

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

Depth	Matrix				K Feature:								
(inches)	Color (moist)	%	Cold	or (moist)	%	Type ¹	Loc ²	Texture	Remarks				
0-16	10YR 5/4	60						silty loam					
	10YR 4/3	40											
		_											
¹ Type: C=C	oncentration, D=De	epletion, RM	1=Reduc	ed Matrix, CS	=Covered	d or Coate	d Sand G	rains. ² Location	: PL=Pore Lining, M=Matrix				
	Indicators: (Appl								roblematic Hydric Soils ³ :				
Histosol	(A1)			Sandy G	aleyed Ma	trix (S4)		1 cm Muck ((A9) (LRR I, J)				
	oipedon (A2)				ledox (S5				e Redox (A16) (LRR F, G, H	1)			
	Black Histic (A3)				Matrix (S				e (S7) (LRR G)				
Hydrogen Sulfide (A4)						neral (F1)		-	Depressions (F16)				
	d Layers (A5) (LRF				Sleyed Ma			(LRR H o	outside of MLRA 72 & 73)				
	ick (A9) (LRR F, G d Below Dark Surfa			d Matrix (I)ark Surfa	,			Material (TF2)					
	ark Surface (A12)				rface (F7)			w Dark Surface (TF12)					
	lucky Mineral (S1)				epression				ain in Remarks)				
	Mucky Peat or Pea		G , H)			essions (F	16)		drophytic vegetation and				
5 cm Mu	icky Peat or Peat (S3) (LRR F)	(MLF	RA 72 & 7	73 of LRR	H)						
								unless distu	rbed or problematic.				
	Layer (if present):												
Type:													
Depth (in	ches):							Hydric Soil Pres	ent? Yes No <u>×</u>				
Remarks:	recent to a			N									
Mixed noriz	ons, difficult to d	etermine b	reaks.	Not nyaric.									
HYDROLO	GY												
Wetland Hy	drology Indicators	s:											
_	cators (minimum of		ed; check	all that apply	()			Secondary Inc	dicators (minimum of two rec	uired)			
Surface	Water (A1)			_ Salt Crust ((B11)			Surface S	Soil Cracks (B6)				
	ater Table (A2)			_ Aquatic Inv	. ,	s (B13)		Sparsely Vegetated Concave Surface (B8)					
Saturation				_ Hydrogen S				Drainage Patterns (B10)					
Water M	larks (B1)		_	_ Dry-Seaso				Oxidized Rhizospheres on Living Roots (C3)					
Sedimer	nt Deposits (B2)		_	Oxidized R	hizosphe	res on Livi	ing Roots	(C3) (where	tilled)				
Drift Dep	posits (B3)			(where n	ot tilled)			Crayfish E	Burrows (C8)				
Algal Ma	at or Crust (B4)			_ Presence c	of Reduce	d Iron (C4	1)	Saturation	n Visible on Aerial Imagery (C9)			
Iron Dep	oosits (B5)			_ Thin Muck	Surface (C7)		Geomorp	hic Position (D2)				
Inundati	on Visible on Aeria	ıl Imagery (E	37) _	_ Other (Exp	lain in Re	marks)		FAC-Neu	tral Test (D5)				
Water-S	tained Leaves (B9)						Frost-Hea	ave Hummocks (D7) (LRR F	=)			
Field Obser	vations:												
Surface Wat	er Present?			Depth (inc									
Water Table	Present?	Yes	No X	Depth (inc	hes):								
Saturation P		Yes	No X	Depth (inc	:hes):		_ Wetl	land Hydrology Pre	sent? Yes No _ ^x				
(includes cap Describe Re	corded Data (strea	m gauge, m	nonitoring	y well, aerial p	hotos, pr	evious ins	pections),	if available:					
	,				• •		. ,						
Remarks:													
No hydrolog	Jy.												

Project/Site: US 287 Lamar Bypass	(City/Cou	unty: Prowers	County	Sampling Date: 12/11/12
Applicant/Owner: CDOT					Sampling Point: SP-12
Investigator(s): T. Demasters,		Section	, Township, R	ange: Section 28, Townsh	nip 22 South, Range 46 West
Landform (hillslope, terrace, etc.): bank					
Subregion (LRR): G- Western Great Plains					
Soil Map Unit Name: Las clay loam, clay substratum					cation:
Are climatic / hydrologic conditions on the site typical for th					
Are Vegetation, Soil, or Hydrology					present? Yes X No
Are Vegetation, Soil, or Hydrology	naturally pro	blematio	c? (If n	eeded, explain any answ	ers in Remarks.)
SUMMARY OF FINDINGS – Attach site map	showing	samp	ling point	locations, transects	s, important features, etc.
Hydrophytic Vegetation Present? Yes X	No		a tha Campla	d Area	
Hydric Soil Present? Yes X			s the Sample		No
Wetland Hydrology Present? Yes X Remarks:	No		within a wette		
*Extreme drought conditions (droughtmonitor.unl.ed					
Hyde Canal, north of Arkansas River - eastern porti becoming too steep. Not continuous, mostly on no		v bank	along canal.	Water present in cana	al. Fringe about 2' before
VEGETATION – Use scientific names of plan	nts.			_	
Tree Stratum (Plot size: 30 Ft radius)	Absolute % Cover		nant Indicator es? Status	Dominance Test wor	
1				Number of Dominant S That Are OBL, FACW,	or FAC
2.				(excluding FAC-):	<u>1</u> (A)
3.				Total Number of Domi	nant
4				Species Across All Str	ata: 1 (B)
Sapling/Shrub Stratum (Plot size: 15 Ft radius)	0	= Total	Cover	Percent of Dominant S That Are OBL, FACW,	
1.	_				
2				Prevalence Index wo	
3					Multiply by:
4					x 1 = 10
5					x 2 =
5 Et radius	0	= Total	Cover		x 3 = 270
Herb Stratum (Plot size: 5 Ft radius 1 Sporobolus airoides	85	Υ	FAC	FACU species	_
2. Schoenoplectus pungens	10	<u>'</u> N	OBL	UPL species Column Totals: 100	x 5 = (A) 280 (B)
3. Chenopodium album	5	N	FAC	Column Totals: 100	(A) <u>280</u> (B)
4		-		Prevalence Inde	x = B/A = 2.80
5				Hydrophytic Vegetat	
6				1 - Rapid Test for	Hydrophytic Vegetation
7				X 2 - Dominance Te	
8				X 3 - Prevalence Inc	
9					Adaptations ¹ (Provide supporting so or on a separate sheet)
10					ophytic Vegetation ¹ (Explain)
	400	= Total		1.	
Woody Vine Stratum (Plot size:) 1				¹ Indicators of hydric so be present, unless dis	oil and wetland hydrology must turbed or problematic.
2				Hydrophytic	
				Vegetation	ν
% Bare Ground in Herb Stratum 0					es <u>X</u> No
Remarks:	D5 - FAC Neut	ral Test for h	nydrology. Drop all FA0	C, cross examine all other dominants. If >	50% remaining are FACW to OBL, then YES to D5.

Profile Desc	ription: (Describe	to the de	oth needed to docur	nent the	indicator	or confire	m the absence	of indicators.)			
Depth	Matrix				k Features			,			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks			
0-12	10YR 4/1	70	10YR 5/6	20	<u>C</u>	М	silty loam	staining			
			gley2 3/10BG	10	С	M		dark gley component			
	-					-					
							·				
						-	· ——				
		- '									
¹ Type: C=Co	oncentration. D=Dep	letion. RM	=Reduced Matrix, CS	S=Covere	d or Coate	ed Sand G	Frains. ² Lo	cation: PL=Pore Lining, M=Matrix.			
			LRRs, unless other					for Problematic Hydric Soils ³ :			
Histosol	(A1)		Sandy 0	Sleyed M	atrix (S4)		1 cm N	Muck (A9) (LRR I, J)			
Histic Ep	pipedon (A2)		Sandy F	Redox (S	5)		Coast	Prairie Redox (A16) (LRR F, G, H)			
Black His	` '			d Matrix (Surface (S7) (LRR G)			
	n Sulfide (A4)				ineral (F1)		_	Plains Depressions (F16)			
	Layers (A5) (LRR I			-	latrix (F2)		`	RR H outside of MLRA 72 & 73)			
	ck (A9) (LRR F, G,			d Matrix	. ,			ed Vertic (F18)			
	l Below Dark Surfac ark Surface (A12)	e (A11)		Dark Surf	ace (F6) urface (F7	١		arent Material (TF2) Shallow Dark Surface (TF12)			
	lucky Mineral (S1)			o Dark S Depressio		,		(Explain in Remarks)			
	lucky Peat or Peat (S2) (LRR			essions (F	16)	³ Indicators of hydrophytic vegetation and				
	cky Peat or Peat (S				73 of LRF		wetland hydrology must be present,				
							unless	disturbed or problematic.			
Restrictive L	ayer (if present):										
Type:			<u></u>								
Depth (inc	ches):						Hydric Soil	Present? Yes X No No			
Remarks:	f 11 11 40"				. "		6 11				
couldn't dig	further than 12", v	vater in p	it prevented getting	comple	ete soil sa	mple pro	file.				
HYDROLO	GY										
Wetland Hyd	drology Indicators:										
Primary Indic	ators (minimum of c	ne require	d; check all that appl	y)			Seconda	ary Indicators (minimum of two required)			
Surface	Water (A1)		Salt Crust	(B11)			Sur	face Soil Cracks (B6)			
High Wa	ter Table (A2)		Aquatic In	vertebrat	es (B13)		Spa	rsely Vegetated Concave Surface (B8)			
X Saturation	on (A3)		Hydrogen	Sulfide C	dor (C1)		Dra	inage Patterns (B10)			
Water M	arks (B1)		Dry-Seaso	n Water	Table (C2))	Oxi	dized Rhizospheres on Living Roots (C3)			
Sedimer	t Deposits (B2)		Oxidized F	Rhizosph	eres on Liv	ing Roots	(C3) (v	vhere tilled)			
Drift Dep	oosits (B3)		(where i	not tilled)		Cra	yfish Burrows (C8)			
Algal Ma	t or Crust (B4)		Presence	of Reduc	ed Iron (C	4)	Sati	uration Visible on Aerial Imagery (C9)			
Iron Dep	osits (B5)		Thin Muck	Surface	(C7)		X Geo	omorphic Position (D2)			
Inundation	on Visible on Aerial	lmagery (E	37) Other (Exp	olain in R	emarks)		<u>X</u> FAC	C-Neutral Test (D5)			
Water-S	tained Leaves (B9)						Fro	st-Heave Hummocks (D7) (LRR F)			
Field Observ											
Surface Water			No X Depth (in			_					
Water Table			No Depth (in			_					
Saturation Pr		es X	No Depth (in	ches): <u>0</u> '		Wet	land Hydrolog	y Present? Yes × No No			
(includes cap Describe Red		gauge, m	onitoring well, aerial ¡	ohotos, p	revious ins	spections)	, if available:				
	•	-	-	•		,					
Remarks:											

Project/Site: US 287 Lamar Bypass		City/Co	ounty: Prowers	County	Sampling Date: 12/11/12		
Applicant/Owner: CDOT	_				Sampling Point: SP-13	Sampling Point: SP-13	
Investigator(s): T. Demasters,					ship 22 South, Range 46 We		
					Slope (%)		
Subregion (LRR): G- Western Great Plains							
					ification:		
Are climatic / hydrologic conditions on the site typical for							
Are Vegetation, Soil, or Hydrology	•				s" present? Yes X N	No	
Are Vegetation, Soil, or Hydrology				needed, explain any ansv			
SUMMARY OF FINDINGS – Attach site ma						es, etc.	
Hydrophytic Vegetation Present? Yes	No X		Is the Sample	ed Area			
Hydric Soil Present? Yes			within a Wetla		No X		
Wetland Hydrology Present? Yes	No <u>x</u>						
*Extreme drought conditions (droughtmonitor.unl.e Hyde Canal, north of Arkansas River. On top of b VEGETATION – Use scientific names of pla	ank, upland	sampl	ling point for S	SP-12.			
Tree Stratum (Plot size: 30 Ft radius			inant Indicator				
			cies? Status	 Number of Dominant That Are OBL, FACV 			
1 2				(excluding FAC-):	0	(A)	
3				Total Number of Don	ninant		
4.				Species Across All S	^	_ (B)	
Sapling/Shrub Stratum (Plot size: 15 Ft radius) 1)	0			Percent of Dominant That Are OBL, FACV		(A/B)	
2				Prevalence Index w			
3.				Total % Cover o			
4					x 1 =		
5					x 2 = <u>30</u>		
Herb Stratum (Plot size: 5 Ft radius)	0	= Tota	al Cover	FACU species 25	x 3 =	_	
Grindelia acutifolia	25	Υ	UPL	UPL species 60		_	
2. Distichlis spicata	15	N	FACW	Column Totals: 100		(B)	
3. Pascopyrum smithii	30	Υ	UPL	-	. ,	_ ()	
4. Kochia scoparia	20	Υ	FACU		ex = B/A = 4.30		
5. Helianthus annuus	5	N	FACU	Hydrophytic Vegeta			
6. Descurainia pinnata	5	N	UPL	2 - Dominance T	or Hydrophytic Vegetation John Strain Strai		
7				3 - Prevalence Ir			
8					al Adaptations ¹ (Provide su	pporting	
9					arks or on a separate sheet		
10	400	T.1.		- Problematic Hyd	Irophytic Vegetation ¹ (Expla	ain)	
Woody Vine Stratum (Plot size:) 1			al Cover		soil and wetland hydrology isturbed or problematic.	must	
2.			al Cover	_ Hydrophytic Vegetation			
% Bare Ground in Herb Stratum 0		· Ola	50 001	Present? Yes No _X			
Remarks:	D5 - FAC Neut	tral Test for	r hydrology. Drop all FA	C, cross examine all other dominants. I	If > 50% remaining are FACW to OBL, then	YES to D5.	

SOIL

Sampling Point: SP-13

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

Depth	Matrix			Redox Features			
(inches)	Color (moist)	%	Cold	or (moist) % Type ¹	Loc ²	<u>Texture</u>	Remarks
0-16	10YR 6/4	70				silty loam	mixed horizons
	10YR 4/2	30		·			
·		-			· 		
			-				
			-				
¹Type: C=C	oncentration D=De	nletion RN	/=Reduc	ed Matrix, CS=Covered or Coate	ad Sand Gr	ains ² l o	cation: PL=Pore Lining, M=Matrix.
				unless otherwise noted.)	od Sand On		for Problematic Hydric Soils ³ :
_		ioabic to a	ii Litito,				•
Histosol				Sandy Gleyed Matrix (S4)Sandy Redox (S5)			Muck (A9) (LRR I, J) Prairie Redox (A16) (LRR F, G, H)
Black Hi	oipedon (A2)			Stripped Matrix (S6)			Surface (S7) (LRR G)
	en Sulfide (A4)			Loamy Mucky Mineral (F1)			Plains Depressions (F16)
	d Layers (A5) (LRR) E \		Loamy Gleyed Matrix (F2)		_	RR H outside of MLRA 72 & 73)
	ick (A9) (LRR F, G			Depleted Matrix (F3)		`	red Vertic (F18)
	d Below Dark Surfa			Redox Dark Surface (F6)			arent Material (TF2)
-	ark Surface (A12)	(00 (/ (1 1 /		Depleted Dark Surface (F7)		Shallow Dark Surface (TF12)
	fucky Mineral (S1)			Redox Depressions (F8)	,		(Explain in Remarks)
-	Mucky Peat or Peat	(S2) (LRR	G. H)	High Plains Depressions (F	16)		of hydrophytic vegetation and
	icky Peat or Peat ((MLRA 72 & 73 of LRF			d hydrology must be present,
_	,	, ,	,	,	,		disturbed or problematic.
Restrictive I	Layer (if present):						·
Type:							
Depth (inc	ches).					Hydric Soil	Present? Yes No X
	onco)					Tiyano oon	1103CHC 103 NO
Remarks:		ام مینامد الم	مدر ماداداد	sintananaa wali maat likali.			
Some layen	ing, but mostly w	eli mixea,	alten m	aintenance work most likely.			
HYDROLO	CV						
Wetland Hye	drology Indicators	s:					
Primary Indic	cators (minimum of	one require	ed; check	(all that apply)		Seconda	ary Indicators (minimum of two required)
Surface	Water (A1)			_ Salt Crust (B11)		Sur	face Soil Cracks (B6)
High Wa	ater Table (A2)		_	_ Aquatic Invertebrates (B13)		Spa	rsely Vegetated Concave Surface (B8)
Saturation				_ Hydrogen Sulfide Odor (C1)			inage Patterns (B10)
	larks (B1)		_	Dry-Season Water Table (C2))	·	dized Rhizospheres on Living Roots (C3)
	nt Deposits (B2)			_ Oxidized Rhizospheres on Liv			where tilled)
, <u> </u>	posits (B3)			(where not tilled)			yfish Burrows (C8)
	at or Crust (B4)			_ Presence of Reduced Iron (C-	4)		uration Visible on Aerial Imagery (C9)
_	oosits (B5)		_	Thin Muck Surface (C7)	T)		emorphic Position (D2)
	on Visible on Aeria	l Imaganı (l	— D7\	Other (Explain in Remarks)			
		0 , (D/) _	_ Other (Explain in Remarks)			C-Neutral Test (D5)
		١					st-Heave Hummocks (D7) (LRR F)
_	tained Leaves (B9))				1100	
Field Obser	tained Leaves (B9) vations:	<u> </u>					
Field Observ	tained Leaves (B9) vations: er Present?	Yes		Depth (inches):			
Field Obser	tained Leaves (B9) vations: er Present?	Yes		Depth (inches): Depth (inches):			
Field Obsert Surface Water Water Table Saturation Pro	tained Leaves (B9) vations: er Present? Present? resent?	Yes	No X				y Present? Yes No [×]
Field Obsers Surface Water Water Table Saturation Pro (includes cap	tained Leaves (B9) vations: er Present? Present? resent? pillary fringe)	Yes Yes Yes	No X	Depth (inches): Depth (inches):	Wetla	and Hydrolog	y Present? Yes No ^x
Field Obsers Surface Water Water Table Saturation Pro (includes cap	tained Leaves (B9) vations: er Present? Present? resent? pillary fringe)	Yes Yes Yes	No X	Depth (inches):	Wetla	and Hydrolog	y Present? Yes No ×
Field Obsers Surface Water Water Table Saturation Pro (includes cap	tained Leaves (B9) vations: er Present? Present? resent? pillary fringe)	Yes Yes Yes	No X	Depth (inches): Depth (inches):	Wetla	and Hydrolog	y Present? Yes No ^x
Field Obsers Surface Water Water Table Saturation Pro (includes cap	tained Leaves (B9) vations: er Present? Present? resent? pillary fringe)	Yes Yes Yes	No X	Depth (inches): Depth (inches):	Wetla	and Hydrolog	y Present? Yes No [×]
Field Obsert Surface Water Water Table Saturation Pro (includes cap Describe Rec	tained Leaves (B9) vations: er Present? Present? resent? pillary fringe)	Yes Yes Yes	No X	Depth (inches): Depth (inches):	Wetla	and Hydrolog	y Present? Yes No [×]
Field Obsert Surface Water Water Table Saturation Pr (includes cap Describe Rec	tained Leaves (B9) vations: er Present? Present? resent? pillary fringe)	Yes Yes Yes	No X	Depth (inches): Depth (inches):	Wetla	and Hydrolog	y Present? Yes No <u>×</u>
Field Obsert Surface Water Water Table Saturation Pro (includes cap Describe Rec	tained Leaves (B9) vations: er Present? Present? resent? pillary fringe)	Yes Yes Yes	No X	Depth (inches): Depth (inches):	Wetla	and Hydrolog	y Present? Yes No [×]

Project/Site: US 287 Lamar Bypass	C	ity/County:	Prowers C	County	Sampling [Date: 12/11/12	<u>?</u>
Applicant/Owner: CDOT				State: CO	Sampling F	oint: SP-14	
Investigator(s): T. Demasters,	S						st .
				convex, none): concav			
Subregion (LRR): G- Western Great Plains	Lat: 38.11	10785		Long: -102.596772		Datum: NAD	83
Soil Map Unit Name: Las clay loam, clay substratum				NWI class			
Are climatic / hydrologic conditions on the site typical for							
Are Vegetation, Soil, or Hydrology	significantly di	isturbed?	Are "	Normal Circumstances	s" present? Ye	es X No)
Are Vegetation, Soil, or Hydrology	naturally prob	lematic?	(If ne	eded, explain any ans	wers in Remar	ks.)	
SUMMARY OF FINDINGS – Attach site ma	ap showing s	sampling	point le	ocations, transec	ts, importa	nt features	s, etc.
Hydrophytic Vegetation Present? Yes X	No	lo the	Sampled	Araa			
Hydric Soil Present? Yes x	No		n a Wetlar		No		
Wetland Hydrology Present? Yes X	No	Within	i a vvetiai	iu: Tes <u></u>	NO		
Remarks: *Extreme drought conditions (droughtmonitor.unl Hyde Canal, north of Arkansas River - western p	ortion.						
VEGETATION – Use scientific names of p							
Tree Stratum (Plot size: 30 Ft radius	Absolute % Cover			Dominance Test we			
1			_	Number of Dominan That Are OBL, FAC			
2				(excluding FAC-):	2		(A)
3				Total Number of Dor			
4				Species Across All S	Strata: 2	<u> </u>	(B)
Sapling/Shrub Stratum (Plot size: 15 Ft radius)	0 =		er	Percent of Dominant That Are OBL, FAC		00	(A/B)
1 2				Prevalence Index w	orksheet:		
3				Total % Cover o		Multiply by:	_
4.					x 1 =		_
5				FACW species			
E Et an dive	0 =	Total Cove	er		x 3 =		-
Herb Stratum (Plot size: 5 Ft radius 1. Sporobolus airoides	40	V	FAC	FACU species			-
Sporobolus airoides Polypogon monspeliensis		<u>Y</u>	OBL	UPL species Column Totals: 85			– (B)
	 -	 -	OBL	Column Totals: 00	(A)	100	_ (D)
3				Prevalence Inc	lex = B/A = 1	.9	_
5				Hydrophytic Vegeta	ation Indicator	rs:	
6				1 - Rapid Test fo	or Hydrophytic	Vegetation	
7.				X 2 - Dominance			
8.				X 3 - Prevalence I			
9				4 - Morphologica	al Adaptations' arks or on a se _l	(Provide supposarate sheet)	orting
10				Problematic Hyd		•	n)
Woody Vine Stratum (Plot size:)		Total Cove		¹ Indicators of hydric be present, unless d	soil and wetlan	d hydrology m	
1 2				Hydrophytic Vegetation			
% Bare Ground in Herb Stratum 15				Present?	Yes <u>X</u>	No	
Remarks:	D5 - FAC Neutra	I Test for hydrolog	y. Drop all FAC,	cross examine all other dominants.	If > 50% remaining are	FACW to OBL, then YI	ES to D5.

Depth	Matrix			ox Featur		. ?					
(inches)	Color (moist)		Color (moist)	<u> %</u>	Type ¹	Loc ²		Remarks			
0-12	10YR 4/1	75	10YR 5/6	15	_ <u>C</u>	M	silty loam	staining			
			gley2 3/10BG	10	<u>C</u>	M		dark gley component			
			-								
-						-	-				
	· -			_		-					
	- <u> </u>		-								
					_						
¹Type: C=C	Concentration D=D	epletion RM	=Reduced Matrix, C	S=Covere	ed or Coate	ed Sand	Grains. ² l oc	cation: PL=Pore Lining, M=Matrix.			
			LRRs, unless other			o Caria		for Problematic Hydric Soils ³ :			
Histoso					latrix (S4)			Muck (A9) (LRR I, J)			
	pipedon (A2)			Redox (S				Prairie Redox (A16) (LRR F, G, H)			
	listic (A3)			ed Matrix (Surface (S7) (LRR G)			
Hydrog	en Sulfide (A4)		Loamy	Mucky M	ineral (F1)		High P	Plains Depressions (F16)			
	ed Layers (A5) (LRF				/latrix (F2)		,	RR H outside of MLRA 72 & 73)			
	uck (A9) (LRR F, G			ed Matrix				ed Vertic (F18)			
	ed Below Dark Surfa	ace (A11)		Dark Sur				arent Material (TF2)			
	Park Surface (A12)				Surface (F7)		hallow Dark Surface (TF12) (Explain in Remarks)			
	Mucky Mineral (S1) Mucky Peat or Pea			Depression	ons (Fo) ressions (F	16)		of hydrophytic vegetation and			
	ucky Peat or Peat (. , .			73 of LRF			wetland hydrology must be present,			
	acity i car or i car ((55) (=1111)	\			,		disturbed or problematic.			
Restrictive	Layer (if present)	•						·			
Type:											
Depth (ir	nches):						Hydric Soil	Present? Yes X No			
Remarks:											
Very simila	r to SP12										
•											
HYDROLC											
Wetland Hy	drology Indicator	s:									
Primary Indi	icators (minimum o	f one require	d; check all that app	oly)			Seconda	ary Indicators (minimum of two required)			
Surface	e Water (A1)		Salt Crus	t (B11)			Surf	face Soil Cracks (B6)			
High W	ater Table (A2)		Aquatic Ir	nvertebrat	es (B13)		Spa	rsely Vegetated Concave Surface (B8)			
X Saturat	ion (A3)		Hydroger	Sulfide C	Odor (C1)		X Drai	inage Patterns (B10)			
Water N	Marks (B1)		Dry-Seas	on Water	Table (C2)		Oxid	dized Rhizospheres on Living Roots (C3			
Sedime	ent Deposits (B2)		Oxidized	Rhizosph	eres on Liv	ing Roo	ts (C3) (w	here tilled)			
Drift De	eposits (B3)		(where	not tilled	I)		Cra	yfish Burrows (C8)			
Algal M	lat or Crust (B4)		Presence	of Reduc	ced Iron (C	4)	Sati	uration Visible on Aerial Imagery (C9)			
Iron De	posits (B5)		Thin Muc	k Surface	(C7)		X Geo	emorphic Position (D2)			
Inundat	tion Visible on Aeria	al Imagery (B	7) Other (Ex	cplain in R	Remarks)			C-Neutral Test (D5)			
Water-S	Stained Leaves (B9)					Fros	st-Heave Hummocks (D7) (LRR F)			
Field Obse	rvations:										
Surface Wa	ter Present?		No X Depth (in			_					
Water Table	e Present?	Yes X	No Depth (ir	nches): <u>7</u>	"						
Saturation F (includes ca	Present? pillary fringe)	Yes X	No Depth (in	nches): <u>0</u>	"	_ We	etland Hydrolog	y Present? Yes <u>×</u> No			
		ım gauge, m	onitoring well, aerial	photos, p	revious ins	pections	s), if available:				
Remarks:											

Project/Site: US 287 Lamar Bypass		City/Co	ounty:	Prowers C	County	Samp	oling Date: 12	/11/12
Applicant/Owner: CDOT					State: CO	Samp	oling Point: SF	P-15
Investigator(s): T. Demasters,							-	
					convex, none): Flat			
Subregion (LRR): G- Western Great Plains								
Soil Map Unit Name: Las clay loam, clay substratum					NWI cla			
Are climatic / hydrologic conditions on the site typical for								
Are Vegetation, Soil, or Hydrology					Normal Circumstan			No
Are Vegetation, Soil, or Hydrology					eded, explain any a			
SUMMARY OF FINDINGS – Attach site ma								ures, etc.
Hydrophytic Vegetation Present? Yes	No <u>x</u>		Is the	e Sampled	Area			
Hydric Soil Present? Yes				n a Wetlar			No X	
Wetland Hydrology Present? Yes	No <u>x</u>							
*Extreme drought conditions (droughtmonitor.unl. Hyde Canal, north of Arkansas River. On top of b VEGETATION – Use scientific names of pla	ank, upland	sampl	ling p	oint for SI	P-14.			
Tree Stratum (Plot size: 30 Ft radius)	Absolute % Cover				Dominance Test			
1					Number of Domin			
2					(excluding FAC-)		1	(A)
3.					Total Number of [Dominant		
4					Species Across A	ll Strata:	2	(B)
Sapling/Shrub Stratum (Plot size: 15 Ft radius) 1	0				Percent of Domin That Are OBL, FA		50	(A/B)
2					Prevalence Inde	x worksheet	t:	
3.					Total % Cove			
4					OBL species _			
5					FACW species 3			
Herb Stratum (Plot size: 5 Ft radius)	0	= Tota	al Cov	er	FAC species FACU species			
Bromis inermis	40	Υ		FACU			x 5 =	
2. Distichlis spicata	35	Υ		FACW	Column Totals:			(B)
3. Xanthium spinosum	5	N		FACU			2 125	
4					Prevalence			
5					Hydrophytic Veg 1 - Rapid Tes			on
6					2 - Dominand	All dominants are FAC Ce Test is >50	W and/or OBL.	OH
7					3 - Prevalence			
8					4 - Morpholog	gical Adaptat	tions ¹ (Provide	
9							a separate sh	•
10	00	= Tota	al Cov	er	Problematic I	Hydrophytic \	Vegetation' (E	Explain)
Woody Vine Stratum (Plot size:) 1)	<u> </u>				¹ Indicators of hyd be present, unles			
2				 er	Hydrophytic Vegetation			
% Bare Ground in Herb Stratum 20					Present?		No <u>X</u>	_
Remarks:	D5 - FAC Neut	tral Test fo	r hydrolo	gy. Drop all FAC,	cross examine all other domina	ants. If > 50% remain	ning are FACW to OB	., then YES to D5.

SOIL

Sampling Point: SP-15

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

Depth	Matrix				K Feature:					
(inches)	Color (moist)	%	Col	or (moist)	%	Type ¹	Loc ²	Texture	Remarks	
0-14	10YR 6/4	60						silty loam		
	10YR 6/3	40								
¹ Type: C=Ce	oncentration, D=D	epletion, RM	l=Reduc	ed Matrix, CS	=Covered	d or Coate	d Sand Gi	rains. ² Location	n: PL=Pore Lining, M=Matrix	
Hydric Soil	Indicators: (App	licable to al	I LRRs,	unless other	wise note	ed.)		Indicators for I	Problematic Hydric Soils ³ :	
Histosol	(A1)			Sandy G	Sleyed Ma	ıtrix (S4)		1 cm Muck	(A9) (LRR I, J)	
	oipedon (A2)				ledox (S5				rie Redox (A16) (LRR F, G, H)
	stic (A3)				Matrix (S				ce (S7) (LRR G)	
	en Sulfide (A4) d Layers (A5) (LR I	D E/			Mucky Mir Bleyed Ma			-	Depressions (F16) outside of MLRA 72 & 73)	
	ick (A9) (LRR F, C				d Matrix (I			Reduced V	,	
	d Below Dark Surf				ark Surfa	,			t Material (TF2)	
	ark Surface (A12)	, ,		· 		rface (F7)			ow Dark Surface (TF12)	
Sandy M	Mucky Mineral (S1))			epression				lain in Remarks)	
	Mucky Peat or Pea	. ,	_		essions (F			drophytic vegetation and		
5 cm Mu	icky Peat or Peat	(S3) (LRR F)	(MLF	RA 72 & 7	73 of LRR	H)		drology must be present,	
Postrictivo I	Layer (if present)							uniess disti	urbed or problematic.	
Type:										
Depth (in								Hydric Soil Pres	sent? Yes No ^x	
Remarks:								Tryunc con i res	Jent: 163 140_	
	oil indicators									
110 Hydrio o	on maioatoro									
HYDROLO	GY									
Wetland Hy	drology Indicator	s:								
Primary India	cators (minimum o	f one require	d; chec	k all that apply	/)			Secondary In	ndicators (minimum of two req	uired)
Surface	Water (A1)		_	Salt Crust ((B11)			Surface	Soil Cracks (B6)	
High Wa	ater Table (A2)		_	Aquatic Inv	ertebrate	s (B13)		Sparsely	Vegetated Concave Surface	(B8)
Saturation	on (A3)		_	_ Hydrogen S	Sulfide O	dor (C1)		Drainage	e Patterns (B10)	
Water M	larks (B1)		_	Dry-Seaso	n Water T	able (C2)		Oxidized	Rhizospheres on Living Roo	ts (C3)
Sedimer	nt Deposits (B2)		_	_ Oxidized R	hizosphe	res on Livi	ing Roots	(C3) (where	e tilled)	
	posits (B3)			(where n	ot tilled)			Crayfish	Burrows (C8)	
	at or Crust (B4)		_	_ Presence of			·)		on Visible on Aerial Imagery (C9)
	posits (B5)			Thin Muck					phic Position (D2)	
_	on Visible on Aeria	0 , (37) _	_ Other (Exp	lain in Re	marks)			utral Test (D5)	
	tained Leaves (B9	9)						Frost-He	eave Hummocks (D7) (LRR F	•)
Field Obser		.,	. Y	5 " "						
Surface Wat				Depth (inc						
Water Table				Depth (inc						
Saturation P		Yes	No <u>^</u>	Depth (inc	:hes):		_ Weti	and Hydrology Pre	esent? Yes No <u>×</u>	
	corded Data (strea	am gauge, m	onitorin	g well, aerial p	hotos, pr	evious ins	pections),	if available:		
Remarks:										
No hydrolog	gic indicators									

Project/Site: US 287 Lamar Bypass	(City/C	ounty:	Prowers C	County	Sampling I	Date: 12/11/1	12
Applicant/Owner: CDOT		,	-		State: CO			
• •		Sectio			nge: Section 20, Townshi			
Landform (hillslope, terrace, etc.): Shelf								
Subregion (LRR): G- Western Great Plains					Long: -102.596179			
Soil Map Unit Name: Las loam					NWI classific			
Are climatic / hydrologic conditions on the site typical for th								
Are Vegetation, Soil, or Hydrology							oo X N	lo.
								.0
Are Vegetation, Soil, or Hydrology SUMMARY OF FINDINGS - Attach site map					eeded, explain any answe			es, etc.
Hydrophytic Vegetation Present? Yes X N	No.							
Hydric Soil Present? Yes X Yes	No			e Sampled		Na		
Wetland Hydrology Present? Yes X	No		withi	n a wetiar	nd? Yes X	No		
Remarks:								
*Extreme drought conditions (droughtmonitor.unl.ec Vista Del Rio Ditch - relic ditch. Quite wide = 18'. S		re no	w. Di	ry year, w	ould be easier to find h	ıydrology i	n normal ye	ar.
VEGETATION – Use scientific names of plan					1 -			
Tree Stratum (Plot size: 30 Ft radius)	Absolute % Cover				Dominance Test work			
1					Number of Dominant S That Are OBL, FACW,	or FAC		
2.					(excluding FAC-):	3	,	(A)
3					Total Number of Domin	ant		
4					Species Across All Stra	ıta: <u>3</u>	3	(B)
Sapling/Shrub Stratum (Plot size: 15 Ft radius)	0	= Tota	al Cov	er	Percent of Dominant Sport That Are OBL, FACW,		100	(A/B)
1					Prevalence Index wor	kshoot:		
2					Total % Cover of:		Multiply by:	
3						x1:		_
4		-			FACW species 20			_
5	0		al Cov		FAC species 20	x 3 =	= 60	
Herb Stratum (Plot size: 5 Ft radius		- 101	ai Cov	eı	FACU species	x 4 :	=	
1. Schoenoplectus pungens	40	Υ		OBL	UPL species	x 5 =	=	_
2. Distichlis spicata	20	Υ		FACW	Column Totals: 80	(A)	140	(B)
3. Sporobolus airoides		Υ		FAC	Prevalence Index	= B/A = 1	.75	
4					Hydrophytic Vegetation			
5					1 - Rapid Test for I	Hvdrophytic	Vegetation	
6					X 2 - Dominance Tes	ants are FACW and/or st is >50%	OBL.	
7					X 3 - Prevalence Inde	ex is ≤3.0 ¹		
8 9					4 - Morphological A	Adaptations ¹	(Provide sup	porting
10.					data in Remark		. ,	
	00	= Tota	al Cov	er			, ,	,
Woody Vine Stratum (Plot size: 40) 1					¹ Indicators of hydric soil be present, unless disti			must
2.					Hydrophytic			
			al Cov	er	Vegetation Present? Ye	s ^X	No	
% Bare Ground in Herb Stratum 20	DE =1			. D	1		· <u> </u>	VEO: 5-
Remarks: Bare ground due to ponding and cow prints.	D5 - FAC Neut	ral Test fo	or hydrolo	gy. Drop all FAC,	cross examine all other dominants. If > 9	טע% remaining are	FACW to OBL, then	YES to D5.
Date ground due to ponding and dow prints.								

(inches) 0-7	0 1 (1 1)			ox Feature		. 2		
U- <i>1</i>	Color (moist) 10YR 4/1	<u>%</u> 90	Color (moist)	%	Type ¹	Loc² M/PL	Texture	Remarks
	- ·		7.5YR 4/6	10	<u>C</u>		clay	
7-16	10YR 4/1	30	7.5YR 4/6	70	<u>C</u>	M	clay	staining, very prevalent
			л=Reduced Matrix, С			ed Sand G		cation: PL=Pore Lining, M=Matrix.
-		cable to a	II LRRs, unless othe					for Problematic Hydric Soils ³ :
Black I Hydrog Stratific 1 cm N Deplet Thick I Sandy 2.5 cm	ol (A1) Epipedon (A2) Histic (A3) gen Sulfide (A4) ed Layers (A5) (LRR Muck (A9) (LRR F, G, ed Below Dark Surfa Dark Surface (A12) Mucky Mineral (S1) Mucky Peat or Peat Mucky Peat or Peat	H) ce (A11) (S2) (LRR	Sandy Strippe Loamy Loamy X Deplete Redox Deplete Redox _ Redox _ Redox _ High Pl	Gleyed Med Matrix Dark Surfed Dark S Depression	5) S6) neral (F1) latrix (F2) (F3) ace (F6) urface (F7	16)	Coast Dark S High P (LR Reduc Red Pc Very S Other	Muck (A9) (LRR I, J) Prairie Redox (A16) (LRR F, G, H) Surface (S7) (LRR G) Plains Depressions (F16) PR H outside of MLRA 72 & 73) Bed Vertic (F18) Barent Material (TF2) Challow Dark Surface (TF12) CExplain in Remarks) Of hydrophytic vegetation and Chydrology must be present,
	·	, ,	,			,		disturbed or problematic.
Depth (i Remarks:	nches):						Hydric Soil	Present? Yes X No No
YDROL	OGY							
	OGY ydrology Indicators	·:						
Wetland H	ydrology Indicators		ed; check all that app <u>x</u> Salt Crust				Surf	ary Indicators (minimum of two required face Soil Cracks (B6)
Wetland H Primary Inc Surface High W Satura	ydrology Indicators dicators (minimum of			(B11) vertebrate Sulfide C	dor (C1)		Surf Spa Drai	
Wetland H Primary Inc Surface High W Satura Water Sedime	ydrology Indicators dicators (minimum of e Water (A1) Vater Table (A2) tion (A3)		 X Salt Crust Aquatic In Hydrogen Dry-Seaso X Oxidized I 	(B11) evertebrate Sulfide Con Water	odor (C1) Table (C2) eres on Liv		Surf Spa Drai Oxio (C3) (w Cray	race Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) dized Rhizospheres on Living Roots (Carhere tilled) rfish Burrows (C8)
Wetland H Primary Inc Surface High W Satura Water Sedime Drift De Algal M Iron De	ydrology Indicators dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2)	one requir	x Salt Crust Aquatic In Hydrogen Dry-Sease X Oxidized I (where Presence Thin Muck	e (B11) evertebrate Sulfide Con Water Rhizosphe not tilled of Reduce	odor (C1) Table (C2) eres on Liv) ed Iron (C4) (C7)	ing Roots	Surf Spa Drai Oxic (C3) (w Cray X Satu X Geo X FAC	race Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) dized Rhizospheres on Living Roots (C3 rhere tilled)
Wetland H Primary Inc Surface High W Satura Water Sedime Drift De Algal N Iron De Inunda	ydrology Indicators dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) ation Visible on Aerial estained Leaves (B9)	one requir	x Salt Crust Aquatic In Hydrogen Dry-Sease X Oxidized I (where Presence Thin Muck	e (B11) evertebrate Sulfide Con Water Rhizosphe not tilled of Reduce	odor (C1) Table (C2) eres on Liv) ed Iron (C4) (C7)	ing Roots	Surf Spa Drai Oxic (C3) (w Cray X Satu X Geo X FAC	race Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) dized Rhizospheres on Living Roots (C3 rhere tilled) rfish Burrows (C8) uration Visible on Aerial Imagery (C9) rmorphic Position (D2) C-Neutral Test (D5)
Wetland H Primary Inc Surface High W Satura Water Sedime Drift De Algal M Iron De Inunda Water- Field Obse	ydrology Indicators dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) ation Visible on Aerial Stained Leaves (B9) ervations: ater Present?	Imagery (Yes	X Salt Crust	is (B11) avertebrate Sulfide Con Water Rhizospho not tilled of Reduce Surface plain in R	odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7) emarks)	ing Roots 4)	Surf Spa Drai Oxio (C3) (w Cray X Satu X Geo Fros	race Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) dized Rhizospheres on Living Roots (C3 rhere tilled) rfish Burrows (C8) uration Visible on Aerial Imagery (C9) rmorphic Position (D2) C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)
Wetland H Primary Inc Surface High W Satura Water Sedime Drift De Algal M Iron De Inunda Water- Field Obse Surface Wa Water Tabl Saturation (includes ca	ydrology Indicators dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) ation Visible on Aerial Stained Leaves (B9) ervations: ater Present? e Present? present?	Imagery (Yes Yes Yes	X Salt Crust	ix (B11) avertebrate Sulfide Con Water Rhizosphe not tilled of Reduce Surface plain in R aches): aches): aches): aches):	odor (C1) Table (C2) eres on Liv) ed Iron (C4) (C7) emarks)	ing Roots 4) Wet	Surf X Spa Drai Oxio (C3) (w Cray X Satu X Geo Fros	race Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) dized Rhizospheres on Living Roots (C3 rhere tilled) rfish Burrows (C8) uration Visible on Aerial Imagery (C9) rmorphic Position (D2) C-Neutral Test (D5)
Wetland H Primary Inc Surface High W Satura Water Sedime Drift De Algal N Iron De Inunda Water- Field Obse Surface Wa Water Tabl Saturation Cincludes ca	ydrology Indicators dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) ation Visible on Aerial Stained Leaves (B9) ervations: ater Present? e Present? present?	Imagery (Yes Yes Yes	X Salt Crust	ix (B11) avertebrate Sulfide Con Water Rhizosphe not tilled of Reduce Surface plain in R aches): aches): aches): aches):	odor (C1) Table (C2) eres on Liv) ed Iron (C4) (C7) emarks)	ing Roots 4) Wet	Surf X Spa Drai Oxio (C3) (w Cray X Satu X Geo Fros	race Soil Cracks (B6) rsely Vegetated Concave Surface (B8) nage Patterns (B10) dized Rhizospheres on Living Roots (Circle tilled) refish Burrows (C8) uration Visible on Aerial Imagery (C9) remorphic Position (D2) C-Neutral Test (D5) st-Heave Hummocks (D7) (LRR F)

Project/Site: US 287 Lamar Bypass	(City/C	ounty:	Prowers C	County Sampling Date: 12/11/12
Applicant/Owner: CDOT					State: CO Sampling Point: SP-17
Investigator(s): T. Demasters,					nge: Section 20, Township 22 South, Range 46 West
					convex, none): none Slope (%): 2
Subregion (LRR): G- Western Great Plains					
Soil Map Unit Name: Las loam					NWI classification:
Are climatic / hydrologic conditions on the site typical for					
Are Vegetation, Soil, or Hydrology					"Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology					eeded, explain any answers in Remarks.)
					ocations, transects, important features, etc
Hydrophytic Vegetation Present? Yes X	No		1. (1.	011	14
Hydric Soil Present? Yes X	No			e Sampled n a Wetlan	
Wetland Hydrology Present? Yes X	No		WILIII	ii a vveliai	iur res <u>~ No</u>
Remarks:					
*Extreme drought conditions (droughtmonitor.unl. receive groundwater from up gradient of sampling long:-102.596661), identical to SP-17 in vegetatio VEGETATION – Use scientific names of pla	point. SP-1 n, hydric soil	7a ta	aken a	as a verific	cation/duplicate soil pit on a transect
VEGETATION OSC SOICHMIO HAMICS OF PIC	Absolute	Dom	ninant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 Ft radius	% Cover				Number of Dominant Species
1					That Are OBL, FACW, or FAC
2					(excluding FAC-): 1 (A)
3					Total Number of Dominant Species Across All Strata: (B)
4		_			Species Across All Strata: 1 (B)
Sapling/Shrub Stratum (Plot size: 15 Ft radius)	0				Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)
1 2					Prevalence Index worksheet:
3.					Total % Cover of: Multiply by:
4					OBL species x 1 =
5					FACW species 95 x 2 = 190
	0	= Tota	al Cov	er	FAC species x 3 =
Herb Stratum (Plot size: 5 Ft radius) 1 Distichlis spicata	0.E	V		FACW	FACU species x 4 =
Disticting spicata Thinopyrum intermedium	95 5	N		UPL	UPL species $\frac{5}{100}$ $x = \frac{25}{215}$ (B)
	<u> </u>			<u> </u>	Column Totals (A) (B)
3					Prevalence Index = B/A = 2.15
5		-			Hydrophytic Vegetation Indicators:
6					X 1 - Rapid Test for Hydrophytic Vegetation
7					X 2 - Dominance Test is >50%
8.					X 3 - Prevalence Index is ≤3.0 ¹
9					4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
10					Problematic Hydrophytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size: 40)			al Cov	er	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1					
2	•		al 0 :		Hydrophytic Vegetation
% Bare Ground in Herb Stratum 0		- 10ta	al Cov	eı	Present? Yes X No
Remarks:	D5 - FAC Neut	ral Test fo	or hydrolo	gy. Drop all FAC,	cross examine all other dominants. If > 50% remaining are FACW to OBL, then YES to D5.

Profile Desc	ription: (Describe	to the depth	needed to docur	nent the i	ndicator	or confirn	n the absence of	indicators.)
Depth	Matrix			x Feature				•
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-16	10YR 4/2	95 7	.5YR 4/4	5	С	PL	clay loam	
								_
		 						
								
	=				-			
	oncentration, D=Dep					ed Sand G		ion: PL=Pore Lining, M=Matrix. r Problematic Hydric Soils ³ :
-	Indicators: (Applic	able to all LR						•
Histosol	` '			Sleyed Ma	. ,			ck (A9) (LRR I, J)
Black Hi	oipedon (A2)			Redox (S5 I Matrix (S				airie Redox (A16) (LRR F, G, H) face (S7) (LRR G)
	n Sulfide (A4)			Mucky Mi				ns Depressions (F16)
	d Layers (A5) (LRR l	F)		Gleyed Ma			_	H outside of MLRA 72 & 73)
	ick (A9) (LRR F, G ,	,	- ·	d Matrix (. ,		`	Vertic (F18)
	d Below Dark Surfac			Dark Surfa	,			ent Material (TF2)
Thick Da	ark Surface (A12)		Deplete	d Dark Su	ırface (F7)		illow Dark Surface (TF12)
-	lucky Mineral (S1)			Depressio				kplain in Remarks)
	Aucky Peat or Peat (essions (F			hydrophytic vegetation and
5 cm Mu	icky Peat or Peat (S	3) (LRR F)	(ML	RA 72 & '	73 of LRF	R H)		nydrology must be present,
Dantulation I	(:f						unless di	sturbed or problematic.
_	_ayer (if present):							
Type:			_					40 V V N
Depth (inc	ches):		_				Hydric Soil Pr	resent? Yes X No No No
Remarks:			1 4			1.4		0047
transect to v		out this featu	re both upgradie	ent to bo	undary, a	and to we	stern boundary.	SP17a is a duplicate pit, dug as a
liansect to v	Territy Solis.							
HYDROLO	GY							
	drology Indicators:							
_	cators (minimum of o		check all that apply	v)			Secondary	Indicators (minimum of two required)
-	Water (A1)	ono roquirou, c	Salt Crust			<u> </u>	-	e Soil Cracks (B6)
	iter Table (A2)		Aquatic Inv		e (B13)			ely Vegetated Concave Surface (B8)
Saturation			Hydrogen		, ,			ige Patterns (B10)
	arks (B1)		Dry-Seaso			١	· 	ed Rhizospheres on Living Roots (C3)
	nt Deposits (B2)		X Oxidized F					ere tilled)
	posits (B3)			not tilled)		ing receio		sh Burrows (C8)
-	at or Crust (B4)		Presence	,		4)		tion Visible on Aerial Imagery (C9)
_	oosits (B5)		Thin Muck			• /	· 	orphic Position (D2)
-	on Visible on Aerial	Imagery (B7)	Other (Exp				· 	leutral Test (D5)
	tained Leaves (B9)							Heave Hummocks (D7) (LRR F)
Field Obser	, ,							(, (,
Surface Water		es No	X Depth (inc	ches):				
Water Table			X Depth (inc					
							and Hydrology F	Present? Yes <u>×</u> No
Saturation Pi (includes cap		⊂o INO	X Depth (inc	JIICS)		_ well	and riyurology F	1636Ht: 163 ^ NO
Describe Re	corded Data (stream	n gauge, monit	oring well, aerial p	ohotos, pr	evious ins	spections),	if available:	
Remarks:								
In an averag	ge precipitation ye	ar expected	to have saturati	on prese	nt also.			
Ì	•	•		=				

Project/Site: US 287 Lamar Bypass		City/Cou	nty: Prowers 0	County S	Sampling Date: <u>12/11/12</u>
				State: CO	Sampling Point: SP-18
Investigator(s): T. Demasters,		Section,	Township, Ra	nge: Section 20, Township	22 South, Range 46 West
				convex, none): slightly conv	
Subregion (LRR): G- Western Great Plains	Lat: <u>38.1</u>	115892		Long: -102.596723	Datum: NAD 83
Soil Map Unit Name: Nepesta clay loam, 1 to 3 percent slop	oes			NWI classificat	
Are climatic / hydrologic conditions on the site typical for the	is time of yea	ar? Yes	No _x	(If no, explain in Rer	marks.)
Are Vegetation, Soil, or Hydrology	significantly	disturbed	d? Are '	"Normal Circumstances" pre	esent? Yes X No
Are Vegetation, Soil, or Hydrology	naturally pro	blematic	:? (If ne	eeded, explain any answers	in Remarks.)
SUMMARY OF FINDINGS – Attach site map	showing	samp	ling point l	ocations, transects,	important features, etc.
Hydrophytic Vegetation Present? Yes N	No X			I Amar	
Hydric Soil Present? Yes N			the Sampled		No X
Wetland Hydrology Present? Yes N	No x	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	rithin a Wetlar	id: Tes	No <u>×</u>
Remarks:		·			
*Extreme drought conditions (droughtmonitor.unl.ec Vista Del Rio Ditch - up gradient from ditch. SP-18 VEGETATION – Use scientific names of plan	paired upla	and for S	SP17.		
	Absolute	Domina	ant Indicator	Dominance Test worksl	neet:
Tree Stratum (Plot size: 30 Ft radius)			s? Status	Number of Dominant Spe	
1				That Are OBL, FACW, or	FAC
2				(excluding FAC-):	<u>1</u> (A)
3				Total Number of Dominar	nt 2
4				Species Across All Strata	a: <u>2</u> (B)
Sapling/Shrub Stratum (Plot size: 15 Ft radius)		= Total (Percent of Dominant Spe That Are OBL, FACW, or	
1 2				Prevalence Index works	sheet:
3.				Total % Cover of:	Multiply by:
4				OBL species	
5.				FACW species 25	
	0	= Total (Cover	FAC species 10	x 3 = <u>30</u>
Herb Stratum (Plot size: 5 Ft radius)					x 4 =
1. Thinopyrum intermedium	60	Υ	UPL	UPL species 60	x 5 = <u>300</u>
2. Distichlis spicata	25	Υ	FACW	Column Totals: 95	(A) <u>380</u> (B)
3. Agrostis stolonifera	10	N	FAC	Prevalence Index =	= B/A = 4.00
4				Hydrophytic Vegetation	
5				1 - Rapid Test for Hy	drophytic Vegetation
6				2 - Dominance Test i	s are FACW and/or OBL.
7				3 - Prevalence Index	
8				4 - Morphological Ad	aptations ¹ (Provide supporting
9 10					or on a separate sheet)
10.	0.5	= Total (Cover	Problematic Hydroph	nytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size: 40)				¹ Indicators of hydric soil a be present, unless disturb	and wetland hydrology must bed or problematic.
2				Hydrophytic	
	0	= Total (Cover	Vegetation	No _ ^X
% Bare Ground in Herb Stratum 5					
Remarks:	D5 - FAC Neut	tral Test for hy	drology. Drop all FAC,	, cross examine all other dominants. If > 50%	% remaining are FACW to OBL, then YES to D5.

	cription: (Describe	to the depth r				or confi	rm the absence	of indicators.)
Depth (inches)	Matrix Color (moist)	<u></u> %	Redo	ox Feature: %	s Type ¹	_Loc ²	_ Texture	Remarks
0-12	10YR 4/3	_ <u>%</u>	COIOI (IIIOISI)		<u>i ype</u>	LUC	silty loam	iveillaik?
0 12	1011(4/0						_ Sifty localli	
							_	
-								
							_	
1- 0.0							21	
	oncentration, D=Deployment Indicators: (Application)					ed Sand (ation: PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ :
Histoso		cable to all Liv	Sandy					fuck (A9) (LRR I, J)
l —	pipedon (A2)		Sandy					Prairie Redox (A16) (LRR F, G, H)
Black H				d Matrix (S				urface (S7) (LRR G)
Hydroge	en Sulfide (A4)			Mucky Mir	,			lains Depressions (F16)
Stratifie	d Layers (A5) (LRR	F)	Loamy	Gleyed Ma	atrix (F2)		(LR	R H outside of MLRA 72 & 73)
	uck (A9) (LRR F, G ,	,		ed Matrix (I	,			ed Vertic (F18)
	d Below Dark Surface	ce (A11)		Dark Surfa	. ,			arent Material (TF2)
	ark Surface (A12) Mucky Mineral (S1)			ed Dark Su Depression)		hallow Dark Surface (TF12) (Explain in Remarks)
	Mucky Peat or Peat	(S2) (LRR G. F				16)		of hydrophytic vegetation and
	ucky Peat or Peat (S	, , ,	, <u> </u>	RA 72 & 7				d hydrology must be present,
								disturbed or problematic.
Restrictive	Layer (if present):							
Type:			_					
Depth (in	ches):		_				Hydric Soil	Present? Yes No _x
Remarks:								
HYDROLO	GY							
Wetland Hy	drology Indicators	:						
Primary Indi	cators (minimum of	one required; c	heck all that app	ly)			Seconda	ry Indicators (minimum of two required)
Surface	Water (A1)		Salt Crus	t (B11)			Surfa	ace Soil Cracks (B6)
	ater Table (A2)		Aquatic Ir	vertebrate	s (B13)			rsely Vegetated Concave Surface (B8)
Saturati	on (A3)		Hydrogen	Sulfide O	dor (C1)		Draii	nage Patterns (B10)
Water N	/larks (B1)		Dry-Seas	on Water T	Table (C2)		Oxid	lized Rhizospheres on Living Roots (C3)
Sedime	nt Deposits (B2)		Oxidized	Rhizosphe	res on Liv	ing Root	s (C3) (w	here tilled)
Drift De	posits (B3)		(where	not tilled)			Cray	fish Burrows (C8)
Algal M	at or Crust (B4)		Presence	of Reduce	ed Iron (C4	4)	Satu	ration Visible on Aerial Imagery (C9)
1	posits (B5)		Thin Muc					morphic Position (D2)
	ion Visible on Aerial	Imagery (B7)	Other (Ex	plain in Re	emarks)			-Neutral Test (D5)
	Stained Leaves (B9)						Fros	t-Heave Hummocks (D7) (LRR F)
Field Obser			V					
Surface Wat			X Depth (ir					
Water Table			X Depth (ir					
Saturation F (includes ca	Present? pillary fringe)	Yes No	X Depth (ir	nches):		We	tland Hydrology	y Present? Yes No _x
	ecorded Data (stream	n gauge, monito	oring well, aerial	photos, pr	evious ins	pections), if available:	
Remarks:						·		
No hydrolog	gy present.							
<u></u>								

Project/Site: US 287 Lamar Bypass		City/County	rowers 0	County	_ Sampling	Date: 12/11/1	2
				State: CO			
Investigator(s): T. Demasters,		Section, To	wnship, Ra	inge: Section 19, Townsh	nip 22 South,	, Range 46 We	est
Landform (hillslope, terrace, etc.): Shelf				-			
Subregion (LRR): G- Western Great Plains	Lat: 38.	12255		Long: -102.617009		Datum: NAI	D 83
Soil Map Unit Name: Rocky Ford Clay Loam, 0-1 % Slopes				NWI classif			
Are climatic / hydrologic conditions on the site typical for thi							
Are Vegetation, Soil, or Hydrologys						′es ^X N	0
Are Vegetation, Soil, or Hydrology r				eeded, explain any answ			
SUMMARY OF FINDINGS – Attach site map							s, etc.
Hydrophytic Vegetation Present? Yes x N Hydric Soil Present? Yes x N Wetland Hydrology Present? Yes x N	lo		ne Sampled nin a Wetlar		No _		
Remarks: *Extreme drought conditions (droughtmonitor.unl.ed Amity Canal north portion.							
VEGETATION – Use scientific names of plan				_			
<u>Tree Stratum</u> (Plot size: <u>30 Ft radius</u>) 1		Species?		Dominance Test wor Number of Dominant S That Are OBL, FACW (excluding FAC-):	Species , or FAC	2	(A)
2				Total Number of Domi		2	(B)
4		= Total Co			_		(5)
Sapling/Shrub Stratum (Plot size: 15 Ft radius) 1		- 10tal 00	VCI	Percent of Dominant S That Are OBL, FACW	, or FAC: _	100	(A/B)
2				Prevalence Index wo	rksheet:		
3.				Total % Cover of:			
4				OBL species			
5				FACW species			-
5 Ft radius	0	= Total Co	ver	FACUL appeirs 60			_
Herb Stratum (Plot size: 5 Ft radius) 1 Echinochloa crus-galli	40	Υ	FAC	FACU species			_
Rumex venosus	20	Y	FAC	Column Totals: 60			(B)
3	_				, ,		_ (-/
4				Prevalence Inde	_		
5				Hydrophytic Vegetat 1 - Rapid Test for X 2 - Dominance Te	Hydrophytic	Vegetation	
8.				X 3 - Prevalence Inc			
9				4 - Morphological data in Remar	Adaptations ks or on a se	s' (Provide sup eparate sheet)	porting
10				Problematic Hydro			
Woody Vine Stratum (Plot size: 40		= Total Co		¹ Indicators of hydric so be present, unless dis	oil and wetla	nd hydrology i	
1				Hydrophytic Vegetation Present? Y	es <u>×</u>	No	
Remarks: Sandy bare soil, vegetation patchy.	D5 - FAC Neu	tral Test for hydrol	ogy. Drop all FAC,	, cross examine all other dominants. If :	> 50% remaining are	e FACW to OBL, then	YES to D5.

	Matrix Color (moist)	%	Color (moist)	ox Feature %	es Type ¹	Loc ²	Texture	Remarks
(inches) 0-7	10YR 6/2	40	10YR 6/1		D Type	M	sand	Remarks
<u> </u>	10YR 4/1	10	10YR 4/6	- 10 5	- C	M	sandy loam	
7.40	· -					IVI	· -	
7-16	10YR 6/2	70	7.5YR 5/8	30	_		sandy loam	
							·	
					_			
• •			M=Reduced Matrix, C			ed Sand G		ion: PL=Pore Lining, M=Matrix. r Problematic Hydric Soils³:
Histoso		icable to a		Gleyed M				ck (A9) (LRR I, J)
	Epipedon (A2)		X Sandy					airie Redox (A16) (LRR F, G, H)
	listic (A3)			ed Matrix (face (S7) (LRR G)
	en Sulfide (A4)				ineral (F1)			ns Depressions (F16)
	ed Layers (A5) (LRR		Loamy	Gleyed M	latrix (F2)		(LRR	H outside of MLRA 72 & 73)
	uck (A9) (LRR F, G			ed Matrix	. ,			Vertic (F18)
	ed Below Dark Surfa	ace (A11)		Dark Sur				ent Material (TF2)
	Oark Surface (A12) Mucky Mineral (S1)			ed Dark S Depressi	urface (F7)		llow Dark Surface (TF12) splain in Remarks)
	Mucky Peat or Peat				ressions (F	16)		hydrophytic vegetation and
	ucky Peat or Peat (73 of LRF			ydrology must be present,
	(/ ((,		sturbed or problematic.
lestrictive	Layer (if present):							
Type:								
Depth (ir	nches):						Hydric Soil Pr	resent? Yes × No
	nches):						Hydric Soil Pr	resent? Yes <u>×</u> No
Depth (ir	nches):						Hydric Soil Pr	resent? Yes <u>×</u> No
Depth (ir							Hydric Soil Pr	resent? Yes <u>×</u> No
Depth (in Remarks:							Hydric Soil Pr	resent? Yes <u>×</u> No
Depth (in Remarks: YDROLO	OGY ydrology Indicators	s:	red; check all that app	oly)				
Depth (in Remarks: YDROLO Wetland Hy Primary Ind	OGY ydrology Indicators	s:					Secondary	Indicators (minimum of two required e Soil Cracks (B6)
Depth (in Remarks: YDROLO Wetland Hy Primary Ind Surface	OGY ydrology Indicators icators (minimum of	s:	red; check all that app		es (B13)		Secondary Surfac	Indicators (minimum of two required
Depth (in Permarks: YDROLO Wetland Hy Primary Ind Surface High W	OGY ydrology Indicators icators (minimum of e Water (A1)	s:	red; check all that app Salt Crus Aquatic Ir	t (B11)			Secondary Surfac Sparse	Indicators (minimum of two required e Soil Cracks (B6)
Depth (in Permarks: YDROLO Wetland Hy Primary Ind Surface High W Saturat	OGY ydrology Indicators icators (minimum of e Water (A1) later Table (A2)	s:	red; check all that app Salt Crus Aquatic Ir Hydroger	it (B11) nvertebrat n Sulfide 0			Secondary Surfac Sparse Draina	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10)
Depth (in Permarks: YDROLO Wetland Hy Primary Ind Surface High W Saturat Water I	OGY ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3)	s:	red; check all that app Salt Crus Aquatic Ir Hydroger	it (B11) nvertebrat n Sulfide C son Water	odor (C1) Table (C2)		Secondary Surfac X Sparse Draina Oxidize	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10)
Depth (in Remarks: YDROLO Wetland Hy Primary Ind Surface High W Saturat Water I X Sedime	ody ydrology Indicators icators (minimum of water (A1) ydter Table (A2) ion (A3) Marks (B1)	s:	red; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized	it (B11) nvertebrat n Sulfide C son Water	odor (C1) Table (C2) eres on Liv		Secondary Surfac X Sparse Draina Oxidize (C3) (whe	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3
Depth (in Remarks: YDROLO Wetland Hy Primary Ind Surface High W Saturat Water I X Sedime Drift De	ody ydrology Indicators icators (minimum of water (A1) fater Table (A2) ion (A3) Marks (B1) ent Deposits (B2)	s:	red; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized	t (B11) nvertebrat n Sulfide C son Water Rhizosph not tilled	Odor (C1) Table (C2) eres on Liv	ring Roots	Secondary Surfac X Sparse Draina Oxidize (C3) (whe	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Care tilled)
Primary Ind Saturat Water I X Sedime Algal M	ydrology Indicators icators (minimum of w Water (A1) dater Table (A2) ion (A3) Warks (B1) ent Deposits (B2) eposits (B3)	s:	red; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized (where	t (B11) nvertebrat n Sulfide C son Water Rhizosph not tilled	Odor (C1) Table (C2) eres on Liv) ed Iron (C	ring Roots	Secondary Surfac X Sparse Draina Oxidize (C3) (whe	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Care tilled)
Depth (in Remarks: YDROLO Wetland Hy Primary Ind Surface High W Saturat Water I X Sedime Drift De Algal W Iron De	ydrology Indicators icators (minimum of water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4)	s: one requir	red; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized (where Presence Thin Muc	t (B11) nvertebrat n Sulfide C con Water Rhizosph not tilled e of Reduce k Surface	Odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7)	ring Roots	Secondary Surface X Sparse Draina Oxidize (C3) (whe Crayfis Satura X Geome	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 ere tilled) sh Burrows (C8) tion Visible on Aerial Imagery (C9)
Depth (in Remarks: YDROLO Wetland Hy Primary Ind Surface High W Saturat Water I X Sedime Drift De Algal M Iron De Inundar Water-	ydrology Indicators icators (minimum of w Water (A1) fater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9)	s: one requir	red; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized (where Presence Thin Muc	t (B11) nvertebrat n Sulfide C con Water Rhizosph not tilled e of Reduce k Surface	Odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7)	ring Roots	Secondary Surfac X Sparse Draina Oxidize (C3) (whe Crayfis Satura X Geome X FAC-N	Indicators (minimum of two required e Soil Cracks (B6) Ply Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3) ere tilled) sh Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2)
Depth (in Remarks: YDROLO Wetland Hy Primary Ind Surface High W Saturat Water I X Sedime Drift De Algal M Iron De Inundar Water-G	ydrology Indicators icators (minimum of w Water (A1) fater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9)	s: one requir I Imagery (red; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized (where Presence Thin Muc	ot (B11) Invertebrat In Sulfide Con Water Rhizosph In Tilled In Grand tilled I	Odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7) emarks)	ing Roots	Secondary Surfac X Sparse Draina Oxidize (C3) (whe Crayfis Satura X Geome X FAC-N	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Care tilled) eh Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2) leutral Test (D5)
Depth (in Remarks: YDROLO Wetland Hy Primary Ind Surface High W Saturat Water I X Sedime Drift De Algal M Iron De Inundar Water-G	ody Idrology Indicators Icators (minimum of Water (A1) Idater Table (A2) Ion (A3) Marks (B1) Int Deposits (B2) Int Deposits (B3) Idat or Crust (B4) Interposits (B5) Ition Visible on Aeria Stained Leaves (B9) Interpresent?	s: fone required in the second	red; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized (where Presence Thin Muc (B7) Other (Ex	ot (B11) Invertebrat In Sulfide Con Water Rhizosph Inot tilled It of Reduct It Surface Replain in R	Odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7) emarks)	ing Roots 4)	Secondary Surfac X Sparse Draina Oxidize (C3) (whe Crayfis Satura X Geome X FAC-N	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Care tilled) eh Burrows (C8) tion Visible on Aerial Imagery (C9) prephic Position (D2) leutral Test (D5)
Depth (in Remarks: YDROLO Wetland Hy Primary Ind Surface High W Saturat Water I X Sedime Drift De Algal M Iron De Inundat Water-S Field Obse	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9) rvations: ter Present?	I Imagery () Yes	red; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized (where Presence Thin Muc (B7) Other (Ex	at (B11) an vertebrat an Sulfide Coon Water Rhizosph and tilled a of Reduce k Surface explain in R anches): anches):	Odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7) emarks)	ring Roots 4)	Secondary Surfac X Sparse Draina Oxidize (C3) (whe Crayfis Satura X Geome X FAC-N Frost-F	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Care tilled) eh Burrows (C8) tion Visible on Aerial Imagery (C9) preprice Position (D2) leutral Test (D5) Heave Hummocks (D7) (LRR F)
Depth (in Remarks: YDROLO Wetland Hy Primary Ind Surface High W Saturat Water I X Sedime Drift De Inundat Water-steld Obse Surface Water Table Saturation Fincludes ca	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9) rvations: ter Present? e Present? epillary fringe)	s: fone require I Imagery () Yes Yes Yes	red; check all that approximate approximat	ot (B11) Invertebrat In Sulfide Con Water Rhizosph Inot tilled It of Reduct Red	Odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7) emarks)	ring Roots 4) Wet	Secondary Surface X Sparse Draina Oxidize (C3) (whe Satura X Geome X FAC-N Frost-H	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Care tilled) eh Burrows (C8) tion Visible on Aerial Imagery (C9) orphic Position (D2) leutral Test (D5) Heave Hummocks (D7) (LRR F)
Depth (in Remarks: YDROLO Wetland Hy Primary Ind Surface High W Saturat Water I X Sedime Drift De Inundat Water-steld Obse Surface Water Table Saturation Fincludes ca	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9) rvations: ter Present? e Present? epillary fringe)	s: fone require I Imagery () Yes Yes Yes	red; check all that app Salt Crus Aquatic Ir Hydroger Dry-Seas Oxidized (where Presence Thin Muc (B7) Other (Ex	ot (B11) Invertebrat In Sulfide Con Water Rhizosph Inot tilled It of Reduct Red	Odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7) emarks)	ring Roots 4) Wet	Secondary Surface X Sparse Draina Oxidize (C3) (whe Satura X Geome X FAC-N Frost-H	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Care tilled) eh Burrows (C8) tion Visible on Aerial Imagery (C9) preprice Position (D2) leutral Test (D5) Heave Hummocks (D7) (LRR F)
Depth (in Remarks: YDROLO Wetland Hy Primary Ind Surface High W Saturat Water I X Sedime Drift De Inundat Water-steld Obse Surface Water Table Saturation Fincludes ca	ydrology Indicators icators (minimum of e Water (A1) later Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) tion Visible on Aeria Stained Leaves (B9) rvations: ter Present? e Present? epillary fringe)	s: fone require I Imagery () Yes Yes Yes	red; check all that approximate approximat	ot (B11) Invertebrat In Sulfide Con Water Rhizosph Inot tilled It of Reduct Red	Odor (C1) Table (C2) eres on Liv) ed Iron (C- (C7) emarks)	ring Roots 4) Wet	Secondary Surface X Sparse Draina Oxidize (C3) (whe Satura X Geome X FAC-N Frost-H	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Care tilled) eh Burrows (C8) tion Visible on Aerial Imagery (C9) prephic Position (D2) leutral Test (D5)

Project/Site: US 287 Lamar Bypass	c	City/Co	unty: _	Prowers C	County Sampling Date: 12/11/12
Applicant/Owner: CDOT					State: CO Sampling Point: SP-20
Investigator(s): T. Demasters,		Section	n, Towi	nship, Ra	nge: Section 19, Township 22 South, Range 46 West
					convex, none): flat Slope (%): 0
Subregion (LRR): G- Western Great Plains					
Soil Map Unit Name: Rocky Ford Clay Loam, 0-1 % Slope					NWI classification: R40WKF
Are climatic / hydrologic conditions on the site typical for					
Are Vegetation, Soil, or Hydrology					'Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology	_ naturally prob	olemati	ic?	(If ne	eeded, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site ma	p showing	samp	pling	point le	ocations, transects, important features, etc
Hydrophytic Vegetation Present? Yes	No X		la tha	Sampled	l Area
Hydric Soil Present? Yes				a Wetlar	
Wetland Hydrology Present? Yes	No <u>x</u>		***************************************	a wettai	165 165
*Extreme drought conditions (droughtmonitor.unl.d Amity Canal central portion. Upland paired with S VEGETATION – Use scientific names of plants o	P19 and SP2	21. Or	n banl	K.	
-		Domir	nant li	ndicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 Ft radius	% Cover				Number of Dominant Species
1					That Are OBL, FACW, or FAC
2					(excluding FAC-): 1 (A)
3					Total Number of Dominant Species Across All Strata: 3 (B)
4					Species Across All Strata: 3 (B)
Sapling/Shrub Stratum (Plot size: 15 Ft radius)	0 =			r	Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)
1 2					Prevalence Index worksheet:
3.					Total % Cover of: Multiply by:
4.					OBL species x 1 =
5					FACW species $\underline{20}$ $\times 2 = \underline{40}$
	0 =	= Total	I Cove	r	FAC species x 3 =
Herb Stratum (Plot size: 5 Ft radius)	45	V		IDI	FACU species x 4 =
Kochia scoparia Helianthus pumilus	<u>15</u>	Y		JPL JPL	UPL species $\underline{20}$ $x = \underline{100}$ (B)
2. Distichlis spicata	20	<u>Y</u>		FACW	Column Totals: <u>40</u> (A) <u>140</u> (B)
<u> </u>				ACW	Prevalence Index = B/A = 3.50
4					Hydrophytic Vegetation Indicators:
5 6					1 - Rapid Test for Hydrophytic Vegetation
7					All dominants are FACW and/or OBL. 2 - Dominance Test is >50%
8.					3 - Prevalence Index is ≤3.0 ¹
9.					4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
10.					Problematic Hydrophytic Vegetation ¹ (Explain)
	40	= Total	I Cove	r	
Woody Vine Stratum (Plot size: 60) 1					¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2					Hydrophytic
% Bare Ground in Herb Stratum 60	=	= Total	I Cove	r	Vegetation Present? Yes No X
Remarks:	D5 - FAC Noutr	al Test for I	hydrology	. Drop all FAC	cross examine all other dominants. If > 50% remaining are FACW to OBL, then YES to D5
			,	,	

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

Histic Epipedon (A2) Sand Strip Black Histic (A3) Strip Hydrogen Sulfide (A4) Loan Stratified Layers (A5) (LRR F) Loan 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A11) Redo Thick Dark Surface (A12) Depleted Sandy Mucky Mineral (S1) Redo 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) High 5 cm Mucky Peat or Peat (S3) (LRR F) (Compared to the compared to the com	CS=Covered or Coated	Indicators for Problematic Hydric Soils ³ : 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) Reduced Vertic (F18) Red Parent Material (TF2) Very Shallow Dark Surface (TF12) Other (Explain in Remarks) Indicators of hydrophytic vegetation and
¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, Hydric Soil Indicators: (Applicable to all LRRs, unless of Histosol (A1) Sanc Black Histic (A3) Strip Hydrogen Sulfide (A4) Loan Stratified Layers (A5) (LRR F) Loan 1 cm Muck (A9) (LRR F, G, H) Depl Depleted Below Dark Surface (A11) Redc Thick Dark Surface (A12) Depl Sandy Mucky Mineral (S1) Redc 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) High 5 cm Mucky Peat or Peat (S3) (LRR F) (Restrictive Layer (if present): Type: Depth (inches): Remarks: HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that a Surface Water (A1) Salt Cri Aquatic	therwise noted.) dy Gleyed Matrix (S4) dy Redox (S5) ped Matrix (S6) ny Mucky Mineral (F1) ny Gleyed Matrix (F2) eted Matrix (F3) ox Dark Surface (F6) eted Dark Surface (F7) ox Depressions (F8) Plains Depressions (F16)	d Sand Grains. 2 Location: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils3: 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) Reduced Vertic (F18) Red Parent Material (TF2) Very Shallow Dark Surface (TF12) Other (Explain in Remarks) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
Hydric Soil Indicators: (Applicable to all LRRs, unless of Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) High 5 cm Mucky Peat or Peat (S3) (LRR F) Restrictive Layer (if present): Type: Depth (inches): Remarks: YDROLOGY	therwise noted.) dy Gleyed Matrix (S4) dy Redox (S5) ped Matrix (S6) ny Mucky Mineral (F1) ny Gleyed Matrix (F2) eted Matrix (F3) ox Dark Surface (F6) eted Dark Surface (F7) ox Depressions (F8) Plains Depressions (F16)	Indicators for Problematic Hydric Soils ³ : 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16)
Hydric Soil Indicators: (Applicable to all LRRs, unless of Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) High 5 cm Mucky Peat or Peat (S3) (LRR F) Restrictive Layer (if present): Type: Depth (inches): Remarks: YDROLOGY	therwise noted.) dy Gleyed Matrix (S4) dy Redox (S5) ped Matrix (S6) ny Mucky Mineral (F1) ny Gleyed Matrix (F2) eted Matrix (F3) ox Dark Surface (F6) eted Dark Surface (F7) ox Depressions (F8) Plains Depressions (F16)	Indicators for Problematic Hydric Soils ³ : 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16)
Hydric Soil Indicators: (Applicable to all LRRs, unless of Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) 5 cm Mucky Peat or Peat (S3) (LRR F) Restrictive Layer (if present): Type: Depth (inches): Remarks: Primary Indicators (minimum of one required; check all that a Surface Water (A1) High Water Table (A2) Sandy Aquatic	therwise noted.) dy Gleyed Matrix (S4) dy Redox (S5) ped Matrix (S6) ny Mucky Mineral (F1) ny Gleyed Matrix (F2) eted Matrix (F3) ox Dark Surface (F6) eted Dark Surface (F7) ox Depressions (F8) Plains Depressions (F16)	Indicators for Problematic Hydric Soils ³ : 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16)
Hydric Soil Indicators: (Applicable to all LRRs, unless of Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) High 5 cm Mucky Peat or Peat (S3) (LRR F) Restrictive Layer (if present): Type: Depth (inches): Remarks: Primary Indicators (minimum of one required; check all that a Surface Water (A1) High Water Table (A2) Aquatic	therwise noted.) dy Gleyed Matrix (S4) dy Redox (S5) ped Matrix (S6) ny Mucky Mineral (F1) ny Gleyed Matrix (F2) eted Matrix (F3) ox Dark Surface (F6) eted Dark Surface (F7) ox Depressions (F8) Plains Depressions (F16)	Indicators for Problematic Hydric Soils ³ : 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16)
Hydric Soil Indicators: (Applicable to all LRRs, unless of Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) High 5 cm Mucky Peat or Peat (S3) (LRR F) Restrictive Layer (if present): Type: Depth (inches): Remarks: Primary Indicators (minimum of one required; check all that a Surface Water (A1) High Water Table (A2) Aquatic	therwise noted.) dy Gleyed Matrix (S4) dy Redox (S5) ped Matrix (S6) ny Mucky Mineral (F1) ny Gleyed Matrix (F2) eted Matrix (F3) ox Dark Surface (F6) eted Dark Surface (F7) ox Depressions (F8) Plains Depressions (F16)	Indicators for Problematic Hydric Soils ³ : 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16)
Hydric Soil Indicators: (Applicable to all LRRs, unless of Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) 5 cm Mucky Peat or Peat (S3) (LRR F) Restrictive Layer (if present): Type: Depth (inches): Remarks: Primary Indicators (minimum of one required; check all that a Surface Water (A1) High Water Table (A2) Sandy Aquatic	therwise noted.) dy Gleyed Matrix (S4) dy Redox (S5) ped Matrix (S6) ny Mucky Mineral (F1) ny Gleyed Matrix (F2) eted Matrix (F3) ox Dark Surface (F6) eted Dark Surface (F7) ox Depressions (F8) Plains Depressions (F16)	Indicators for Problematic Hydric Soils ³ : 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16)
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Hydric Soil Indicators: (Applicable to all LRRs, unless of Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) 5 cm Mucky Peat or Peat (S3) (LRR F) Restrictive Layer (if present): Type: Depth (inches): Remarks: Primary Indicators (minimum of one required; check all that a Surface Water (A1) High Water Table (A2) Sandy Aquatic	therwise noted.) dy Gleyed Matrix (S4) dy Redox (S5) ped Matrix (S6) ny Mucky Mineral (F1) ny Gleyed Matrix (F2) eted Matrix (F3) ox Dark Surface (F6) eted Dark Surface (F7) ox Depressions (F8) Plains Depressions (F16)	Indicators for Problematic Hydric Soils ³ : 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16)
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Hydric Soil Indicators: (Applicable to all LRRs, unless of Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) (LRR F) 1 cm Muck (A9) (LRR F, G, H) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) High 5 cm Mucky Peat or Peat (S3) (LRR F) Restrictive Layer (if present): Type: Depth (inches): Remarks: Primary Indicators (minimum of one required; check all that a Surface Water (A1) High Water Table (A2) Aquatic	therwise noted.) dy Gleyed Matrix (S4) dy Redox (S5) ped Matrix (S6) ny Mucky Mineral (F1) ny Gleyed Matrix (F2) eted Matrix (F3) ox Dark Surface (F6) eted Dark Surface (F7) ox Depressions (F8) Plains Depressions (F16	Indicators for Problematic Hydric Soils ³ : 1 cm Muck (A9) (LRR I, J) Coast Prairie Redox (A16) (LRR F, G, H) Dark Surface (S7) (LRR G) High Plains Depressions (F16)
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Histic Epipedon (A2) Sand Strip Black Histic (A3) Strip Hydrogen Sulfide (A4) Loan Stratified Layers (A5) (LRR F) Loan 1 cm Muck (A9) (LRR F, G, H) Depl Depleted Below Dark Surface (A11) Redo Thick Dark Surface (A12) Depl Sandy Mucky Mineral (S1) Redo 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) High 5 cm Mucky Peat or Peat (S3) (LRR F) (Restrictive Layer (if present): Type: Depth (inches): Permarks: Primary Indicators (minimum of one required; check all that a Surface Water (A1) Salt Cri High Water Table (A2) Aquatic	dy Redox (S5) ped Matrix (S6) ny Mucky Mineral (F1) ny Gleyed Matrix (F2) eted Matrix (F3) ox Dark Surface (F6) eted Dark Surface (F7) ox Depressions (F8) Plains Depressions (F16)	Coast Prairie Redox (A16) (LRR F, G, H Dark Surface (S7) (LRR G) High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) Reduced Vertic (F18) Red Parent Material (TF2) Very Shallow Dark Surface (TF12) Other (Explain in Remarks) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
Black Histic (A3) Strip Hydrogen Sulfide (A4) Loan Stratified Layers (A5) (LRR F) Loan 1 cm Muck (A9) (LRR F, G, H) Depl Depleted Below Dark Surface (A11) Redc Thick Dark Surface (A12) Depl Sandy Mucky Mineral (S1) Redc 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) High 5 cm Mucky Peat or Peat (S3) (LRR F) (Restrictive Layer (if present): Type: Depth (inches): Remarks: YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that a Surface Water (A1) Salt Cn High Water Table (A2) Aquatic	ped Matrix (S6) ny Mucky Mineral (F1) ny Gleyed Matrix (F2) eted Matrix (F3) ox Dark Surface (F6) eted Dark Surface (F7) ox Depressions (F8) Plains Depressions (F16)	Coast Prairie Redox (A16) (LRR F, G, H Dark Surface (S7) (LRR G) High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) Reduced Vertic (F18) Red Parent Material (TF2) Very Shallow Dark Surface (TF12) Other (Explain in Remarks) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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Hydrogen Sulfide (A4) Loan Stratified Layers (A5) (LRR F) Loan 1 cm Muck (A9) (LRR F, G, H) Depl Depleted Below Dark Surface (A11) Redo Thick Dark Surface (A12) Depl Sandy Mucky Mineral (S1) Redo 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) High 5 cm Mucky Peat or Peat (S3) (LRR F) (Restrictive Layer (if present): Type: Depth (inches): Remarks: YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that a grant and continued in the continued in t	ny Mucky Mineral (F1) ny Gleyed Matrix (F2) eted Matrix (F3) ox Dark Surface (F6) eted Dark Surface (F7) ox Depressions (F8) Plains Depressions (F16	— High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) — Reduced Vertic (F18) — 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.
Stratified Layers (A5) (LRR F) Loan 1 cm Muck (A9) (LRR F, G, H) Depl Depleted Below Dark Surface (A11) Redo Thick Dark Surface (A12) Depl Sandy Mucky Mineral (S1) Redo 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) High 5 cm Mucky Peat or Peat (S3) (LRR F) (Restrictive Layer (if present): Type: Depth (inches): Permarks: YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that a Surface Water (A1) Salt Cri High Water Table (A2) Aquatic	ny Gleyed Matrix (F2) eted Matrix (F3) ox Dark Surface (F6) eted Dark Surface (F7) ox Depressions (F8) Plains Depressions (F16	(LRR H outside of MLRA 72 & 73) Reduced Vertic (F18) Red Parent Material (TF2) Very Shallow Dark Surface (TF12) Other (Explain in Remarks) 3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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Thick Dark Surface (A12) Depl Sandy Mucky Mineral (S1) Redo 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) High 5 cm Mucky Peat or Peat (S3) (LRR F) (Restrictive Layer (if present): Type: Depth (inches): Permarks: YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that a Surface Water (A1) Salt Cri Aquatic	eted Dark Surface (F7) ox Depressions (F8) Plains Depressions (F16	Very Shallow Dark Surface (TF12) Other (Explain in Remarks) Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
Sandy Mucky Mineral (S1) Redo 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) High 5 cm Mucky Peat or Peat (S3) (LRR F) (Restrictive Layer (if present):	ox Depressions (F8) Plains Depressions (F16	Other (Explain in Remarks) 3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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Type: Depth (inches): Remarks: YDROLOGY		·
Type: Depth (inches): Remarks: YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that a Surface Water (A1) Salt Cn High Water Table (A2) Aquatic		Hydric Soil Present? Yes No _×
Depth (inches): Remarks: YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that a Surface Water (A1) Salt Cn High Water Table (A2) Aquatic		Hydric Soil Present? Yes No _x
Primary Indicators (minimum of one required; check all that a Surface Water (A1) High Water Table (A2) ADDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that a Salt Cri Aquatic		Hydric Soil Present? Yes No _x
YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that a Surface Water (A1) Salt Cri High Water Table (A2) Aquatic		
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that a Surface Water (A1) High Water Table (A2) Aquatic		
Primary Indicators (minimum of one required; check all that a Surface Water (A1) Salt Cri High Water Table (A2) Aquatic		
Surface Water (A1) Salt Cri High Water Table (A2) Aquatic		
High Water Table (A2) Aquatic	pply)	Secondary Indicators (minimum of two req
_ • · · ·	ust (B11)	Surface Soil Cracks (B6)
Saturation (A3) Hydrog	Invertebrates (B13)	Sparsely Vegetated Concave Surface
	en Sulfide Odor (C1)	Drainage Patterns (B10)
Water Marks (B1) Dry-Se	ason Water Table (C2)	Oxidized Rhizospheres on Living Roo
	ed Rhizospheres on Living	
	re not tilled)	Crayfish Burrows (C8)
	ce of Reduced Iron (C4)	
	uck Surface (C7)	Geomorphic Position (D2)
	Explain in Remarks)	FAC-Neutral Test (D5)
Water-Stained Leaves (B9)		Frost-Heave Hummocks (D7) (LRR F
Field Observations:		
Surface Water Present? Yes No X Depth	(inches):	_
Water Table Present? Yes No X Depth	(inches):	
(includes capillary fringe)	(inches):	_
Describe Recorded Data (stream gauge, monitoring well, aer	(inches):	_
		Wetland Hydrology Present? Yes No ×
Remarks:		Wetland Hydrology Present? Yes No ×
nomano.		Wetland Hydrology Present? Yes No ×
		Wetland Hydrology Present? Yes No ×
		Wetland Hydrology Present? Yes No ×
		Wetland Hydrology Present? Yes No ×

Project/Site: US 287 Lamar Bypass		(City/Co	unty: Prowers (County	Sampling Date: 12/11/12
Applicant/Owner: CDOT						Sampling Point: SP-21
Investigator(s): T. Demasters,		;	Section	, Township, Ra	inge: Section 19, Towns	hip 22 South, Range 46 West
Landform (hillslope, terrace, etc.): Shelf						Slope (%): 2
Subregion (LRR): G- Western Great Plain:						
Soil Map Unit Name: Rocky Ford clay loar						
Are climatic / hydrologic conditions on the						
Are Vegetation, Soil, or Hy						
Are Vegetation, Soil, or Hy	drology	_ naturally pro	blemati	c? (If ne	eeded, explain any answ	vers in Remarks.)
SUMMARY OF FINDINGS – Atta	ach site ma	p showing	samp	oling point l	ocations, transect	s, important features, etc.
Hydrophytic Vegetation Present?	Yes X	No	١.	s the Sampled	l Aron	
Hydric Soil Present?	Yes x	No		within a Wetlar		No
Wetland Hydrology Present?	Yes x	No		Within a Wethan		
Remarks:						
*Extreme drought conditions (drough Amity Canal - southwestern portion. Palustrine scrub-shrub wetland (PSS		edu)				
VEGETATION – Use scientific n	,	ants.				
		Absolute	Domir	nant Indicator	Dominance Test wo	rksheet:
Tree Stratum (Plot size: 30 Ft radius)	% Cover	Specie	es? Status	Number of Dominant	Species
1					That Are OBL, FACW (excluding FAC-):	/, or FAC (A)
2					,	
3					Total Number of Dom Species Across All St	0
4		•	= Total	Cover		,
Sapling/Shrub Stratum (Plot size: 15 F	t radius)		- Total	Covei	Percent of Dominant 3 That Are OBL, FACW	
1. Salix exigua		40	Υ	FACW		
2					Prevalence Index wo	Multiply by:
3						x 1 =
4			-			x 2 = 80
5		40	T.1.1	0	FAC species 25	
Herb Stratum (Plot size: 5 Ft radius)		= Total	Cover	FACU species	
		25	Υ	FAC	UPL species	x 5 =
2					Column Totals: 65	(A) <u>155</u> (B)
3					Prevalence Inde	ex = B/A = 2.38
4					Hydrophytic Vegetat	<u> </u>
5					1 - Rapid Test for	Hvdrophytic Vegetation
6					X 2 - Dominance Te	ninants are FACW and/or OBL. St is >50%
7 8					X 3 - Prevalence In	dex is ≤3.0 ¹
9						Adaptations ¹ (Provide supporting
10.						ks or on a separate sheet) ophytic Vegetation¹ (Explain)
		05	= Total	Cover		
Woody Vine Stratum (Plot size: 40)					oil and wetland hydrology must sturbed or problematic.
2					Hydrophytic	
0/ Barro Craum dia Harto Cr. 15		85	= Total	Cover	Vegetation Present? Y	'es ^X No
% Bare Ground in Herb Stratum 15 Remarks:		DS - EAC North	tral Toet for	hydrology Drop all EAC		> 50% remaining are FACW to OBL, then YES to D5.
Tomans.		Do - FAC Neut	ıaı restiofi	пучноюду. Бтор ан РАС,	, oross examine an other dominants. If	> 30 /0 remaining are FACVV to OBL, then TES to D5.

Depth	Matrix		pth needed to docu	ox Featur		or comm	ill the absence of i	ndicators.)
(inches)	Color (moist)	%	Color (moist)	<u>%</u>	Type ¹	Loc ²	Texture	Remarks
0-7	10YR 6/2	40	10YR 6/1	10	D	М	sand	
	10YR 4/1	45	10YR 4/6	5	C	М	sandy loam	
7-16	10YR 6/2	70	7.5YR 5/8	30			sandy loam	
7-10	10111 0/2		7.511(5/6				- Janay Ioani	
· 					_	-		
	-							
_					_			
¹ Type: C=0	Concentration, D=D	epletion, RN	/I=Reduced Matrix, C	S=Covere	ed or Coate	ed Sand 0		n: PL=Pore Lining, M=Matrix.
Hydric Soi	I Indicators: (App	licable to a	I LRRs, unless other	erwise no	ted.)		Indicators for	Problematic Hydric Soils ³ :
Histoso	` '			Gleyed M				(A9) (LRR I, J)
	Epipedon (A2)			Redox (S				rie Redox (A16) (LRR F, G, H)
	Histic (A3)			ed Matrix (ace (S7) (LRR G)
	gen Sulfide (A4)	D E\		-	ineral (F1)		_	s Depressions (F16)
	ed Layers (A5) (LRI			Gleyed M	, ,		,	l outside of MLRA 72 & 73)
	luck (A9) (LRR F, C			ed Matrix	` '			/ertic (F18)
	ed Below Dark Surf	ace (ATT)		Dark Surl	race (F6) urface (F7	`		nt Material (TF2) ow Dark Surface (TF12)
	Dark Surface (A12) Mucky Mineral (S1))		ed Dark S Depression	•	,		ow Dark Surrace (TFT2) blain in Remarks)
	Mucky Peat or Pea				ressions (F	16)		ydrophytic vegetation and
	lucky Peat or Peat				73 of LRF			drology must be present,
0 0.11 10	lucky i out of i out	(00) (21111)	, (···			,		turbed or problematic.
Restrictive	Layer (if present)	:						•
Type:								
Depth (ii	nches):						Hydric Soil Pre	sent? Yes X No
Remarks:							l	
HADBOLO	ncv.							
HYDROLO								
	ydrology Indicator		and the state of the state of	. 1 \			0	
	•	t one require	ed; check all that app					ndicators (minimum of two required)
	e Water (A1)		Salt Crus				· 	Soil Cracks (B6)
	/ater Table (A2)			nvertebrat			 ·	y Vegetated Concave Surface (B8)
	tion (A3)		Hydroger	n Sulfide C	Odor (C1)		Drainag	e Patterns (B10)
Water I	Marks (B1)				Table (C2)			d Rhizospheres on Living Roots (C3
Sedime	ent Deposits (B2)		Oxidized	Rhizosph	eres on Liv	ing Roots	s (C3) (wher	e tilled)
Drift De	eposits (B3)		(where	not tilled	1)		Crayfish	Burrows (C8)
Algal M	lat or Crust (B4)		Presence	of Reduc	ed Iron (C	4)	Saturati	on Visible on Aerial Imagery (C9)
Iron De	eposits (B5)		Thin Muc	k Surface	(C7)		X Geomor	phic Position (D2)
Inunda	tion Visible on Aeria	al Imagery (l	B7) Other (Ex	kplain in R	emarks)		X FAC-Ne	eutral Test (D5)
Water-	Stained Leaves (B9	9)					Frost-He	eave Hummocks (D7) (LRR F)
Field Obse	rvations:							
Surface Wa	ater Present?		No X Depth (in					
Water Table	e Present?	Yes	No X Depth (i	nches):				
Saturation F		Yes	No X Depth (in	nches):		We	tland Hydrology Pr	resent? Yes <u>×</u> No
	apillary fringe)	am gallaa n	anitaring wall paria	I nhoton n	rovious in	nootiona) if available:	
Describe R	ecorded Data (Strea	anı yauye, n	nonitoring well, aeria	ι μποιος, β	nevious ins	spections), ii avaliable.	
Domosto:								
Remarks:								

Project/Site: US 287 Lamar Bypass	(City/Co	ounty: Prowers (County	Samplin	g Date: 12/12/	12
Applicant/Owner: CDOT				State: CO		-	
Investigator(s): T. Demasters,	;						
				convex, none): conce			
Subregion (LRR): G- Western Great Plains							
				NWI clas			
Are climatic / hydrologic conditions on the site typical for							
Are Vegetation, Soil, or Hydrology				"Normal Circumstanc			No
Are Vegetation, Soil, or Hydrology				eeded, explain any ar			
SUMMARY OF FINDINGS – Attach site ma							es, etc.
Hydrophytic Vegetation Present? Yes X	No		l. (l. 0l.	1.4			
Hydric Soil Present? Yes X	No		Is the Sampled within a Wetlan		× No		
Wetland Hydrology Present? Yes X	No		within a vvetia	iiu: Tes_	140		
Remarks: *Extreme drought conditions (droughtmonitor.unl.	odu)						
Vista Del Rio Ditch north of Town of Lamar. Relic		wetla	nd swale.				
VEGETATION – Use scientific names of pla	ants.						
Tree Stratum (Plot size: 30 Ft radius)			nant Indicator	Dominance Test v			
			ies? Status	Number of Domina That Are OBL, FAC			
1 2				(excluding FAC-):	W, OI FAC	2	(A)
3				Total Number of Do	ominant		
4				Species Across All		2	_ (B)
	0			Percent of Domina	nt Species		
Sapling/Shrub Stratum (Plot size: 15 Ft radius)				That Are OBL, FAC		100	(A/B)
1				Prevalence Index	worksheet:		
2				Total % Cover	of:	Multiply by:	
3				OBL species 10			
4. 5.				FACW species	x	2 =	
0.	0	= Tota	l Cover	FAC species	x	3 =	
Herb Stratum (Plot size: 5 Ft radius				FACU species	x	4 =	_
1. Schoenoplectus pungens	70	Y	OBL	UPL species			
2. Typha angustifolia	30	Υ	OBL_	Column Totals: 10	<u>)0 </u>) 100	(B)
3				Prevalence Ir	ndex = B/A =	1.00	
4				Hydrophytic Vege			
5				X 1 - Rapid Test	for Hydrophyf	tic Vegetation	
6				X 2 - Dominance	Test is >50%	d/or OBL.	
7 8				X 3 - Prevalence	Index is ≤3.0	1	
9.				4 - Morphologi	cal Adaptation	ns ¹ (Provide su	pporting
10				Problematic H		separate sheet	•
	100	= Tota	l Cover	Problematic n	ydropnylic ve	getation (Expi	alli)
Woody Vine Stratum (Plot size: 60) 1				¹ Indicators of hydri be present, unless			must
2				Hydrophytic			
			l Cover	Vegetation Present?	Yes X	No	
% Bare Ground in Herb Stratum 0	p= =:-::						VEQ: 5-
Remarks:	D5 - FAC Neut	ral Test for	hydrology. Drop all FAC	, cross examine all other dominant	s. It > 50% remaining	are FACW to OBL, their	n YES to D5.

	•	e to the dep				or confi	rm the absence of i	ndicators.)
Depth (inches)	Matrix Color (moist)	%	Color (moist)	edox Feature %	es Type ¹	Loc ²	_ Texture	Remarks
0-16	10YR 3/2	80	7.5 YR 5/6	20	C	M,PL	Clay loam	rtomanto
					_	- <u> </u>		
-						-		
								
	-				_	-		
-								
	Concentration, D=De					ed Sand		n: PL=Pore Lining, M=Matrix.
-	Indicators: (Appli	cable to all						Problematic Hydric Soils ³ :
Histoso	` '			ly Gleyed M				(A9) (LRR I, J) rie Redox (A16) (LRR F, G, H)
	Epipedon (A2) Histic (A3)			ly Redox (S ped Matrix (ce (S7) (LRR G)
	en Sulfide (A4)			ny Mucky M	,)		s Depressions (F16)
	ed Layers (A5) (LRR	F)		ny Gleyed M				outside of MLRA 72 & 73)
	uck (A9) (LRR F, G,			eted Matrix	, ,		Reduced V	,
	ed Below Dark Surfa	ce (A11)		x Dark Sur	. ,			t Material (TF2)
	ark Surface (A12)			eted Dark S		7)		ow Dark Surface (TF12)
	Mucky Mineral (S1)			x Depressi	. ,	E40\		lain in Remarks)
	Mucky Peat or Peat ucky Peat or Peat (\$			Plains Dep				ydrophytic vegetation and drology must be present,
3 CITI WI	ucky real of real (c	33) (LKK F)	(1	WILKA 12 O	73 OI LKI	ΝП)		urbed or problematic.
Restrictive	Layer (if present):							<u></u>
	, ,							
	nches):						Hydric Soil Pre	sent? Yes ^x No
Remarks:	,							
	m soil, 0-16"							
,	·							
HYDROLO								
_	drology Indicators							
-	icators (minimum of	one required						ndicators (minimum of two required)
Surface	e Water (A1)		Salt Cru	ust (B11)			Surface	Soil Cracks (B6)
_	ater Table (A2)			Invertebrat				Vegetated Concave Surface (B8)
Saturat			Hydrog					e Patterns (B10)
	Marks (B1)			ason Water	,	•		d Rhizospheres on Living Roots (C3)
	ent Deposits (B2)		X Oxidize			ving Root		e tilled)
	eposits (B3)		,	re not tilled	•			Burrows (C8)
	lat or Crust (B4)		·	ce of Reduc	,	(4)		on Visible on Aerial Imagery (C9)
	posits (B5)	/D:	Thin Mu					phic Position (D2)
	tion Visible on Aerial		7) Other (I	Explain in R	emarks)			utral Test (D5)
	Stained Leaves (B9)						Frost-He	eave Hummocks (D7) (LRR F)
Field Obse		V	N- X - ::	(in alcos)				
			No X Depth					
Water Table			No X Depth					
Saturation F (includes ca	Present? apillary fringe)	Yes	No X Depth	(inches):		We	etland Hydrology Pr	esent? Yes <u>×</u> No
	ecorded Data (strear	m gauge, mo	onitoring well, aeri	al photos, p	revious in	spections	s), if available:	
Remarks:								

Project/Site: US 287 Lamar Bypass		City/Co	ounty:	Prowers C	County	San	npling Date: 12/1	2/12
Applicant/Owner: CDOT					State: C	O Sam	npling Point: SP-	23
Investigator(s): T. Demasters,								
							Slope (
Subregion (LRR): G- Western Great Plains								
							:	
Are climatic / hydrologic conditions on the site typical for t								
Are Vegetation, Soil, or Hydrology	•				,	•	nt? Yes x	No
Are Vegetation, Soil, or Hydrology					eded, explain a			
SUMMARY OF FINDINGS – Attach site ma								ıres, etc.
Hydrophytic Vegetation Present? Yes	No X		l = 4l=		A			
Hydric Soil Present? Yes	No x			e Sampled in a Wetlar		Yes	No X	
Wetland Hydrology Present? Yes	No <u>x</u>		*******	in a vvenai				
Remarks: *Extreme drought conditions (droughtmonitor.unl.e Vista Del Rio Ditch north of Town of Lamar. Uplar VEGETATION – Use scientific names of pla	nd paired wit	th SP-	·22.					
-	Absolute	Dom	inant	Indicator	Dominance T	est workshee	t:	
Tree Stratum (Plot size: 30 Ft radius)	% Cover	Spec	cies?	Status	Number of Do	minant Specie	s	
1					That Are OBL (excluding FA	, FACW, or FA	.С 0	(A)
2						,	-	(^)
3					Total Number Species Acros		1	(B)
4	0						·	(D)
Sapling/Shrub Stratum (Plot size: 15 Ft radius) 1						minant Specie , FACW, or FA		(A/B)
2						ndex workshe		
3.							Multiply by	
4							_ x 1 =	
5							x 2 =	
5 Et radius	0	= Tota	al Cov	ver .		95	x 3 =	
Herb Stratum (Plot size: 5 Ft radius) 1. Sporobolus cryptandrus	90	Υ		FACU	UPL species	3		
2 Kochia scoparia	5	N	-	FACU	Column Totals			(B)
3. Descurainia pinnata	3	N		UPL			- , ,	(-)
4						nce Index = B/		
5.						Vegetation In		
6					1 - Rapid	Test for Hydro All dominants are F Iance Test is >	phytic Vegetatio	n
7						ence Index is >		
8							ations ¹ (Provide	sunnorting
9					data ir	Remarks or o	n a separate she	eet)
10	00				Problema	tic Hydrophytic	c Vegetation¹ (Ex	plain)
Woody Vine Stratum (Plot size:) 1		= Tota		er er			wetland hydrolo or problematic.	gy must
2				/er	Hydrophytic Vegetation	.,	N. Y	
% Bare Ground in Herb Stratum 2					Present?		No <u>X</u>	_
Remarks:	D5 - FAC Neut	tral Test fo	or hydrolo	ogy. Drop all FAC,	cross examine all other d	ominants. If > 50% rem	naining are FACW to OBL,	then YES to D5.

SOIL

Sampling Point: SP- 23

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

Depth	Matrix				Features				
(inches)	Color (moist)	%	Co	lor (moist)		Type ¹	Loc ²	Texture	Remarks
0-16	10YR 5/3	60						silty loam	
	10YR 4/3	40							mixed matrices
			-			-			
¹ Type: C=Ce	oncentration, D=D	epletion, RM	/l=Redu	ced Matrix, CS	=Covered	or Coate	d Sand G	rains. ² Loc	cation: PL=Pore Lining, M=Matrix.
	Indicators: (App								for Problematic Hydric Soils ³ :
Histosol	(A1)			Sandy G	leyed Ma	trix (S4)		1 cm N	Muck (A9) (LRR I, J)
	oipedon (A2)				edox (S5				Prairie Redox (A16) (LRR F, G, H)
	stic (A3)				Matrix (S				Surface (S7) (LRR G)
	en Sulfide (A4)	D E)			Aucky Mir			_	Plains Depressions (F16)
	d Layers (A5) (LR l uck (A9) (LRR F, C				Gleyed Ma d Matrix (F	. ,		`	RR H outside of MLRA 72 & 73) ed Vertic (F18)
	d Below Dark Surf				ark Surfa	,			arent Material (TF2)
-	ark Surface (A12)	,				rface (F7)			shallow Dark Surface (TF12)
Sandy M	Mucky Mineral (S1))		Redox D	epression	ns (F8)		Other	(Explain in Remarks)
	Mucky Peat or Pea	. , .		_		essions (F			of hydrophytic vegetation and
5 cm Mu	icky Peat or Peat	(S3) (LRR F	;)	(MLF	RA 72 & 7	3 of LRR	H)		d hydrology must be present,
Postrictivo I	Layer (if present)							uniess	disturbed or problematic.
Type:									
Depth (in	chos):							Hydric Soil	Present? Yes No X
								Hydric 30ii	riesent: lesNo
Remarks:	oil indicators								
NO HYUHC S	oli ilidicators								
HYDROLO	GY								
Wetland Hv	drology Indicator	rs:							
_	cators (minimum o		ed: ched	k all that apply	')			Seconda	ary Indicators (minimum of two required)
Surface	-			Salt Crust (face Soil Cracks (B6)
	ater Table (A2)		-	Aquatic Inv		s (B13)			rsely Vegetated Concave Surface (B8)
Saturation			_	Hydrogen S					inage Patterns (B10)
Water M	larks (B1)			Dry-Seaso				· · · · · · · · · · · · · · · · · · ·	dized Rhizospheres on Living Roots (C3)
Sedimer	nt Deposits (B2)		_	Oxidized R	hizosphe	res on Livi	ng Roots	(C3) (w	vhere tilled)
Drift Dep	posits (B3)			(where n	ot tilled)			Cray	yfish Burrows (C8)
Algal Ma	at or Crust (B4)		_	Presence of	of Reduce	d Iron (C4	.)	Satu	uration Visible on Aerial Imagery (C9)
Iron Dep	oosits (B5)		_	Thin Muck	Surface (C7)		Geo	omorphic Position (D2)
	on Visible on Aeria	0 , (B7) _	Other (Exp	lain in Re	marks)		 -	C-Neutral Test (D5)
	tained Leaves (B9	9)						Fros	st-Heave Hummocks (D7) (LRR F)
Field Obser			v						
Surface Wat				Depth (inc					
Water Table				Depth (inc					
Saturation P		Yes	No X	Depth (inc	:hes):		_ Wetl	and Hydrolog	y Present? Yes No _x
(includes cap Describe Re	corded Data (strea	am gauge, r	nonitorin	ng well, aerial p	hotos, pro	evious ins	pections).	if available:	
	(1111)	5 5-7-		- ,	, , ,	-	//		
Remarks:									
	gic indicators								
J	,								

Project/Site: US 287 Lamar Bypass	(City/Co	ounty: Prowers	County	Samplin	ng Date: 12/12/1	2
Applicant/Owner: CDOT				State: CO	Samplin	g Point: SP- 24	
Investigator(s): T. Demasters,							
				convex, none): conve			
Subregion (LRR): G- Western Great Plains	Lat: 38.1	13331	,	Long: -102.632717		Datum: NAI	D 83
Soil Map Unit Name: Las clay loam				NWI clas			
Are climatic / hydrologic conditions on the site typical for							
Are Vegetation, Soil, or Hydrology				"Normal Circumstance			0
Are Vegetation, Soil, or Hydrology							
SUMMARY OF FINDINGS – Attach site ma							s, etc.
Hydrophytic Vegetation Present? Yes X	No		l. (l 0 l	1.4			
Hydric Soil Present? Yes X	No		Is the Sampled within a Wetlan		· No		
Wetland Hydrology Present? Yes X	No		within a wetia	nu: res_			
Remarks:							
*Extreme drought conditions (droughtmonitor.unl. Vista Del Rio Ditch northwest of Town of Lamar. VEGETATION – Use scientific names of pl	,						
20 F4 radius			nant Indicator	Dominance Test v	vorksheet:		
Tree Stratum (Plot size: 30 Ft radius			ies? Status	Number of Domina			
1				That Are OBL, FAC (excluding FAC-):	W, or FAC	1	(A)
2				Total Number of Do	minant		, ,
4				Species Across All		1	(B)
	0			Percent of Dominar	nt Species		
Sapling/Shrub Stratum (Plot size: 15 Ft radius)				That Are OBL, FAC		100	(A/B)
1				Prevalence Index	worksheet:		
2				Total % Cover		Multiply by:	
3				<u> </u>		1=	
4				FACW species 80			
5	0	= Total	l Cover	FAC species 10	x	3 = 30	
Herb Stratum (Plot size: 5 Ft radius)		1010	1 00101	FACU species	x	4 =	_
1. Muhlenbergia asperifolia	80	Υ	FACW	UPL species			_
2. Echinochloa crus-galli	10	N	FAC	Column Totals: 90	(A	() <u>190</u>	(B)
3				Prevalence In	idex = B/A =	2.11	
4				Hydrophytic Vege			
5				X 1 - Rapid Test	for Hydrophy	tic Vegetation	
6				X 2 - Dominance	Test is >50%	id/or OBL. 0	
7 8				X 3 - Prevalence	Index is ≤3.0	i ¹	
9.				4 - Morphologie	cal Adaptation	ns ¹ (Provide sup	porting
10.						separate sheet)	
	00	= Total	l Cover	Problematic Hy	/агорпунс ve	getation (Expla	111)
Woody Vine Stratum (Plot size:) 1				¹ Indicators of hydric be present, unless			nust
2				Hydrophytic			
0/ Page Crawed in 11st 20st see 10	:	= Total	l Cover	Vegetation Present?	Yes_X	No	
% Bare Ground in Herb Stratum 10 Remarks:	DE - EAC Nove	ral Toet for	hydrology Drop all EAC	, cross examine all other dominants			VES to DE
	50 - I Ao Meuli	ar roat IUI	, stology. Diop all FAC	, seed oxamine an ouier agrillidhe	2 2 00 % Terrian IIII g	S.ST. NOW WOODE, WHEN	. 20 10 00.

		to the depth r				or confir	rm the absence of in	dicators.)
Depth (inches)	Matrix	0/		x Feature		_Loc ²	- Toytura	Domonico
(inches) 0-12	Color (moist) 10 YR 4/2		Color (moist) 5 YR 5/5	_ <u> </u>	Type' C	M	Texture Silty Loam	Remarks
0-12	10 11(4/2	- 33 1.	3 11(3/3			101	Only Loan	<u> </u>
				_				
				_	-			
1Tuno: C=C	'anaantration D=Day	olotion DM=Do	duced Metrix C	C=Covere	d or Coot		Oraina 21 apation	u DI - Dava Lining M-Matrix
	Concentration, D=Deport Indicators: (Application)					ea Sana (Problematic Hydric Soils ³ :
Histoso		doic to all Like	Sandy				1 cm Muck	•
	pipedon (A2)		Sandy					e Redox (A16) (LRR F, G, H)
Black H				d Matrix (e (S7) (LRR G)
	en Sulfide (A4)			Mucky Mi				Depressions (F16)
	d Layers (A5) (LRR			Gleyed M			•	outside of MLRA 72 & 73)
	uck (A9) (LRR F, G, ed Below Dark Surfac	,	X Deplete	ed Matrix (Dark Surf			Reduced Ve	ertic (F18) Material (TF2)
	ark Surface (A12)	<i>(</i> A11)		ed Dark Si	` ')		w Dark Surface (TF12)
	Mucky Mineral (S1)			Depression		,		ain in Remarks)
	Mucky Peat or Peat		. —					drophytic vegetation and
5 cm M	ucky Peat or Peat (S	3) (LRR F)	(ML	RA 72 &	73 of LRF	R H)		rology must be present,
Restrictive	Layer (if present):						uniess distu	rbed or problematic.
	Layer (ii present).							
	nches):		_				Hydric Soil Pres	ent? Yes ^X No
Remarks:	,							
	NCV							
HYDROLO								
_	drology Indicators			I\			Casandanila	dia - t (ii
	cators (minimum of o	one requirea; ci						dicators (minimum of two required)
	Water (A1) ater Table (A2)		Salt Crust Aquatic In		se (B13)			Soil Cracks (B6) Vegetated Concave Surface (B8)
X Saturat			Aquatic iii		. ,			Patterns (B10)
	Marks (B1)		Dry-Seaso)		Rhizospheres on Living Roots (C3)
	nt Deposits (B2)		Oxidized I					
	posits (B3)			not tilled		· ·		Burrows (C8)
Algal M	at or Crust (B4)		Presence	of Reduc	ed Iron (C	4)	X Saturatio	n Visible on Aerial Imagery (C9)
Iron De	posits (B5)		Thin Mucl				X Geomorp	hic Position (D2)
	ion Visible on Aerial	Imagery (B7)	Other (Ex	plain in Re	emarks)			tral Test (D5)
	Stained Leaves (B9)						Frost-Hea	ave Hummocks (D7) (LRR F)
Field Obse		,	Υ					
			X Depth (in					
Water Table			Depth (in					10 V
Saturation F (includes ca	Present? pillary fringe)	es X No	Depth (in	iches): <u></u>		We	tland Hydrology Pre	sent? Yes <u>x</u> No
	ecorded Data (stream	n gauge, monito	oring well, aerial	photos, p	revious ins	spections), if available:	
Remarks:								
L								

Project/Site: US 287 Lamar Bypass		City/Count	y: Prowers 0	County	Sampling Date: 12/12/12
					Sampling Point: SP- 25
Investigator(s): _T. Demasters,		Section, T	ownship, Ra	inge: Section 25, Townsh	nip 22 South, Range 46 West
Landform (hillslope, terrace, etc.): terrace		Local relie	ef (concave,	convex, none): Flat	Slope (%): 1
Subregion (LRR): G- Western Great Plains					
Soil Map Unit Name: Las clay loam					ication:
Are climatic / hydrologic conditions on the site typical for thi					
Are Vegetation, Soil, or Hydrologys					
Are Vegetation, Soil, or Hydrologyı				eeded, explain any answ	
SUMMARY OF FINDINGS – Attach site map					
Hydrophytic Vegetation Present? Yes N		ls t	he Sampled	d Area	
Hydric Soil Present? Yes N Wetland Hydrology Present? Yes N		wit	hin a Wetlaı	nd? Yes	No <u>×</u>
Remarks:					
*Extreme drought conditions (droughtmonitor.unl.ed Vista Del Rio Ditch northwest of Town of Lamar. Up		ed with SF	P-24.		
VEGETATION – Use scientific names of plan	nts.				
To Otation (District 30 Ft radius	Absolute		t Indicator	Dominance Test wor	ksheet:
Tree Stratum (Plot size: 30 Ft radius	-		? Status	Number of Dominant S That Are OBL, FACW,	•
1				(excluding FAC-):	1 (A)
3				Total Number of Domi	nant
4.				Species Across All Str	0
O II (O) I O) I (D) I 15 Et radius	0	= Total Co	over	Percent of Dominant S	Species
Sapling/Shrub Stratum (Plot size: 15 Ft radius)				That Are OBL, FACW,	, or FAC: <u>50</u> (A/B
1				Prevalence Index wo	rksheet:
3.				Total % Cover of:	Multiply by:
4.					x 1 =
5					x 2 = <u>80</u>
Herb Stratum (Plot size: 5 Ft radius	0	= Total Co	over	FAC species 40	x 3 =
Herb Stratum (Plot size:	40	Υ	FACW		x 5 =
kochia scoparia	40	Υ	FACU	Column Totals: 80	
3.					
4					x = B/A = 3
5				Hydrophytic Vegetat	Hydrophytic Vegetation
6				2 - Dominance Te	
7				X 3 - Prevalence Inc	
8				4 - Morphological	Adaptations ¹ (Provide supporting
9 10					ks or on a separate sheet)
10.		= Total Co	over	Problematic Hydro	ophytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size:) 1				¹ Indicators of hydric so be present, unless dis	oil and wetland hydrology must turbed or problematic.
2.				Hydrophytic	
% Bare Ground in Herb Stratum 20		= Total Co		Vegetation Present? You	es No _X
Remarks:	D5 - FAC Neu	tral Test for hydro	ology. Drop all FAC,	, cross examine all other dominants. If >	> 50% remaining are FACW to OBL, then YES to D5
hydric soil and wetland vegetation are not present.					
1					

SOIL

Sampling Point: SP- 25

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

Depth	Matrix		Redox Features	1 0		
(inches)	Color (moist)	%(Color (moist) % Type	e ¹ Loc ²	Texture	Remarks
0-12	10 YR 5/3	100				
						-
				· · · · · · · · · · · · · · · · · · ·		
		 				
						_
¹ Type: C=C	oncentration. D=De	oletion. RM=Red	uced Matrix, CS=Covered or Co	ated Sand Gra	ains. ² Location:	PL=Pore Lining, M=Matrix.
			s, unless otherwise noted.)			oblematic Hydric Soils ³ :
Histoso			Sandy Gleyed Matrix (Se	4)	1 cm Muck (A	•
				+)		
	pipedon (A2)		Sandy Redox (S5)			Redox (A16) (LRR F, G, H)
	istic (A3)		Stripped Matrix (S6)	-4)		(S7) (LRR G)
	en Sulfide (A4)	-\	Loamy Mucky Mineral (F	,		epressions (F16)
	d Layers (A5) (LRR		Loamy Gleyed Matrix (F	2)	,	utside of MLRA 72 & 73)
	uck (A9) (LRR F, G ,	,	Depleted Matrix (F3)		Reduced Vert	` '
	d Below Dark Surfac	ce (A11)	Redox Dark Surface (F6		Red Parent M	
	ark Surface (A12)		Depleted Dark Surface (,		Dark Surface (TF12)
	Mucky Mineral (S1)		Redox Depressions (F8)		Other (Explain	
	Mucky Peat or Peat				•	ophytic vegetation and
5 cm Mi	ucky Peat or Peat (S	33) (LRR F)	(MLRA 72 & 73 of L	RR H)		logy must be present,
					unless disturb	ped or problematic.
Restrictive	Layer (if present):					
Type:						
Depth (in	ches):				Hydric Soil Presei	nt? Yes No ×
Remarks:						
Remarks.						
HYDROLO	GY					
Wetland Hy	drology Indicators	:				
_	cators (minimum of		ack all that apply)		Secondary India	cators (minimum of two required)
	•	one required, en			-	• • • • • • • • • • • • • • • • • • • •
	Water (A1)		Salt Crust (B11)			il Cracks (B6)
High Wa	ater Table (A2)		Aquatic Invertebrates (B13			egetated Concave Surface (B8)
Saturati	on (A3)		Hydrogen Sulfide Odor (C1	1)	Drainage P	Patterns (B10)
Water N	/larks (B1)		Dry-Season Water Table (C2)	Oxidized R	hizospheres on Living Roots (C3)
Sedime	nt Deposits (B2)		Oxidized Rhizospheres on	Living Roots (C3) (where ti	illed)
	posits (B3)		(where not tilled)		Crayfish Bu	urrows (C8)
	at or Crust (B4)		Presence of Reduced Iron	(C4)		Visible on Aerial Imagery (C9)
_	posits (B5)		Thin Muck Surface (C7)	(04)		, ,
	, ,	Image: (DZ)		`		ic Position (D2)
' 	ion Visible on Aerial	ımagery (B7)	Other (Explain in Remarks)		al Test (D5)
	Stained Leaves (B9)				Frost-Heav	re Hummocks (D7) (LRR F)
Field Obser	vations:					
Surface Wat	ter Present? `	res No 🤇	Depth (inches):			
Water Table	Present?	res No	Depth (inches):			
Saturation F			Depth (inches):		and Hydrology Prose	ent? Yes No ^x
	pillary fringe)	103100_2	Deptil (iliciles)		ina riyarology Frest	163 110
		n gauge, monito	ring well, aerial photos, previous	inspections), i	f available:	
	(<i>y y</i> ,	_ , , , , , , , , , , , , , , , , , , ,	,,		
D						
Remarks:						
No hydrolog	gy					
			· · · · · · · · · · · · · · · · · · ·			

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: US 287 Lamar Bypass		City/C	ounty:	Prowers C	County	Sam	pling Date: 12/	12/12
Applicant/Owner: CDOT	_				State: C		-	
Investigator(s): T. Demasters,								
					convex, none): 1			
Subregion (LRR): G- Western Great Plains								
Soil Map Unit Name: Lincoln sand					NW			
Are climatic / hydrologic conditions on the site typical for								
Are Vegetation, Soil, or Hydrology					Normal Circums			No
Are Vegetation, Soil, or Hydrology					eded, explain a			
SUMMARY OF FINDINGS – Attach site ma								ures, etc.
Hydrophytic Vegetation Present? Yes	No X		le th	e Sampled	Aroa			
Hydric Soil Present? Yes				in a Wetlar		res	No. X	
Wetland Hydrology Present? Yes	No <u>x</u>		******	a rrotiai				
*Extreme drought conditions (droughtmonitor.unl.e. Pond to east of Speculator Ave. and west of US 5 VEGETATION – Use scientific names of pla	0. Úpland pa	air for	· SP-2	27				
20 Ft radius	Absolute				Dominance T	est workshee	t:	
Tree Stratum (Plot size: 30 Ft radius)	% Cover				Number of Do			
1					That Are OBL (excluding FA		0	(A)
2					Total Number	of Dominant		
4					Species Acros		0	(B)
	0				Percent of Do	minant Specie	2	
Sapling/Shrub Stratum (Plot size: 15 Ft radius)					That Are OBL			(A/B)
1					Prevalence In	idex workshe	et:	
2					Total % C	over of:	Multiply b	y:
3					OBL species		x 1 =	
5					FACW species	s	x 2 =	
	0	= Tota	al Cov	er			x 3 =	
Herb Stratum (Plot size: 5 Ft radius					FACU species			
1. Kochia scoparia	25	Y		FACU	UPL species	35	x 5 = 175	
2. Descurainia pinnata	15	N		UPL	Column Totals	s: <u>60</u>	(A) <u>275</u>	(B)
3. Bromus tectorum		Υ		UPL	Prevaler	nce Index = B/	A = 4.58	
4					Hydrophytic '	Vegetation Inc	dicators:	
5 6					1 - Rapid	Test for Hydro	phytic Vegetatio	on
7						ance Test is >		
8.					3 - Preval			
9.							ations ¹ (Provide n a separate sh	
10							: Vegetation¹ (E	•
	60	= Tota	al Cov	er				
Woody Vine Stratum (Plot size:) 1							wetland hydrolo or problematic.	
2					Hydrophytic			
9/ Poro Cround in black Stratum 40		= Tota	al Cov	er	Vegetation Present?	Yes	No X	
% Bare Ground in Herb Stratum 40 Remarks:	D5 - FAC Nout	tral Test fr	or hvdrolo	ιαν. Drop all FΔC	cross examine all other d			then YES to D5
		. 200	, 2.070	o,	3.00010	307710111	J	

SOIL

Sampling Point: SP- 26

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

(inches)	Color (moist)	% C	olor (moist) % Type ¹	Loc ²	Texture	Remarks
0-12	10 YR 5/4	100			Silt Loam	
						_
	-					
	· · · · · · · · · · · · · · · · · · ·					-
			uced Matrix, CS=Covered or Coate	d Sand Gra		n: PL=Pore Lining, M=Matrix.
-	`	able to all LRRs	s, unless otherwise noted.)		Indicators for	Problematic Hydric Soils ³ :
Histosol	(A1)		Sandy Gleyed Matrix (S4)		1 cm Muck	(A9) (LRR I, J)
	pipedon (A2)		Sandy Redox (S5)			rie Redox (A16) (LRR F, G, H)
Black Hi	istic (A3)		Stripped Matrix (S6)			ce (S7) (LRR G)
	en Sulfide (A4)		Loamy Mucky Mineral (F1)		High Plains	s Depressions (F16)
Stratified	d Layers (A5) (LRR F	;)	Loamy Gleyed Matrix (F2)		(LRR H	outside of MLRA 72 & 73)
1 cm Mu	uck (A9) (LRR F, G, F	1)	Depleted Matrix (F3)		Reduced V	/ertic (F18)
Depleted	d Below Dark Surface	e (A11)	Redox Dark Surface (F6)		Red Paren	t Material (TF2)
Thick Da	ark Surface (A12)		Depleted Dark Surface (F7)		Very Shallo	ow Dark Surface (TF12)
Sandy M	Mucky Mineral (S1)		Redox Depressions (F8)		Other (Exp	olain in Remarks)
2.5 cm N	Mucky Peat or Peat (S2) (LRR G, H)	High Plains Depressions (F	16)	³ Indicators of h	ydrophytic vegetation and
5 cm Mu	ucky Peat or Peat (S3	3) (LRR F)	(MLRA 72 & 73 of LRR	H)	wetland hy	drology must be present,
					unless dist	urbed or problematic.
Restrictive I	Layer (if present):					
Type:						
Depth (in	ches):				Hydric Soil Pre	sent? Yes No ^X
Remarks:	,					
rtomarko.						
HYDROLO	GY					
	• .					
wettand ny	dualani ludiaataua.					
	drology Indicators:					
-	cators (minimum of o	ne required; che	eck all that apply)			ndicators (minimum of two required)
-		ne required; che	eck all that apply) Salt Crust (B11)			ndicators (minimum of two required) Soil Cracks (B6)
Surface	cators (minimum of o	ne required; che			Surface	
Surface	cators (minimum of or Water (A1) ater Table (A2)	ne required; che	Salt Crust (B11)		Surface Sparsely	Soil Cracks (B6)
Surface High Wa	cators (minimum of or Water (A1) ater Table (A2)	ne required; che	Salt Crust (B11) Aquatic Invertebrates (B13)		Surface Sparsely Drainage	Soil Cracks (B6) y Vegetated Concave Surface (B8)
Surface High Wa Saturatio Water M	cators (minimum of or Water (A1) ater Table (A2) on (A3) farks (B1)	ne required; che	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)	ina Roots (Surface Sparsely Drainage Oxidized	Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3)
Surface High Wa Saturatic Water M	cators (minimum of or Water (A1) ater Table (A2) on (A3) farks (B1) nt Deposits (B2)	ne required; che	 Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living 	ing Roots (Surface Sparsely Drainage Oxidized	Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) e tilled)
Surface High Wa Saturatio Water M Sedimer Drift Dep	cators (minimum of or Water (A1) ater Table (A2) on (A3) flarks (B1) nt Deposits (B2) posits (B3)	ne required; che	 Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Livit (where not tilled) 		Surface Sparsely Drainage Oxidized (C3) Crayfish	Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) e tilled) Burrows (C8)
Surface High Wa Saturatio Water M Sedimer Drift Dep Algal Ma	cators (minimum of or Water (A1) ater Table (A2) on (A3) flarks (B1) nt Deposits (B2) posits (B3) at or Crust (B4)	ne required; che	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Livi (where not tilled) Presence of Reduced Iron (C4)		Surface Sparsely Drainage Oxidized (C3) (where Crayfish Saturatio	Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) e tilled) Burrows (C8) on Visible on Aerial Imagery (C9)
Surface High Wa Saturatio Water M Sedimer Drift Dep Algal Ma	cators (minimum of or Water (A1) ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5)		Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Livi (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)		Surface Sparsely Drainage Oxidized (C3) (where Crayfish Saturatie Geomor	Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) e tilled) Burrows (C8) on Visible on Aerial Imagery (C9) phic Position (D2)
Surface High Wa Saturatio Water M Sedimer Drift Dep Algal Ma Iron Dep	cators (minimum of or Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aerial II		Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Livi (where not tilled) Presence of Reduced Iron (C4)		Surface Sparsely Drainage Oxidized (C3) (where Crayfish Saturation Geomor FAC-Ne	Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) e tilled) B Burrows (C8) on Visible on Aerial Imagery (C9) phic Position (D2) utral Test (D5)
Surface High Wa Saturatio Water M Sedimer Drift Dep Algal Ma Iron Dep Inundati Water-S	cators (minimum of or Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aerial Instained Leaves (B9)		Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Livi (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)		Surface Sparsely Drainage Oxidized (C3) (where Crayfish Saturation Geomor FAC-Ne	Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) e tilled) Burrows (C8) on Visible on Aerial Imagery (C9) phic Position (D2)
Surface High Wa Saturatio Water M Sedimer Drift Dep Algal Ma Iron Dep	cators (minimum of or Water (A1) ater Table (A2) on (A3) flarks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aerial In Stained Leaves (B9)	magery (B7)	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Livi (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	*)	Surface Sparsely Drainage Oxidized (C3) (where Crayfish Saturation Geomor FAC-Ne	Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) e tilled) B Burrows (C8) on Visible on Aerial Imagery (C9) phic Position (D2) utral Test (D5)
Surface High Wa Saturatio Water M Sedimer Drift Dep Algal Ma Iron Dep Inundati Water-S	cators (minimum of or Water (A1) ater Table (A2) on (A3) flarks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aerial In Stained Leaves (B9)	magery (B7)	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Livi (where not tilled) Presence of Reduced Iron (C4) Thin Muck Surface (C7)	*)	Surface Sparsely Drainage Oxidized (C3) (where Crayfish Saturation Geomor FAC-Ne	Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) e tilled) B Burrows (C8) on Visible on Aerial Imagery (C9) phic Position (D2) utral Test (D5)
Surface High Wa Saturatio Water M Sedimer Drift Dep Algal Ma Iron Dep Inundati Water-S	cators (minimum of or Water (A1) ater Table (A2) on (A3) Marks (B1) int Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aerial Instained Leaves (B9) vations:	magery (B7) es No <u>X</u>	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Livi (where not tilled) Presence of Reduced Iron (C4 Thin Muck Surface (C7) Other (Explain in Remarks)	_	Surface Sparsely Drainage Oxidized (C3) (where Crayfish Saturation Geomor FAC-Ne	Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) e tilled) B Burrows (C8) on Visible on Aerial Imagery (C9) phic Position (D2) utral Test (D5)
Surface High Wa Saturatio Water M Sedimer Drift Dep Algal Ma Iron Dep Inundati Water-S Field Obser Surface Water	cators (minimum of or Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aerial Installed Leaves (B9) reations: er Present? Ye	magery (B7) es No <u>X</u> es No <u>X</u>	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Livi (where not tilled) Presence of Reduced Iron (C4 Thin Muck Surface (C7) Other (Explain in Remarks) Depth (inches): Depth (inches):	-	Surface Sparsely Drainage Oxidized C3) (where Crayfish Saturation Geomor FAC-Ne Frost-He	Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) e tilled) B Burrows (C8) on Visible on Aerial Imagery (C9) phic Position (D2) utral Test (D5) eave Hummocks (D7) (LRR F)
Surface High Wa Saturatio Water M Sedimer Drift Dep Algal Ma Iron Dep Inundati Water-S Field Obser Surface Water Water Table Saturation P (includes cap	cators (minimum of or Water (A1) ater Table (A2) on (A3) flarks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aerial Instance Leaves (B9) evations: are Present? Present? fresent? fresent? fresent? fresent? fresent? fresent?	magery (B7) es No _X es No _X es No _X	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Livi (where not tilled) Presence of Reduced Iron (C4 Thin Muck Surface (C7) Other (Explain in Remarks) Depth (inches): Depth (inches):	Wetla	Surface Sparsely Drainage Oxidized C3) (where Crayfish Saturatio Geomor FAC-Ne Frost-He	Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) e tilled) B Burrows (C8) on Visible on Aerial Imagery (C9) phic Position (D2) utral Test (D5)
Surface High Wa Saturatio Water M Sedimer Drift Dep Algal Ma Iron Dep Inundati Water-S Field Obser Surface Water Water Table Saturation P (includes cap	cators (minimum of or Water (A1) ater Table (A2) on (A3) flarks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aerial Instance Leaves (B9) evations: are Present? Present? fresent? fresent? fresent? fresent? fresent? fresent?	magery (B7) es No _X es No _X es No _X	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Livi (where not tilled) Presence of Reduced Iron (C4 Thin Muck Surface (C7) Other (Explain in Remarks) Depth (inches): Depth (inches):	Wetla	Surface Sparsely Drainage Oxidized C3) (where Crayfish Saturatio Geomor FAC-Ne Frost-He	Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) e tilled) B Burrows (C8) on Visible on Aerial Imagery (C9) phic Position (D2) utral Test (D5) eave Hummocks (D7) (LRR F)
Surface High Wa Saturatio Water M Sedimer Drift Dep Algal Ma Iron Dep Inundati Water-S Field Obser Surface Water Water Table Saturation P (includes cap	cators (minimum of or Water (A1) ater Table (A2) on (A3) flarks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aerial Instance Leaves (B9) evations: are Present? Present? fresent? fresent? fresent? fresent? fresent? fresent?	magery (B7) es No _X es No _X es No _X	Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Oxidized Rhizospheres on Livi (where not tilled) Presence of Reduced Iron (C4 Thin Muck Surface (C7) Other (Explain in Remarks) Depth (inches): Depth (inches):	Wetla	Surface Sparsely Drainage Oxidized C3) (where Crayfish Saturatio Geomor FAC-Ne Frost-He	Soil Cracks (B6) y Vegetated Concave Surface (B8) e Patterns (B10) d Rhizospheres on Living Roots (C3) e tilled) B Burrows (C8) on Visible on Aerial Imagery (C9) phic Position (D2) utral Test (D5) eave Hummocks (D7) (LRR F)
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WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: US 287 Lamar Bypass			City/Co	ounty:	Prowers C	County	Sampling Date: 12/12/12
Applicant/Owner: CDOT						State: CO	
Investigator(s): T. Demasters,							22 South, Range 46 West
Landform (hillslope, terrace, etc.): terr							Slope (%): 1
Subregion (LRR): G- Western Great P							
Soil Map Unit Name: Lincoln sand						NWI classifica	
Are climatic / hydrologic conditions on							
Are Vegetation, Soil, o							resent? Yes X No
Are Vegetation, Soil, o						eded, explain any answer	
SUMMARY OF FINDINGS – A							
Hydrophytic Vegetation Present?	Yes X	No				_	
Hydric Soil Present?	Yes x				Sampled		No
Wetland Hydrology Present?	Yes x			withi	n a Wetlar	id? Yes <u>^</u>	No
Remarks:							
*Extreme drought conditions (dro Pond north of Town of Lamar. Po VEGETATION – Use scientifi	and to east of Spe	eculator Ave.	and w	west o	of US 50.	PEM wetland fringe or	ı pond.
20 Ft radiu		Absolute			Indicator	Dominance Test works	sheet:
Tree Stratum (Plot size: 30 Ft radiu		% Cover				Number of Dominant Sp	
1						That Are OBL, FACW, c (excluding FAC-):	or FAC (A)
2						,	
3 4						Total Number of Domina Species Across All Strat	0
		0			er	Percent of Dominant Sp	
Sapling/Shrub Stratum (Plot size: 1	5 Ft radius					That Are OBL, FACW, o	
1						Prevalence Index work	reheat:
2							Multiply by:
3							x 1 = 100
4							x 2 =
5							x 3 =
Herb Stratum (Plot size: 5 Ft radius)	0	= Tota	ii Cove	er	FACU species	
1. Schoenoplectus acutus		60	Υ		OBL		x 5 =
2. Typha angustifolia		40	Υ		OBL	Column Totals: 100	(A) <u>100</u> (B)
3						Prevalence Index	$= R/\Delta = 1$
4						Hydrophytic Vegetatio	
5						X 1 - Rapid Test for H	vdrophytic Vegetation
6						X 2 - Dominance Test	its are FACW and/or OBL.
7						X 3 - Prevalence Inde	
8							daptations ¹ (Provide supporting
9 10							or on a separate sheet)
10.		400	= Total		er	Problematic Hydrop	hytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size:						¹ Indicators of hydric soil be present, unless distu	and wetland hydrology must rbed or problematic.
2.						Hydrophytic	
			= Total	l Cove	er	Vegetation Present? Yes	s ^X No
% Bare Ground in Herb Stratum 0 Remarks:		p= =:-::					
Inciliains.		υ5 - FAC Neut	ıraı i est for	r nyarolog	ју. ⊔гор а∥ ⊦АС,	cross examine all other dominants. If > 50	% remaining are FACW to OBL, then YES to D5.

SOIL Sampling Point: SP- 27

Depth	<u>Matrix</u>	0/		x Feature		. 2	- .	
(inches) 0-16	Color (moist) 10 YR 5/1	<u>%</u> 90	Color (moist)	%	Type ¹	Loc ²	Texture silt loam	Remarks
J-16	10 1K 5/1	_ 90	7.5 YR 5/6	8			Siit ioam	
			10 YR 2/1	_ 2				
				_				
		_		-				
		_		_				
• •	Concentration, D=De					d Sand G		ion: PL=Pore Lining, M=Matrix.
lydric Soil	Indicators: (Applie	cable to all	LRRs, unless othe	rwise no	ted.)		Indicators fo	r Problematic Hydric Soils³:
Histoso				Gleyed M				ck (A9) (LRR I, J)
	pipedon (A2)			Redox (S	•			airie Redox (A16) (LRR F, G, H)
	listic (A3)			d Matrix (face (S7) (LRR G)
	en Sulfide (A4) ed Layers (A5) (LRR	E\		Mucky Mi Gleyed M	neral (F1)		_	ns Depressions (F16) H outside of MLRA 72 & 73)
	uck (A9) (LRR F, G ,			ed Matrix (. ,		,	Vertic (F18)
	ed Below Dark Surface	,		Dark Surf	. ,			ent Material (TF2)
	ark Surface (A12)	()			urface (F7)			llow Dark Surface (TF12)
	Mucky Mineral (S1)		Redox	Depression	ns (F8)			rplain in Remarks)
2.5 cm	Mucky Peat or Peat	(S2) (LRR 0	5, H) High Pl	ains Depr	essions (F	16)	³ Indicators of	hydrophytic vegetation and
5 cm M	ucky Peat or Peat (S	33) (LRR F)	(ML	RA 72 &	73 of LRR	H)		ydrology must be present,
							unless di	sturbed or problematic.
Restrictive	Layer (if present):							
Type:								
	nches):						Hydric Soil Pr	resent? Yes <u>×</u> No
							Hydric Soil Pr	resent? Yes × No
Depth (ir							Hydric Soil Pr	resent? Yes <u>×</u> No
Depth (ir							Hydric Soil Pr	resent? Yes <u>×</u> No
Depth (ir Remarks:	nches):						Hydric Soil Pr	resent? Yes <u>×</u> No
Depth (ir	OGY						Hydric Soil Pr	resent? Yes <u>×</u> No
Depth (ir Remarks: YDROLO	OGY vdrology Indicators	:		lv)				
Depth (ir Remarks: YDROLC Vetland Hy Primary Indi	OGY vdrology Indicators	:	l; check all that app				Secondary	Indicators (minimum of two required
Depth (ir Remarks: YDROLO Vetland Hy Primary Indi	OGY rdrology Indicators icators (minimum of a Water (A1)	:	l; check all that app Salt Crust	(B11)	as (R13)		Secondary Surfac	Indicators (minimum of two required e Soil Cracks (B6)
Depth (ir Remarks: YDROLO Vetland Hy Primary Indi Surface High W	OGY vdrology Indicators icators (minimum of Water (A1) ater Table (A2)	:	l; check all that app Salt Crust Aquatic In	: (B11) ivertebrate	. ,		Secondary Surfac Sparse	Indicators (minimum of two required e Soil Cracks (B6)
Depth (in Permarks: YDROLC Yetland Hy Primary Indi Surface High W Saturati	OGY vdrology Indicators icators (minimum of a Water (A1) ater Table (A2) ion (A3)	:	l; check all that app Salt Crust Aquatic In Hydrogen	(B11) vertebrate Sulfide C	dor (C1)		Secondary Surfac Sparse Draina	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10)
Depth (in Depth	orches):	:	l; check all that app Salt Crust Aquatic In Hydrogen Dry-Seaso	(B11) overtebrate Sulfide C on Water	dor (C1) Table (C2)	ing Roots	Secondary Surfac Sparse Draina Oxidize	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3
Depth (ir Remarks: YDROLO Vetland Hy Primary Indi Surface High W Saturati Water M Sedime	OGY Idrology Indicators icators (minimum of extense (A1) ater Table (A2) ion (A3) Marks (B1) ent Deposits (B2)	:	l; check all that app Salt Crust Aquatic In Hydrogen X Dry-Sease Oxidized	(B11) Ivertebrate Sulfide C on Water Rhizosphe	dor (C1) Table (C2) eres on Liv	ing Roots	Secondary Surfac Sparse Draina Oxidize (C3) (whe	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (C3 ere tilled)
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Depth (in Remarks: YDROLO Vetland Hy Primary Indi Surface High W Saturati Water M Sedime Drift De Inundat Water-S Gurface Water-S Gurface Water Table Saturation Fincludes ca	orches): orches	: one required Yes I Yes I Yes I	d; check all that app Salt Crust Aquatic In Hydrogen X Dry-Sease Oxidized I (where Presence Thin Mucl 7) Other (Ex	ivertebrate Sulfide Con Water Rhizosphe not tilled of Reduce Surface plain in Reduces): 4	dor (C1) Table (C2) eres on Liv) ed Iron (C4 (C7) emarks)		Secondary Surfac Sparse Draina Oxidize (C3) (whe Crayfis X Satura X Geome X FAC-N Frost-H	Indicators (minimum of two required e Soil Cracks (B6) ely Vegetated Concave Surface (B8) ge Patterns (B10) ed Rhizospheres on Living Roots (Care tilled) eh Burrows (C8) tion Visible on Aerial Imagery (C9) preprice Position (D2) leutral Test (D5) Heave Hummocks (D7) (LRR F)

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: US 287 Lamar Bypass		City/County	Prowers 0	County	Sampling Date: 12/12/12
				State: CO	
Investigator(s): T. Demasters,		Section, To	wnship, Ra	nge: Section 33, Townshi	p 22 South, Range 46 West
				-	Slope (%): 8
Subregion (LRR): G- Western Great Plains					
Soil Map Unit Name: Las clay loam; Las clay loam, saline;Roc					
Are climatic / hydrologic conditions on the site typical for this	s time of yea	ar? Yes	No ^X	(If no, explain in R	demarks.)
Are Vegetation, Soil, or Hydrologys					
Are Vegetation, Soil, or Hydrology r					
SUMMARY OF FINDINGS – Attach site map	showing	samplin	g point l	ocations, transects	, important features, etc.
Hydrophytic Vegetation Present? Yes X N	0	ls th	e Sampled	l Area	
Hydric Soil Present? Yes x N			in a Wetlar		No
Wetland Hydrology Present? Yes X N Remarks:	0				
*Extreme drought conditions (droughtmonitor.unl.ed PSS fringe on Willow Creek.	u)				
VEGETATION – Use scientific names of plan	to				
VEGETATION – Use scientific flames of plan	Absolute	Dominant	Indicator	Dominance Test work	sheet:
Tree Stratum (Plot size: 30 Ft radius)		Species?		Number of Dominant S	
1				That Are OBL, FACW,	
2				(excluding FAC-):	<u>2</u> (A)
3				Total Number of Domin Species Across All Stra	0
4		- Total Ca			
Sapling/Shrub Stratum (Plot size: 15 Ft radius)		= Total Cov	rei	Percent of Dominant Sp That Are OBL, FACW,	
1. Salix exigua	45	<u>Y</u>	FACW		
2				Prevalence Index wor	Ksneet: Multiply by:
3					x 1 =
4					x 2 = 140
5					x 3 =
Herb Stratum (Plot size: 5 Ft radius	45	= Total Cov	er	FACU species	
1. Muhlenbergia asperifolia	15	Υ	FACW		x 5 =
2. Rumex Crispus	10	N	FACW	Column Totals: 70	(A) <u>140</u> (B)
3				Prevalence Index	- R/Δ - 2.00
4				Hydrophytic Vegetation	
5				X 1 - Rapid Test for I	Hydrophytic Vegetation
6				X 2 - Dominance Tes	nants are FACW and/or OBL. St is >50%
7				X 3 - Prevalence Inde	ex is ≤3.0 ¹
8				4 - Morphological A	Adaptations ¹ (Provide supporting
10					s or on a separate sheet) phytic Vegetation ¹ (Explain)
		= Total Cov	ver		
Woody Vine Stratum (Plot size:) 1	_			¹ Indicators of hydric soi be present, unless disti	il and wetland hydrology must urbed or problematic.
2.				Hydrophytic	
% Bare Ground in Herb Stratum 30		= Total Cov		Vegetation Present? Ye	s <u> </u>
Remarks:	D5 - FAC Neut	ral Test for hydrolo	ogy. Drop all FAC,	cross examine all other dominants. If > !	50% remaining are FACW to OBL, then YES to D5.
PSS wetland.					

SOIL Sampling Point: SP- 28

						or confir	n the absence of ir	ndicators.)
Depth	Matri			dox Feature	4	1 2	T (Dameda
(inches)	Color (moist)		Color (moist)		Type'	Loc ²	Texture	Remarks
0-16	10YR 4/1	80	10YR 5/8	20	<u>C</u>	M	sandy loam	
								_
-							· 	
	<u> </u>							
-					-	-		
-							· 	
			=Reduced Matrix,			ed Sand G		n: PL=Pore Lining, M=Matrix.
Hydric Soil	Indicators: (App	olicable to al	LRRs, unless oth	nerwise no	ted.)		Indicators for I	Problematic Hydric Soils ³ :
Histoso	l (A1)		Sand	y Gleyed M	atrix (S4)		1 cm Muck	(A9) (LRR I, J)
Histic E	pipedon (A2)		Sand	y Redox (S	5)		Coast Prair	ie Redox (A16) (LRR F, G, H)
Black H	listic (A3)			ed Matrix (,		Dark Surface	ce (S7) (LRR G)
Hydroge	en Sulfide (A4)		Loam	y Mucky Mi	ineral (F1)		High Plains	Depressions (F16)
	d Layers (A5) (LR			y Gleyed M			,	outside of MLRA 72 & 73)
	uck (A9) (LRR F,			eted Matrix	` '		Reduced V	` '
	ed Below Dark Sur			x Dark Surf				: Material (TF2)
	ark Surface (A12)			eted Dark S)		w Dark Surface (TF12)
	Mucky Mineral (S1	,		x Depression		(4.0)		ain in Remarks) /drophytic vegetation and
	Mucky Peat or Pe ucky Peat or Peat			Plains Depr /ILRA 72 &				
5 CIII W	ucky real of real	(33) (LKK F	(N	ILKA 12 &	73 OI LKF	(П)		Irology must be present, urbed or problematic.
Postrictivo	Layer (if present	١٠					uniess disti	dibed of problematic.
_		•						
Type:	I \						11 - 1-1 - 0 - 11 P	
	nches):						Hydric Soil Pres	sent? Yes X No No
Remarks:								
HYDROLC	OGY							
	drology Indicato	re:						
_			d; check all that ap	volv.)			Secondary In	dicators (minimum of two required)
	•	one require	•	• • • • • • • • • • • • • • • • • • • •			-	
	e Water (A1)		Salt Cru		(D40)			Soil Cracks (B6)
_	ater Table (A2)		Aquatic		, ,			Vegetated Concave Surface (B8)
X Saturati			Hydroge				_	e Patterns (B10)
' 	Marks (B1)			son Water	, ,			Rhizospheres on Living Roots (C3)
	ent Deposits (B2)		·	d Rhizosphe		ring Roots	. ,	e tilled)
X Drift De	. , ,		,	e not tilled	,			Burrows (C8)
	at or Crust (B4)			e of Reduc		4)		on Visible on Aerial Imagery (C9)
Iron De	posits (B5)			ck Surface			X Geomor	phic Position (D2)
Inundat	ion Visible on Aer	ial Imagery (E	37) Other (E	Explain in R	emarks)		X FAC-Nei	utral Test (D5)
Water-S	Stained Leaves (B	9)					Frost-He	ave Hummocks (D7) (LRR F)
Field Obser	rvations:							
Surface Wa	ter Present?	Yes	No X Depth ((inches):				
Water Table	Present?		No X Depth (
Saturation F			No Depth (land Hydrology Pre	esent? Yes <u>×</u> No
	pillary fringe)	103	Depart	(11101103)		_ ""	iana myarology i n	16310
		am gauge, m	onitoring well, aeria	al photos, p	revious ins	spections)	, if available:	
Remarks:								

APPENDIX C FACWet Data Forms

ADMINISTRATIVE CHARACTERIZATION

						,					
General Info	ormat	ion				Date of Evaluation:	12/14/201	12			
Site Name or ID		Wetland 1 (Vis Ditch)	ta Del Rio			Project Name:	US 287 L	amar Bypass	5		
404 or Other Pe	ermit				Αį	oplicant Name:	CDOT				
Evaluator Name		Elly Weber			Evaluator's profes	sional position and organization:	Biologist,	Pinyon Envi	ronmental		
Location Inf	forma	tion:									
Site Location (Lat./Long. or UTM)):	38.113331°, -1	02.632717°			Datum Used (NAD 83	NAD 83				
USGS Quadrar Map:	ngle	Lamar East				Map Scale: (Circle one)	(1:24,000 Other)1:100,000 1:		
Sub basin Nam digit HUC):	ne (8	11020009				Wetland Ownership:	Private				
Project Info	rmati	on:			х	Potentially Imp	pacted We	etlands			
This evaluation being performe	is d at:	x Project We Mitigation S			Purpose of Evaluation (check all applicable):	Mitigation; Pro Mitigation; Poo Monitoring Other (Describ	e-construc st-constru	tion			
Intent of Projec	t: (Chec	k all applicable)	Ī		Restortation	☐ En	hancement		Creation		
Total Size of W (Record Area, Cheo Measurement Meth	ck and D	escribe	ac.	Х	Measured 0.010 Estimated	6					
Assessment Ar Area, check appropria					Measured	0.016	ac.	ac.	ac.		
used to record acreag included in a single as	ge when m	ore than one AA is	ac.		Estimated	ac.	ac.	ac.	ac.		
Characteristics AA boundary de			This AA is V Rio Ditch.	۷L	-1 and WL-5, wid	ch are a series	of fringe v	vetlands alon	g Vista Del		
Notes:	AA is a	man-made dit	ch.								

ECOLOGICAL DESCRIPTION 1

Special Cor	ncerns	Check all that apply						
	s including Histosols or He AA (i.e., AA includes o				-	ened or end o occur in th	-	species are
	lirectly impact organic so eas possessing either Hi							
	s are known to occur any vetland of which the AA							Colorado Natural r in the AA?
The wetland urbanized la	is a habitat oasis in an ondscape?	otherwise dry or	Х		ment occu		•	conservation area s determined by
	eatened or endangered AA? List Below.	species are KNOWN to		Other	special co	oncerns (ple	ease desc	cribe)
	H	IYDROGEOMOR	PHI	C SE	TTINC	}		
AA wetland If the above	has been subject to che is checked, please de	ntal natural hydrogeomo nange in HGM classes a scribe the original wetla	s a re	sult of	anthropo	-		ow.
x AA wetland	was created from an u	pland setting.						
Current Cor	nditions	Describe the hydrogeor that apply.	morph	ic sett	ing of the	wetland by	/ circling	all conditions
	Water source	Surface flow	(round	lwater	Precipita	ation	Unknown
	Hydrodynamics	Unidirectional		Verti	ical	Bi-direct	ional	
	Wetland Gradient	0 - 29	%	2-4	4%	4-10%	>10	%
	# Surface Inlets	Over-bank		0 (1	2	3	>3
UCM Sotting	# Surface Outlets		()	(1)	2	3	>3
HGM Setting	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	This wetland is a series	of frin	nge we	etlands al	ong Willow	Creek.	
	HGM class	Riverine		Slo	ре	Depress	ional	Lacustrine
Historical Co	nditions							
	Water source	Surface flow	C	round	lwater	Precipita	ation	Unknown
	Hydrodynamics	Unidirectional		Verti	ical			
Previous wetland typology	Geomorphic Setting (Narrative Description)							
	Previous HGM Class	Riverine		Slo	ре	Depress	ional	Lacustrine
		HGM subclass and regio prically upland setting.	nal su	bclass	s): This is	a man-ma	de canal	, therefore the

ECOLOGICAL DESCRIPTION 2

Veç	jeta	tion				scri	iptic	on					classii									l. (197		
S	yster	n	Sul	bsyst	em		Clas	S		Sı	ubcla	SS			Wate	er Re	gime)	Oth	ner M	1odifi	ers	% /	A٨
Ri	iverin	ne	ne Palustrine		ine		UB		R	Roote	ed va	scula	ar			Е							10	00
acust Palust	rine			trine peren		Uncor Aqua Rock Unco Em Shru	ck Bot. n Botto atic Be sy Shor on Shor ergent ab-scru	om(UB) d(AB) re(RS) re(US) (EM) b(SS)		Roote Algal Non- oad-lea edle-le Cobl	ing vas ed vas ; Persis -Persis aved deaved e ble - gr and; Mi Organic	cular; stent; tent; eciduo evergre avel; ud;		Se Inte	empora Sate eason Seas emi-Pe ermitte Artificia t./semi	xample arily flo turated ally flood./s erm. flo ntly ex ally floo perm./s ed/peri	oded(A (B); oded(C sat.(E); oded(F posed(ded(K) Seas. (f); G); G); ; Y);	Mixos Ci Alka Orga Be Dra	Hypersai Eusalir Mixosaline(9 Acid Circumne Alkaline/calt Organic(g); Beaver(b): Drained/di Farme Diked/impo Artificial Su	ne(8); P); Fres d(a); eutral(d lcareou Minera); Partia litched(ed(f); punded	e(8); ; Fresh(0); a); utral(c); careous(i); Mineral(n); Partially ched(d); d(f); unded(h);		
															onpoo	оч, рол	monan	ι(Ζ)			ubstrate kcavate			
	• Ma	_						ap of th			ding re	elevar	t porti						Spoi	il(s); Ex	cavate	ed(x)	classe	es,
Scale	: 1 sq.	. =									ding re	elevar	t porti						Spoi	il(s); Ex	cavate	ed(x)	classe	es,
Scale		. =									ding re	elevar	t porti						Spoi	il(s); Ex	cavate	ed(x)	classe	es,
Scale	: 1 sq.	. =									ding re	elevar	t porti						Spoi	il(s); Ex	cavate	ed(x)	classe	es,
cale	: 1 sq.	. =									ding re	elevan	t porti						Spoi	il(s); Ex	cavate	ed(x)	classe	es,
cale	: 1 sq.	. =									ding re	elevar	t porti						Spoi	il(s); Ex	cavate	ed(x)	classe	es,
Scale	: 1 sq.	. =									ding re	elevan	t porti						Spoi	il(s); Ex	cavate	ed(x)	classe	es,
Scale	: 1 sq.	. =									ding re	elevan	t porti						Spoi	il(s); Ex	cavate	ed(x)	classe	es,
Scale	: 1 sq.	. =									ding re	elevan	t porti						Spoi	il(s); Ex	cavate	ed(x)	classe	es,
Scale	: 1 sq.	. =									ding re	elevan	it porti						Spoi	il(s); Ex	cavate	ed(x)	classe	98,
Scale	: 1 sq.	. =									ding re	elevan	it porti						Spoi	il(s); Ex	cavate	ed(x)	classe	es,
Scale	: 1 sq.	. =									ding re	elevan	it porti						Spoi	il(s); Ex	cavate	ed(x)	classe	98,
Scale	: 1 sq.	. =									ding re	elevan	it porti						Spoi	il(s); Ex	cavate	ed(x)	classe	998,
Scale	: 1 sq.	. =									ding re	elevan	it porti						Spoi	il(s); Ex	cavate	ed(x)	classe	

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable	Condition	
Score	Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1 Score

0.63

Notes: AA is a man-made ditch. Little historical wetlands in the area.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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	Comments/description
		Major Highway	
barriers	Х	Secondary Highway	US 50, 287, 196
arri	Х	Tertiary Roadway	Several county roads
	Х	Railroad	
cia		Bike Path	
artificial		Urban Development	
= =	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
Stressors	Х	Fence	
res	Х	Ditch or Aqueduct	
š		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA.
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	✓	Stressors	Comments/description
Se	х	Industrial/commercial	Some commercial lots nearby.
		Urban	
uĝ		Residential	
Changes	Х	Rural	Some residential lots nearby.
		Dryland Farming	
Use	Х	Intensive Agriculture	Plowed fields
and		Orchards or Nurseries	
Ľa		Livestock Grazing	
II		Transportation Corridor	
ors		Urban Parklands	
SS		Dams/impoundments	
Stressors		Artificial Water body	
0)		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
×	Culverts or Constrictions	Several bridges over canal
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
×	Storm Drain/Urban Runoff	Town of Lamar
	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
×	Actively Managed Hydrology	Flow to canal controlled.

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	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	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	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	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	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
×	Hardened/Engineered Channel	Engineered channel
	Enlarged Channel	
×	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	Functioning	Between 10 and 33% of the AA is affected by <i>in situ</i> 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	Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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	
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
×	Hardened/Engineered Channel	Engineered channel
	Artificial Stream Banks	
	Weirs	
×	Confined Bridge Openings	Many in study area

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	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	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc.	
		Grading	
	-	Compaction	
	eneral	Plowing/Disking	
	en	Excessive Sedimentation	
	Ō	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
	<u> </u>	Excessive Bank Erosion	
	Only	Channelization	
	SIS	Reconfigured Stream Channels	
×	hannels	Artificial Banks/Shoreline	
	Jar	Beaver Dam Removal	
	ਹ	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Ctomolowal	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		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	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	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

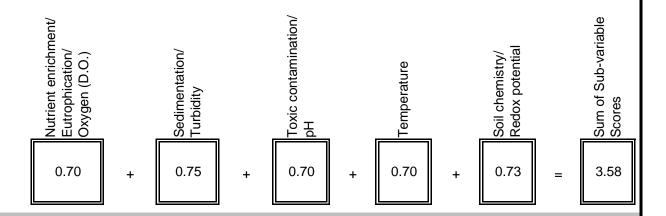
Stressor Category	Stressor Indicator	√	Comments		Sub-
	Livestock	Х	CAFOs in area	\neg	variable
	Agricultural Runoff	Х		$\neg \setminus$	Score
Nutrient Enrichment/	Septic/Sewage				0.70
Eutrophication/	Excessive Algae or Aquatic Veg.				0.70
Oxygen (D.O.)	Cumulative Watershed NPS			7	
	CDPHE Impairment/TMDL List			\Box / \Box	
				_ Y	
	Excessive Erosion			$\supset \setminus$	
	Excessive Deposition			$\neg \setminus$	
	Fine Sediment Plumes			┐ \	
Sedimentation/	Agricultural Runoff	х			0.75
Turbidity	Excessive Turbidity				0.75
Turbidity	Nearby Construction Site			\Box /	
	Cumulative Watershed NPS			\Box /	
	CDPHE Impairment/TMDL List			\Box / \Box	
				_Y	
	Recent Chemical Spills			٦ .	
	Nearby Industrial Sites			\neg \	
	Road Drainage/Runoff	Х		$\neg \setminus$	
	Livestock	Х	CAFOs in area	$\sqcap \setminus$	
	Agricultural Runoff	х		\neg	
Toxic contamination/	Storm Water Runoff	Х	Town of Lamar		0.70
pH	Fish/Wildlife Impacts				0.70
рп	Vegetation Impacts			7 /	
	Cumulative Watershed NPS			\Box /	
	Acid Mine Drainage			\Box /	
	Point Source Discharge			\Box /	
	CDPHE Impairment/TMDL List			□/	
	Metal staining on rocks and veg.				
	Excessive Temperature Regime			$\supset \setminus$	
	Lack of Shading	Х		\supset \setminus	
	Reservoir/Power Plant Discharge				0.70
Temperature	Industrial Discharge				0.70
	Cumulative Watershed NPS] /	
	CDPHE Impairment/TMDL List			\Box / \Box	
]/	
	Unnatural Saturation/Desaturation			\mathbb{I}	
Soil chemistry/	Mechanical Soil Disturbance				0.73
_	Dumping/introduced Soil	Х			0.73
Redox potential	CDPHE Impairment/TMDL List			コノ	
				\Box /	
					

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

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

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	Scoring Rules							
Ocore	Olass	Single Factor		Composite Score					
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5					
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5					
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0					
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5					
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0					

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required in cases where a stratum has been thinned or removed, enter the expected coverage of that laye **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	\	/egetatio	n Layers	;	
Layers Scored (check boxes to right to indicate scored layers)					
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds					-
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization			Х		
Dewatering					
Over Saturation					
Percent Cover of Layer	0.00 +	0.00 +	##### +		= 100
	Х	Х	Х	Х	<u> </u>
Veg. Layer Sub- variable Score	0.6	0.6	0.78		See sub-variable scoring guidelines on following page
	II	II	II	II	u
Weighted Sub-variable Score	0.00 +	0.00 +	78.00 +		= 78
					Variable 9 Score

Sub-variable 9 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 Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 the 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, howe 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.

VARIA	BLE SCORE	TABLE									
& ape xt	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0.63	,							
Buffer & Landscape Context	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0.63	}							
Bi C	Variable 3:	Buffer Capacity	0.65	;							
ogy	Variable 4:	Water Source	0.70)							
Hydrology	Variable 5:	Water Distribution	0.70								
Į	Variable 6:	Water Outflow	0.70)							
and bitat	Variable 7:	Geomorphology	0.65	;							
Abiotic and Biotic Habitat	Variable 8:	Chemical Environment	0.75	;							
Abi Bioti	Variable 9:	Vegetation Structure and Complexity	0.78	;							
Function	al Capacity	Indices									
Function 1	Support of C	Total naracteristic Wildlife Habitat Functional			Functional Capacity						
V1 _{wetloss}	+ V2 _{barriers} +	V3 _{buffer} + (2 x V9 _{veg}) Points		_	Index						
0.63	+ 0.63 +	0.65 + 1.56 + + = 3.47	÷ 5	=	0.69						
Function 2	Function 2 Support of Characteristic Fish/aquatic Habitat										
(3 x V4 _{source})	+ (2 x V5 _{dist}) +	2 x V6 _{outflow} + V8 _{chem} + V7 _{geom}	1	Г							
2.10	+ 1.40 +	1.40 + 0.75 + 0.65 + = 6.30	÷ 9	=	0.70						
	Flood Attenu										
V3 _{buffer}		$(2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{geom} + V9_{veg}$	· _	F							
0.65	+ 1.40 +	1.40 + 1.40 + 0.65 + 0.78 = 6.28	÷ 9	=	0.70						
		ong-term Water Storage									
V4 _{source}	+ (2 x V5 _{dist}) +		i _	F	0.00						
0.70	+ 1.40 +	1.40 + 0.65 + = 4.15	÷ 6	=	0.69						
	Nutrient/Toxi										
	+ V8 _{chem} +	V7 _{geom}		ſ	0.70						
1.40	+ 0.75 +	0.65 + + + = 2.80	÷ 4	<u>=</u> [0.70						
	$\frac{ \text{ Sediment Re}}{+ (2 \times V7_{qeo})} +$	tention/Shoreline Stabilization									
V3 _{buffer} 0.65	+ 1.30 +	1.56 + + + = 3.51	÷ 5	_	0.70						
	<u> </u>	xport/Food Chain Support	- 5	[<u> </u>						
V1 _{wetloss}	+2 x V6 _{outflow} +	$V8_{\text{chem}} + V7_{\text{geo}} + (2 \times V9_{\text{veg}})$									
0.63	+ 1.40 +		÷ 7	=	0.71						
		Sum of Individual FCI	Scores	;	4.90						

Divide by the Number of Functions Scored ÷ 7

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

				5 / 7				
General Info	rmation			Date of Evaluation:	12/17/20	12		
Site Name or ID:	: Wetland 2			Project Name:	US 287 L	₋amar Bypas	s	
404 or Other Pe	rmit		A	CDOT				
Evaluator Name	Elly Weber (s):		Applicant Name: Evaluator's professional position and organization: Biologist, Pinyon Environal position and organization:					
Location Info	ormation:							
Site Location (Lat./Long. or UTM):	38.112661°, -1	02.631584°		Datum Used (NAD 83	NAD 83			
USGS Quadranç Map:	gle Lamar East			Map Scale: (Circle one)	1:24,000 1:100,000 Other 1:			
Sub basin Name	11020009			Wetland Ownership:	Private			
Project Infor	mation:		х	Potentially Im	pacted We	etlands		
This evaluation i being performed (Check applicable	s x Project We		Purpose of Evaluation (check all applicable):	Mitigation; Pro Mitigation; Po Monitoring Other (Describ	e-construc st-constru	etion		
Intent of Project:	(Check all applicable)	ĺ	Restortation	☐ En	hancemen	t 🗆	Creation	
Total Size of We (Record Area, Check Measurement Metho	k and Describe	ac.	x Measured 0.02 Estimated	27				
	ea (AA) Size(Record box. Additional spaces are		x Measured	ac. 0.027	ac.	ac.	ac.	
	when more than one AA is	ac.	Estimated	ac.	ac.	ac.	ac.	
Characteristics of AA boundary de	or Method used for termination:	This AA is a series of fringe shrub-scrub wetlands along the banks of an unnaditch flowing south from Vista Del Rio Ditch.						
Notes: W	/etland is grazed and	d mowed. H	eavy agriculural inf	luence.				

ECOLOGICAL DESCRIPTION 1

Special Cor	ncerns	Check all that apply						
	s including Histosols or I e AA (i.e., AA includes o				•	ened or end o occur in th	•	species are
	irectly impact organic so eas possessing either Hi							
	s are known to occur any vetland of which the AA					cern accordi P) are know		Colorado Natural r in the AA?
The wetland urbanized la	is a habitat oasis in an ondscape?	otherwise dry or	х		lement occi		•	conservation area s determined by
	eatened or endangered AA? List Below.	species are KNOWN to		Othe	er special c	oncerns (ple	ase desc	cribe)
<u> </u>								
	ŀ	IYDROGEOMOR	PHI	C S	ETTING	}		
AA wetland If the above	has been subject to che is checked, please de	ntal natural hydrogeomo nange in HGM classes a scribe the original wetla	s a re	sult (of anthropo			ow.
X AA wetland	was created from an u	-						
Current Cor	nditions	Describe the hydrogeor that apply.	morph	ic se	etting of the	wetland by	/ circling	all conditions
	Water source	Surface flow	C	Frou	ndwater	Precipita	ation	Unknown
	Hydrodynamics	Unidirectional	Vertical			Bi-direct	ional	
	Wetland Gradient	0 - 29	%	2-4%		4-10% >109		%
	# Surface Inlets	Over-bank		0 (2	3	>3
HGM Setting	# Surface Outlets		()	(1)	2	3	>3
	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	This wetland is a series unnamed ditch.	of frir					e banks of an
	HGM class	Riverine		S	Slope	Depress	ional	Lacustrine
Historical Co	nditions							
	Water source	Surface flow	C	rou	ndwater	Precipit	ation	Unknown
Danis de la constitución de	Hydrodynamics	Unidirectional		Ve	rtical			
Previous wetland typology	Geomorphic Setting (Narrative Description)	Historically upland						
	Previous HGM Class	Riverine		S	Slope	Depress	ional	Lacustrine
		HGM subclass and regio prically upland setting.	nal su	ıbcla	ss): This is	a man-ma	de canal	, therefore the

ECOLOGICAL DESCRIPTION 2

Syste	em	Subsyst		tem		Clas	S			ıbcla					er Re					1odifi	l. (197 ers	% /	ΑА		
River		Palustrine						SS		R			scula	ar		vac	E	girric			101 11	10 0	0.0	10	
acustrine alustrine		Littora Limno Palust	ral		Unco Aqua Rock	atic Be	om(UB) ed(AB) re(RS)	Dr.	Roote Algal Non-	ng vas ed vas ; Persis	cular; stent; stent;	16.	S	empora Sat eason Seas	xample arily flo turated ally flood./s	oded(A (B); oded(C sat.(E);	;	Mixos Ci Alka	Eusali saline(s Acid rcumno line/cal	9); Fres d(a); eutral(d lcareou	sh(0); c); us(i);				
Lower perenni Upper perenni Intermittent				Unco Em Shru For	Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic				Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)			Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)													
									·				Int.	expos	ed/per	menan	t(Z)	Artif	icial Ši	ubstrate	e(r);				
	_				⁄ a ske		ap of th					t porti						Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,		
Site M Scale: 1 s	sq. =				⁄ a ske							t porti						Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,		
scale: 1 s	sq. =				⁄ a ske							t porti						Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,		
cale: 1 s	sq. =				⁄ a ske							t porti						Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,		
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cale: 1 s	sq. =				⁄ a ske							t porti						Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	<i>98,</i>		
cale: 1 s	sq. =				⁄ a ske							it porti						Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	<i>es,</i>		
cale: 1 s	sq. =				⁄ a ske							t porti						Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	Classe	<i>98,</i>		
cale: 1 s	sq. =				⁄ a ske							t porti						Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	<i>98,</i>		
cale: 1 s	sq. =				⁄ a ske							t porti						Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	Classe	<i>⇒s,</i>		
cale: 1 s	sq. =				⁄ a ske							t porti						Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe			
cale: 1 s	sq. =				⁄ a ske							t porti						Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	Classe			
cale: 1 s	sq. =				⁄ a ske							t porti						Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	200		

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

No

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

:0.6	A /	Less than 25% of the historical wetland habitat area within the HCE still (more than 70% of habitat lost).	in existence
		Variable 1 Score	0.63
		•	
tes:			

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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	Comments/description
		Major Highway	
barriers	Х	Secondary Highway	US 50/287
arri	Х	Tertiary Roadway	Several roads
		Railroad	
cia		Bike Path	
artificial		Urban Development	
ا ا	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
Stressors	Х	Fence	
res	Х	Ditch or Aqueduct	
St		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines		
1.0 - 0.9	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	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. 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.		
<0.8 - 0.7	Functioning			
<0.7 - 0.6	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	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.		

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA.
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	✓	Stressors	Comments/description
		Industrial/commercial	
SO		Urban	
Changes		Residential	
ha	Х	Rural	Residential and commercial nearby
		Dryland Farming	
Use	Х	Intensive Agriculture	Plowed fields
		Orchards or Nurseries	
Land		Livestock Grazing	
II		Transportation Corridor	
ors		Urban Parklands	
SSS		Dams/impoundments	
Stressors		Artificial Water body	
0)		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines		
1.0 - 0.9 Reference Standard		No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.		
<0.9 - 0.8 Highly Functioning		Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, either because land use is not intensive, for example naying, light grazing, or low intensity silviculture, or more substantial changes occur in approximately less than 10% of the BA.		
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.		
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.		

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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
×	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
×	Culverts or Constrictions	Several bridges over canal
×	Point Source (urban, ind., ag.)	CAFO
	Non-point Source	
	Increased Drainage Area	
×	Storm Drain/Urban Runoff	Town of Lamar
	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
×	Actively Managed Hydrology	Flow to canal controlled.

Variable Score	Condition Class	Depletion	Augmentation		
1.0 - 0.9	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	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	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 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	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.		

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score Condition Class		Non-riverine	Riverine
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	Functioning	•	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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	
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Condition Class		Scoring Guidelines			
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.			
<0.9 - 0.8 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	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.			
<0.7 - 0.6	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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc.	
×		Grading	
	ral	Compaction	
	ers	Plowing/Disking	
×	Gener	Excessive Sedimentation	
	9	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
	n y	Excessive Bank Erosion	
×	ō	Channelization	
	els	Reconfigured Stream Channels	
×	nne	Artificial Banks/Shoreline	
	Char	Beaver Dam Removal	
	ਹ	Substrate Embeddedness	
×		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines	
1.0 - 0.9	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 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 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	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

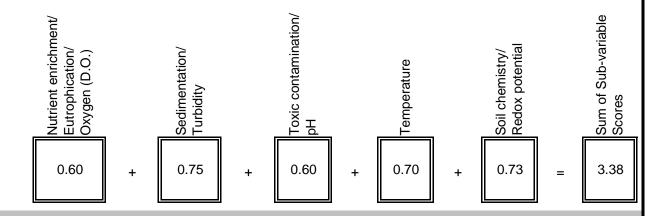
Stressor Category	Stressor Indicator	√	Comments		Sub-
	Livestock	Х	CAFO		variable
	Agricultural Runoff	Х		$\neg \setminus$	Score
Nutrient Enrichment/	Septic/Sewage				0.60
Eutrophication/	Excessive Algae or Aquatic Veg.				0.00
Oxygen (D.O.)	Cumulative Watershed NPS			7	
	CDPHE Impairment/TMDL List			7/	
				⊐ /	
	Excessive Erosion			_\	
	Excessive Deposition			I I	
	Fine Sediment Plumes			7 N	
Sedimentation/	Agricultural Runoff	х			0.75
Turbidity	Excessive Turbidity				0.75
Turbidity	Nearby Construction Site			\Box /	
	Cumulative Watershed NPS			기 /	
	CDPHE Impairment/TMDL List			7/	
				_ Y	
	Recent Chemical Spills			٦.	
	Nearby Industrial Sites			7\	
	Road Drainage/Runoff	х		$\neg \setminus$	
	Livestock	х	CAFO	기 \	
	Agricultural Runoff	Х		□ \	
Toxic contamination/	Storm Water Runoff	Х	Town of Lamar		0.60
pH	Fish/Wildlife Impacts				0.60
рп	Vegetation Impacts			7 /	,
	Cumulative Watershed NPS			\Box /	
	Acid Mine Drainage			\Box /	
	Point Source Discharge			\Box /	
	CDPHE Impairment/TMDL List			□/	
	Metal staining on rocks and veg.				
	Excessive Temperature Regime			$\supset \setminus$	
	Lack of Shading	Х		\supset \setminus	
	Reservoir/Power Plant Discharge				0.70
Temperature	Industrial Discharge				0.70
	Cumulative Watershed NPS			\Box /	
	CDPHE Impairment/TMDL List			7/	
]/	
	Unnatural Saturation/Desaturation				
Soil chomistry/	Mechanical Soil Disturbance] `	0.73
Soil chemistry/	Dumping/introduced Soil	Х			0.73
Redox potential	CDPHE Impairment/TMDL List			\Box /	
				\supset	

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

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

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	Scoring Rules					
Score		Single Factor		Composite Score			
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5			
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5			
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0			
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5			
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0			

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required in cases where a stratum has been thinned or removed, enter the expected coverage of that laye **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	Vegetation Layers			;	
Layers Scored (check boxes to right to indicate scored layers)					
Stressor	Tree	Shrub	Herb	Aquatio	Comments
Noxious Weeds					
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization			Х		
Dewatering					
Over Saturation					
Percent Cover of Layer	0.00	+ 0.00	1.00 +		= 1
	Х	X	X	Х	
Veg. Layer Sub- variable Score	0.6	0.78	0.67		See sub-variable scoring guidelines on following page
	II	II	II	II	L
Weighted Sub-variable Score	0.00	+ 0.00 +	0.67 +		= 0.67
					Variable 9 Score

Sub-variable 9 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 Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 the 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, howe 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.

VARIA	BLE SCORE	TABLE		_
& ape xt	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0.63	
Buffer & Landscape Context	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0.65	
Lar C	Variable 3:	Buffer Capacity	0.65	
gy	Variable 4:	Water Source	0.70	
Hydrology	Variable 5:	Water Distribution	0.70	
Ť	Variable 6:	Water Outflow	0.70	
and bitat	Variable 7:	Geomorphology	0.67	
Abiotic and Biotic Habitat	Variable 8:	Chemical Environment	0.67	
Abie Bioti	Variable 9:	Vegetation Structure and Complexity	0.67	
Function	al Capacity	Indices		_
Function 1 -	Support of C	Total naracteristic Wildlife Habitat Functional		Functional Capacity
	+ V2 _{barriers} +	V3 _{buffer} + (2 x V9 _{veg}) Points	_	Index
0.63	+ 0.65 +	0.65 + 1.34 + + = 3.27	÷ 5 =	0.65
Function 2	Support of C	naracteristic Fish/aquatic Habitat		
(3 x V4 _{source})	+ (2 x V5 _{dist}) +	2 x V6 _{outflow} + V8 _{chem} + V7 _{geom}		[
2.10	+ 1.40 +	1.40 + 0.67 + 0.67 + 6.24	÷ 9 =	0.69
	Flood Attenu			
V3 _{buffer}	+(2 x V4 _{source} +	$(2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{geom} + V9_{veg}$	•	
0.65	+ 1.40 +	1.40 + 1.40 + 0.67 + 0.67 = 6.19	÷ 9 =	0.69
		ong-term Water Storage		
	+ (2 x V5 _{dist}) +		1	
0.70	+ 1.40 +	1.40 + 0.67 + + = 4.17	÷ 6 =	0.70
	Nutrient/Toxi			
	+ V8 _{chem} +	V7 _{geom}	1 ,	
	+ 0.67 +	0.67 + + + = 2.74	÷ 4 =	0.69
		tention/Shoreline Stabilization		
	+ (2 x V7 _{geo}) +		1	0.07
0.65	+ 1.34 +		÷ 5 =	0.67
		xport/Food Chain Support		
	+ 2 x V6 _{outflow} + + 1.40 +	$V8_{chem}$ + $V7_{geo}$ + $(2 \times V9_{veg})$ 0.67 + 0.67 + 1.34 + = 4.71	÷ 7 =	0.67
			_	4.75
		Sum of Individual FCI	Scores	4.75

Divide by the Number of Functions Scored ÷ 7

Composite FCI Score 0.68

ADMINISTRATIVE CHARACTERIZATION

General Info	rmation		Date of Evaluation				12/14/2012		
Site Name or ID	: Wetland 3 (An	nity Canal)			Project Name:	US 287 L	amar Bypass	5	
404 or Other Pe Application #:	rmit	A				CDOT			
Evaluator Name	Elly Weber (s):			Evaluator's profes	sional position and organization:	Biologist,	Pinyon Envi	ronmental	
Location Info	ormation:								
Site Location (Lat./Long. or UTM):	38.121974°, -1	02.617463°			Datum Used (NAD 83	NAD 83			
USGS Quadranç Map:	gle Lamar East				Map Scale: (Circle one)	(1:24,000 Other	P1:100,000 1:	
Sub basin Name	11020009				Wetland Ownership:	Private			
Project Infor	mation:			х	Potentially Im	pacted We	etlands		
This evaluation i being performed (Check applicable	x Project Well at: Mitigation S			Purpose of Evaluation (check all applicable):	Mitigation; Pro Mitigation; Po Monitoring Other (Describ	e-construc st-constru	tion		
Intent of Project:	: (Check all applicable)			Restortation	☐ En	hancement		Creation	
Total Size of We (Record Area, Check Measurement Metho	k and Describe	ac.	X	Measured 0.00 Estimated	08				
	ea (AA) Size(Record e box. Additional spaces are		Х	Measured	ac. 0.008	ac.	ac.	ac.	
	when more than one AA is	ac.		Estimated	ac.	ac.	ac.	ac.	
Characteristics of AA boundary de	This AA is a	ı sn	nall set of fringe	wetlands alon	g the bank	s of Amity Ca	anal.		
Notes: T	poradic and	inco	onsistent.						

ECOLOGICAL DESCRIPTION 1

Special Cor	cerns	Check all that apply						
	s including Histosols or F e AA (i.e., AA includes o				-	ened or end o occur in th	-	species are
	Project will directly impact organic soil portions of the AA including areas possessing either Histosol soils or histic epipedons.							
	s are known to occur any vetland of which the AA					cern accordi P) are know		Colorado Natural r in the AA?
The wetland urbanized la	is a habitat oasis in an ondscape?	otherwise dry or	Х		ment occu		•	conservation area s determined by
	eatened or endangered AA? List Below.	species are KNOWN to		Other	special co	oncerns (ple	ease desc	cribe)
	ŀ	IYDROGEOMOR	PHI	C SE	TTINC	3		
AA wetland If the above	has been subject to che is checked, please de	ntal natural hydrogeomo nange in HGM classes a scribe the original wetla	s a re	sult of	anthropo	-		ow.
x AA wetland	was created from an u	pland setting.						
Current Cor	nditions	Describe the hydrogeor that apply.	morph	ic setti	ing of the	wetland by	/ circling	all conditions
	Water source	Surface flow	Groundwater		Precipitation		Unknown	
	Hydrodynamics	Unidirectional	Vertical		cal	Bi-directional		
	Wetland Gradient	0 - 20	%	2-4	4%	4-10%	>10	%
	# Surface Inlets	Over-bank		0 (1	2	3	>3
HGM Setting	# Surface Outlets		()	(1)	2	3	>3
. Tem county	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	This wetland is a series	of frir	nge we	etlands al	ong Willow	Creek.	
	HGM class	Riverine		Slo	pe	Depress	ional	Lacustrine
Historical Co	nditions							
	Water source	Surface flow	C	round	lwater	Precipita	ation	Unknown
	Hydrodynamics	Unidirectional		Verti	cal			
Previous wetland typology	Geomorphic Setting (Narrative Description)							
	Previous HGM Class	Riverine		Slo	ре	Depress	ional	Lacustrine
	ormation on the AA's Feen created from a histo	HGM subclass and region or ically upland setting.	nal su	bclass	s): This is	a man-ma	de canal	, therefore the

ECOLOGICAL DESCRIPTION 2

Syst	tem	Sub	osyst	tem		Clas	s		Su	bcla	SS		,	Wate	er Re	aime	;	Oth	ner N	1odifi	ers	%	ΑА
Riverine			lustri			SS		R	oote			ır			Е	<i>3</i> ·····							00
• · · · · · · · · · · · · · · · · · · ·		Limnoral Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Lower perennial; Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Rock Bot. (RB) Floating vascular; Rooted vascular; Algal; Persistent; Non-Persistent; Broad-leaved deviduous; Needle-leaved deviduous; Needle-leaved deviduous; Intermittently exposed(G)		Limnoral Palustrine Lower perennial;			Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US)			;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	Mixos Ci Alkal Orga Bea	Eusalisaline(s Acid rcumniline/ca line(g); aver(b)	aline(7) ine(8); 9); Free d(a); eutral(dereoute); Mineralite bitched ed(f);	sh(0); c); us(i); al(n); ally									
		Interm	ittent			rested	(FO)			nd; Mu Irganic					ed/per	Seas. (menan			ed/imp	ounde			
	_	Interm	ittent		For	rested	(FO) eap of the		С	rganic		t porti	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ed/impe icial Su il(s); Ex	ounded ubstrat xcavate	e(r); ed(x)	classe	es,
Site N	sq. =	Interm	ittent		For	rested	ap of th		С	rganic		t porti	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ed/impe icial Su il(s); Ex	ounded ubstrat xcavate	e(r); ed(x)	classe	es,
cale: 1	_	Interm	ittent		For	rested	ap of th		С	rganic		t porti	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ed/impe icial Su il(s); Ex	ounded ubstrat xcavate	e(r); ed(x)	classe	es
cale: 1	sq. =	Interm	ittent		For	rested	ap of th		С	rganic		t porti	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ed/impe icial Su il(s); Ex	ounded ubstrat xcavate	e(r); ed(x)	classe	es
cale: 1	sq. =	Interm	ittent		For	rested	ap of th		С	rganic		t porti	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ed/impe icial Su il(s); Ex	ounded ubstrat xcavate	e(r); ed(x)	classe	es
cale: 1	sq. =	Interm	ittent		For	rested	ap of th		С	rganic		t porti	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ed/impe icial Su il(s); Ex	ounded ubstrat xcavate	e(r); ed(x)	classe	es
cale: 1	sq. =	Interm	ittent		For	rested	ap of th		С	rganic		t porti	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ed/impe icial Su il(s); Ex	ounded ubstrat xcavate	e(r); ed(x)	classe	es
cale: 1	sq. =	Interm	ittent		For	rested	ap of th		С	rganic		t porti	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ed/impe icial Su il(s); Ex	ounded ubstrat xcavate	e(r); ed(x)	classe	es
cale: 1	sq. =	Interm	ittent		For	rested	ap of th		С	rganic		t porti	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ed/impe icial Su il(s); Ex	ounded ubstrat xcavate	e(r); ed(x)	classe	ess
cale: 1	sq. =	Interm	ittent		For	rested	ap of th		С	rganic		t porti	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ed/impe icial Su il(s); Ex	ounded ubstrat xcavate	e(r); ed(x)	classe	985
cale: 1	sq. =	Interm	ittent		For	rested	ap of th		С	rganic		t porti	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ed/impe icial Su il(s); Ex	ounded ubstrat xcavate	e(r); ed(x)	classe	ess

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1	Score

0	6	3

notes:	HISTORICAL	upianu	seung

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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	Comments/description
		Major Highway	
barriers	х	Secondary Highway	US 196
arri	Х	Tertiary Roadway	Several county roads
	Х	Railroad	
cia		Bike Path	
artificial		Urban Development	
ا ا	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
Stressors	Х	Fence	
res	Х	Ditch or Aqueduct	
St		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA.
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	✓	Stressors	Comments/description
		Industrial/commercial	
Se		Urban	
Changes		Residential	
ha	Х	Rural	Several residential lots nearby
		Dryland Farming	
Use	Х	Intensive Agriculture	Plowed fields
		Orchards or Nurseries	
Land		Livestock Grazing	
II		Transportation Corridor	
ors		Urban Parklands	
Stressors		Dams/impoundments	
Stre		Artificial Water body	
0,		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines	
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.	
<0.9 - 0.8	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.		
original buffering capacity. Moderate-intensity land uses such as dry-land farming		BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.	
coverage (up to 50%) of impermeable surfaces, bare soil, or other art considerable in-flow urban runoff or fertilizer-rich waters common. We capacity of the land has been greatly diminished it is not extinguished		Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.	
		The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.	

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
×	Culverts or Constrictions	Several bridges over canal
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
×	Storm Drain/Urban Runoff	Town of Lamar
	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
×	Actively Managed Hydrology	Flow to canal controlled.

Variable Score	Condition Class	Depletion	Augmentation	
1.0 - 0.9	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	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	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	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	Non- functioning Water source diminished enough to threaten or extinguish wetland hydrology in the AA.		Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.	

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
×	Hardened/Engineered Channel	Engineered channel
	Enlarged Channel	
×	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	
- I		

Variable Score Condition Class		Non-riverine	Riverine	
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	Functioning		In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.	
<0.7 - 0.6 Functioning Impaired		33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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	
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
×	Hardened/Engineered Channel	Engineered channel
	Artificial Stream Banks	
	Weirs	
×	Confined Bridge Openings	Many in study area

Variable Score	Condition Class	Scoring Guidelines		
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.		
<0.9 - 0.8	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	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.		
<0.7 - 0.6 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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc.	
		Grading	
	=	Compaction	
	eneral	Plowing/Disking	
	en	Excessive Sedimentation	
	Ō	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
×	Only	Excessive Bank Erosion	
×	ō	Channelization	
	SIÉ	Reconfigured Stream Channels	
×	hannels	Artificial Banks/Shoreline	Road grade
	hai	Beaver Dam Removal	
	ਹ	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines		
1.0 - 0.9	1.0 - 0.9 Reference Standard Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but it plant communities are still supported.			
<0.9 - 0.8		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	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	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

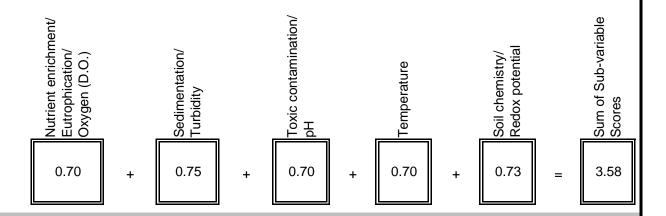
Stressor Category	Stressor Indicator	√	Comments		Sub-
	Livestock	Х	CAFOs in area	\neg	variable
	Agricultural Runoff	Х		$\neg \setminus$	Score
Nutrient Enrichment/	Septic/Sewage				0.70
Eutrophication/	Excessive Algae or Aquatic Veg.				0.70
Oxygen (D.O.)	Cumulative Watershed NPS			7	
	CDPHE Impairment/TMDL List			\Box / \Box	
				_ Y	
	Excessive Erosion			$\supset \setminus$	
	Excessive Deposition			$\neg \setminus$	
	Fine Sediment Plumes			┐ \	
Sedimentation/	Agricultural Runoff	х			0.75
Turbidity	Excessive Turbidity				0.75
Turbidity	Nearby Construction Site			\Box /	
	Cumulative Watershed NPS			\Box /	
	CDPHE Impairment/TMDL List			\Box / \Box	
				_ Y	
	Recent Chemical Spills			٦ .	
	Nearby Industrial Sites			\neg \	
	Road Drainage/Runoff	Х		$\neg \setminus$	
	Livestock	Х	CAFOs in area	$\sqcap \setminus$	
	Agricultural Runoff	х		\neg	
Toxic contamination/	Storm Water Runoff	Х	Town of Lamar		0.70
pH	Fish/Wildlife Impacts				0.70
рп	Vegetation Impacts			7 /	
	Cumulative Watershed NPS			\Box /	
	Acid Mine Drainage			\Box /	
	Point Source Discharge			\Box /	
	CDPHE Impairment/TMDL List			□/	
	Metal staining on rocks and veg.				
	Excessive Temperature Regime			$\supset \setminus$	
	Lack of Shading	Х		\supset \setminus	
	Reservoir/Power Plant Discharge				0.70
Temperature	Industrial Discharge				0.70
	Cumulative Watershed NPS] /	
	CDPHE Impairment/TMDL List			\Box / \Box	
]/	
	Unnatural Saturation/Desaturation			\mathbb{I}	
Soil chemistry/	Mechanical Soil Disturbance				0.73
_	Dumping/introduced Soil	Х			0.73
Redox potential	CDPHE Impairment/TMDL List			コノ	
				\Box /	
					

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines		
1.0 - 0.9	Reference Standard	Stress indicators not present or trivial.		
→ 0 0 − 0 9		tress indicators scarcely present and mild, or otherwise not occurring in more than 10% the AA.		
<0.8 - 0.7	Functioning	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.		
<0.7 - 0.6	Functioning Impaired	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA		
<0.6 Non-functioning		Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system		

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	Scoring Rules				
Ocore	Olass	Single Factor		Composite Score		
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5		
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5		
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0		
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5		
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0		

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required in cases where a stratum has been thinned or removed, enter the expected coverage of that laye **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

		Vegetatio	n Layers	;	
Layers Scored (check boxes to right to indicate scored layers)					
Stressor	Tree	Shrub	Herb	Aquatio	Comments
Noxious Weeds					
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization		Х	Х		
Dewatering					
Over Saturation					
Percent Cover of Layer	0.00 +	0.40 +	1.00 +		= 1.4
	Х	Х	Х	Х	<u> </u>
Veg. Layer Sub- variable Score	0.6	0.6	0.78		See sub-variable scoring guidelines on following page
	11	——	II	II	
Weighted Sub-variable Score	0.00 +	0.24 +	0.78 +		= 1.02
					Variable 9 Score

Sub-variable 9 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.

Condition Class	Scoring Guidelines
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.
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.
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.
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.
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.
	Class Reference Standard Highly Functioning Functioning Functioning Impaired

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 the 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, howe 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.

VARIA	BLE SCORE	TABLE		_					
& ape xt	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0.63						
Buffer & Landscape Context	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0.65						
Bı Lar C	Variable 3:	0.65							
ogy	Variable 4:	Water Source	0.73						
Hydrology	Variable 5:	Water Distribution	0.63						
Í	Variable 6:	Water Outflow	0.63						
and Ibitat	Variable 7:	Geomorphology	0.60						
Abiotic and Biotic Habitat	Variable 8:	Chemical Environment	0.75						
Abi	Variable 9:	Vegetation Structure and Complexity	0.73						
Function	nal Capacity	Indices							
Function 1	Support of C	haracteristic Wildlife Habitat Functional		Functional					
V1 _{wetloss}	+ V2 _{barriers} +	$V3_{\text{buffer}} + (2 \times V9_{\text{veg}})$ Functional Points	_	Capacity Index					
0.63	+ 0.65 +	0.65 + 1.46 + + = 3.39	÷ 5 =	0.68					
Function 2	Function 2 Support of Characteristic Fish/aquatic Habitat								
(3 x V4 _{source})	+ (2 x V5 _{dist}) +	2 x V6 _{outflow} + V8 _{chem} + V7 _{geom}	. i						
2.19	+ 1.26 +	1.26 + 0.75 + 0.60 + = 6.06	÷ 9 =	0.67					
	Flood Attenu								
$V3_{buffer}$	1	$(2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{geom} + V9_{veg}$	i i						
0.65	+ 1.46 +	1.26 + 1.26 + 0.60 + 0.73 = 5.96	÷ 9 =	0.66					
		ong-term Water Storage							
V4 _{source}	+ (2 x V5 _{dist}) +		ا م ا	0.04					
0.73	+ 1.26 +	1.26 + 0.60 + = 3.85	÷ 6 =	0.64					
l-	Nutrient/Toxi								
(2 x V5 _{dist})	+ V8 _{chem} + + 0.75 +	000	÷ 4 =	0.65					
		tention/Shoreline Stabilization							
V3 _{buffer}	+ (2 x V7 _{geo}) +								
0.65	+ 1.20 +		÷ 5 =	0.66					
Function 7	Production E	xport/Food Chain Support							
$V1_{\text{wetloss}}$	+ 2 x V6 _{outflow} +		ı.	 -1					
0.63	+ 1.26 +	0.75 + 0.60 + 1.46 + = 4.70	÷ 7 =	0.67					
		Sum of Individual FCI	Scores	4.64					

Composite FCI Score

Divide by the Number of Functions Scored

÷ 7

ADMINISTRATIVE CHARACTERIZATION

			_		— • • • • • • • • • • • • • • • • • • •				
General Infor	mation		Date of Evaluation				12/14/2012		
Site Name or ID:	Wetland 4 (Ar	mity Canal)			Project Name:	US 287 L	amar Bypass	3	
404 or Other Per Application #:	mit					CDOT			
Evaluator Name(Elly Webers):	Elly Weber Evaluator's profes				Biologist, Pinyon Environmental			
Location Info	rmation:								
Site Location (Lat./Long. or UTM):	38.121974°, -1	02.617463°			Datum Used (NAD 83	NAD 83			
USGS Quadrang Map:	le Lamar East				Map Scale: (Circle one)	(1:24,000 Other)1:100,000 1:	
Sub basin Name digit HUC):	(8 11020009				Wetland Ownership:	Private			
Project Inforr	mation:			х	Potentially Imp	pacted We	etlands		
This evaluation is being performed (Check applicable)	at: Mitigation S			Purpose of Evaluation (check all applicable):	Mitigation; Pre Mitigation; Po Monitoring Other (Describ	st-constru			
Intent of Project:	(Check all applicable)	Ī		Restortation	☐ En	hancement		Creation	
Total Size of Wet (Record Area, Check Measurement Method	and Describe	ac.		Measured 0.00 Estimated	627				
Assessment Area	A (AA) Size(Record box. Additional spaces are		Х	Measured	ac. 0.0627	ac.	ac.	ac.	
	when more than one AA is	ac.		Estimated	ac.	ac.	ac.	ac.	
Characteristics of AA boundary dete	This AA is a	ıse	eries of fringe we	tlands along th	ne banks c	of Amity Cana	al.		
Notes: W	etlands are sporadio	and small.							

ECOLOGICAL DESCRIPTION 1

Special Cor	ncerns	Check all that apply							
	s including Histosols or He AA (i.e., AA includes o				-	ened or end o occur in th	-	species are	
	lirectly impact organic so eas possessing either Hi								
	Organic soils are known to occur anywhere within the contiguous wetland of which the AA is part.							Colorado Natural r in the AA?	
	The wetland is a habitat oasis in an otherwise dry or urbanized landscape?						•	conservation area s determined by	
	eatened or endangered AA? List Below.	species are KNOWN to		Other	special co	oncerns (ple	ease desc	cribe)	
	H	IYDROGEOMOR	PHI	C SE	TTINC	}			
AA wetland If the above	has been subject to che is checked, please de	ntal natural hydrogeomo nange in HGM classes a scribe the original wetla	s a re	sult of	anthropo	-		ow.	
x AA wetland	was created from an u	pland setting.							
Current Cor	nditions	Describe the hydrogeor that apply.	morph	ic sett	ing of the	wetland by	/ circling	all conditions	
	Water source	Surface flow	(round	lwater	Precipita	ation	Unknown	
	Hydrodynamics	Unidirectional	Vertica		ical	Bi-direct	ional		
	Wetland Gradient	0 - 29	2-4%		4%	4-10% >10		%	
	# Surface Inlets	Over-bank		0 (1	2	3	>3	
UCM Sotting	# Surface Outlets		()	(1)	2	3	>3	
HGM Setting	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	This wetland is a series	of frin	nge we	etlands al	ong Willow	Creek.		
	HGM class	Riverine		Slo	ре	Depress	ional	Lacustrine	
Historical Co	nditions								
	Water source	Surface flow	C	round	lwater	Precipita	ation	Unknown	
	Hydrodynamics	Unidirectional		Verti	ical				
Previous wetland typology	Geomorphic Setting (Narrative Description)								
	Previous HGM Class	Riverine		Slo	ре	Depress	ional	Lacustrine	
		HGM subclass and regio prically upland setting.	nal su	bclass	s): This is	a man-ma	de canal	, therefore the	

ECOLOGICAL DESCRIPTION 2

Syste	em	Sul	hsvst	tem		Clas	S			ıbcla										n et al Iodifi		% /	ΑА
Riverine		Subsystem Palustrine		UB		Rooted vascular			Water Regime E			•			0.0	100							
acustrine Palustrine		Littora Limno Palust	ral		Unco Aqu	atic Be	m(UB)		Roote Algal	ng vas ed vas ; Persis	cular; stent;		S	empora Sat eason	xample arily flo turated ally floo	oded(A (B); oded(C	;);	Mixos	Eusali saline(9 Acid rcumn	9); Fres l(a); eutral(c	sh(0); c);		
Lower peren Upper peren Intermittent			Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Forested (FO)		Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic			Seasflood./sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)			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)												
					1 01	esteu	(10)		(Organio	0		Int.	expos	ed/per	menan		Artif	icial Ši	ubstrate	e(r);		
	_				a ske	etch m	ap of the					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	9S,
Site M Scale: 1 so	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	9S, 6
Scale: 1 s	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
cale: 1 s	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	9S,
cale: 1 s	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
cale: 1 s	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
cale: 1 s	sq. =				a ske	etch m	ap of th					ot porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
cale: 1 s	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	<i>=s,</i>
cale: 1 s	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
cale: 1 s	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	9S,
cale: 1 s	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
cale: 1 s	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	<i>98,</i>
cale: 1 s	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	<i>98,</i>
cale: 1 s	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	98,
cale: 1 s	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	<i>es,</i>
Scale: 1 s	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	
scale: 1 s	sq. =				a ske	etch m	ap of th					nt porti					t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter perimeter around the AA.
- 2. The area within this perimeter is the Habitat Connectivity Envelope (HCE)
- 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable	Condition	
Score	Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Va	riak	ole 1	l Sc	core

Λ	63

Ν	otes:	Low	amount	of	historic	wetl	and	S
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Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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	Comments/description
		Major Highway	
barriers	Х	Secondary Highway	US 50, 287
arri	Х	Tertiary Roadway	Several county roads
	Х	Railroad	
cia		Bike Path	
artificial		Urban Development	
ا ا	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
Stressors	Х	Fence	
res	Х	Ditch or Aqueduct	
St		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA.
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	✓	Stressors	Comments/description
		Industrial/commercial	
SO		Urban	
Changes		Residential	
ha	Х	Rural	Several residential lots nearby
		Dryland Farming	
Use	Х	Intensive Agriculture	Plowed fields
		Orchards or Nurseries	
Land		Livestock Grazing	
II		Transportation Corridor	
ors		Urban Parklands	
SSS		Dams/impoundments	
Stressors		Artificial Water body	
0)		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines		
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.		
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.		
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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 Functioning Impair		Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.		
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.		

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
×	Culverts or Constrictions	Several bridges over canal
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
×	Storm Drain/Urban Runoff	Town of Lamar
	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
×	Actively Managed Hydrology	Flow to canal controlled.

Variable Score	Condition Class Depletion		Augmentation		
1.0 - 0.9	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	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	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	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	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.		

Variable 4 Score

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
×	Hardened/Engineered Channel	Engineered channel
	Enlarged Channel	
×	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	Functioning	•	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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	
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
×	Hardened/Engineered Channel	Engineered channel
	Artificial Stream Banks	
	Weirs	
×	Confined Bridge Openings	Many in study area

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	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	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc.	
		Grading	
	-	Compaction	
	eneral	Plowing/Disking	
	en	Excessive Sedimentation	
	Ō	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
	Only	Excessive Bank Erosion	
	ō	Channelization	
	SIS	Reconfigured Stream Channels	
×	hannels	Artificial Banks/Shoreline	
	hai	Beaver Dam Removal	
	5	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines		
1.0 - 0.9 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		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 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	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

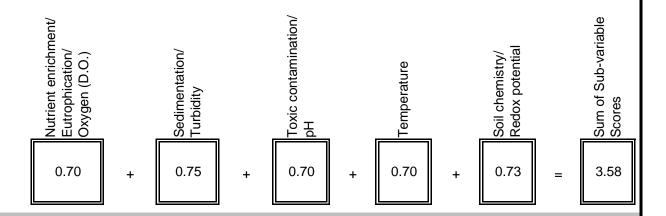
Stressor Category	Stressor Indicator	√	Comments		Sub-
	Livestock	Х	CAFOs in area	\neg	variable
	Agricultural Runoff	Х		$\neg \setminus$	Score
Nutrient Enrichment/	Septic/Sewage				0.70
Eutrophication/	Excessive Algae or Aquatic Veg.				0.70
Oxygen (D.O.)	Cumulative Watershed NPS			7	
	CDPHE Impairment/TMDL List			\Box / \Box	
				_Y	
	Excessive Erosion			$\supset \setminus$	
	Excessive Deposition			$\neg \setminus$	
	Fine Sediment Plumes			┐ \	
Sedimentation/	Agricultural Runoff	х			0.75
Turbidity	Excessive Turbidity				0.75
Turbidity	Nearby Construction Site			\Box /	
	Cumulative Watershed NPS			\Box /	
	CDPHE Impairment/TMDL List			\Box / \Box	
				_Y	
	Recent Chemical Spills			٦ .	
	Nearby Industrial Sites			\neg \	
	Road Drainage/Runoff	Х		$\neg \setminus$	
	Livestock	Х	CAFOs in area	$\sqcap \setminus$	
	Agricultural Runoff	х		\neg	
Toxic contamination/	Storm Water Runoff	Х	Town of Lamar		0.70
pH	Fish/Wildlife Impacts				0.70
рп	Vegetation Impacts			7 /	
	Cumulative Watershed NPS			\Box /	
	Acid Mine Drainage			\Box /	
	Point Source Discharge			\Box /	
	CDPHE Impairment/TMDL List			□/	
	Metal staining on rocks and veg.				
	Excessive Temperature Regime			$\supset \setminus$	
	Lack of Shading	Х		\supset \setminus	
	Reservoir/Power Plant Discharge				0.70
Temperature	Industrial Discharge				0.70
	Cumulative Watershed NPS] /	
	CDPHE Impairment/TMDL List			\Box / \Box	
]/	
	Unnatural Saturation/Desaturation			\mathbb{I}	
Soil chemistry/	Mechanical Soil Disturbance				0.73
_	Dumping/introduced Soil	Х			0.73
Redox potential	CDPHE Impairment/TMDL List			コノ	
				\Box /	
					

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

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

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	5	Scoring	Rules
Ocore	Olass	Single Factor		Composite Score
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required in cases where a stratum has been thinned or removed, enter the expected coverage of that laye **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

		٧	'egeta	tio	n Laye	rs		
Layers Scored (check boxes to right to indicate scored layers)								
Stressor	Tree		Shru	b	Herb) [Aquatic	Comments
Noxious Weeds								
Exotic/Invasive spp.								
Tree Harvest								
Brush Cutting/Shrub Removal								
Livestock Grazing								
Excessive Herbivory								
Mowing/Haying								
Herbicide								
Loss of Zonation/Homogenization					Х			
Dewatering								
Over Saturation								
Percent Cover of Layer	0.00	+	0.00	+	1.00	+		= 1
	X		Х		Х		Х	
Veg. Layer Sub- variable Score	0.6		0.6		0.78			See sub-variable scoring guidelines on following page
	II	_	II		II	_	II	
Weighted Sub-variable Score	0.00	+	0.00	+	0.78	+		= 0.78
								Variable 9 Score

Sub-variable 9 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 Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 the 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, howe 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.

VARIAI	BLE SCORE	TABLE		
& ape	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0.63	
Buffer & Landscape Context	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0.65	
Bı Lar C	Variable 3:	Buffer Capacity	0.65	
gy	Variable 4:	Water Source	0.67	
Hydrology	Variable 5:	Water Distribution	0.67	
	Variable 6:	Water Outflow	0.67	
and bitat	Variable 7:	Geomorphology	0.60	
otic a	Variable 8:	Chemical Environment	0.75	
Abiotic and Biotic Habitat	Variable 9:	Vegetation Structure and Complexity	0.78	
Function	al Capacity	Indices		
Function 1	Support of C	haracteristic Wildlife Habitat Total Functional		Functional Capacity
V1 _{wetloss}	+ V2 _{barriers} +			Index
0.63	+ 0.65 +	0.65 + 1.56 + = 3.49	÷ 5 =	0.70
Function 2	Support of C	haracteristic Fish/aquatic Habitat		
	+ (2 x V5 _{dist}) +		i 1	
2.01	+ 1.34 +	1.34 + 0.75 + 0.60 + = 6.04	÷ 9 =	0.67
	Flood Attenu			
V3 _{buffer}		$(2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{geom} + V9_{veg}$	l _	
0.65	+ 1.34 +		÷ 9 =	0.67
		ong-term Water Storage		
V4 _{source}	+ (2 x V5 _{dist}) +			0.66
0.67	+ 1.34 +	1.34 + 0.60 + = 3.95	÷ 6 =	0.66
·	Nutrient/Toxi + V8 _{chem} +	cant Removal V7 _{geom}		
1.34	+ V8 _{chem} + + 0.75 +		÷ 4 =	0.67
Function 6	Sediment Re	tention/Shoreline Stabilization		,
V3 _{buffer}	+ (2 x V7 _{geo}) +			
0.65	+ 1.20 +	1.56 + + + = 3.41	÷ 5 =	0.68
	Production E	xport/Food Chain Support		
V1 _{wetloss}	+ 2 x V6 _{outflow} +	V8 _{chem} + V7 _{geo} + (2 x V9 _{veg})	i 1	
0.63	+ 1.34 +	0.75 + 0.60 + 1.56 + = 4.88	÷ 7 =	0.70
		Sum of Individual FCI	Scores	4.75

Composite FCI Score

÷ 7

0.68

Divide by the Number of Functions Scored

ADMINISTRATIVE CHARACTERIZATION

General Informa	tion				Date of Evaluation:	12/14/20 ⁻	12	
Site Name or ID:	Wetland 5 (Vis Ditch)	sta Del Rio			Project Name:	US 287 L	amar Bypas	s
404 or Other Permit Application #:				A	oplicant Name:	CDOT		
Evaluator Name(s):	Elly Weber		Evalu	ator's profes	sional position and organization:	Biologist,	Pinyon Envi	ronmental
Location Inform	ation:							
Site Location (Lat./Long. or UTM):	38.113331°, -1	02.632717°			Datum Used (NAD 83	NAD 83		
USGS Quadrangle Map:	Lamar East				Map Scale: (Circle one)	(1:24,000 Other	>1:100,000 1:
Sub basin Name (8 digit HUC):	11020009				Wetland Ownership:	Private		
Project Informat	ion:			х	Potentially Im	pacted We	etlands	
This evaluation is being performed at: (Check applicable box)	x Project We		Eval	ose of uation ck all cable):	Mitigation; Pre Mitigation; Po Monitoring Other (Describ	st-constru		
Intent of Project: (Che	ck all applicable)	I	Resto	rtation	☐ En	hancement		Creation
Total Size of Wetland (Record Area, Check and Measurement Method Use	Describe	ac.	x Meas Estim	ured 0.01 ated	6			
Assessment Area (A. Area, check appropriate box.			Meas	ured	0.016	ac.	ac.	ac.
used to record acreage when included in a single assessme	more than one AA is	ac.	Estim	ated	ac.	ac.	ac.	ac.
Characteristics or Me AA boundary determi		This AA is V Ditch.	VL-5, whi	ch is a PE	EM wetlands sp	anning the	e width of the	e Vista Del Ric
Notes:								

ECOLOGICAL DESCRIPTION 1

Special Cor	ncerns	Check all that apply						
	s including Histosols or He AA (i.e., AA includes o				-	ened or end o occur in th	-	species are
	irectly impact organic so as possessing either Hi							
	s are known to occur any vetland of which the AA							Colorado Natural r in the AA?
The wetland urbanized la	is a habitat oasis in an ondscape?	otherwise dry or	х		ment occu		•	conservation area s determined by
	eatened or endangered AA? List Below.	species are KNOWN to		Other	r special co	oncerns (ple	ease desc	cribe)
	H	IYDROGEOMOR	PHI	C SI	ETTINO	}		
AA wetland If the above	has been subject to che is checked, please de	ntal natural hydrogeomo nange in HGM classes a scribe the original wetla	s a re	sult of	f anthropo	-		ow.
x AA wetland	was created from an u	pland setting.						
Current Cor	nditions	Describe the hydrogeor that apply.	morph	ic set	ting of the	wetland by	/ circling	all conditions
	Water source	Surface flow	(Fround	dwater	Precipita	ation	Unknown
	Hydrodynamics	Unidirectional		Vert	ical	Bi-direct	ional	
	Wetland Gradient	0 - 29	%	2-	4%	4-10%	>10	%
	# Surface Inlets	Over-bank		0 ($\overline{\mathbb{D}}$	2	3	>3
LICM Catting	# Surface Outlets		()	(1)	2	3	>3
HGM Setting	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	This wetland is a series	s of frin	nge w	etlands al	ong Willow	Creek.	
	HGM class	Riverine		Slo	оре	Depress	ional	Lacustrine
Historical Co	nditions							
	Water source	Surface flow	C	roun	dwater	Precipita	ation	Unknown
	Hydrodynamics	Unidirectional		Vert	ical			
Previous wetland typology	Geomorphic Setting (Narrative Description)							
	Previous HGM Class	Riverine		Slo	оре	Depress	ional	Lacustrine
	ormation on the AA's Feen created from a histo	HGM subclass and region or ically upland setting.	onal su	ibclas	s): This is	a man-ma	de canal	, therefore the

ECOLOGICAL DESCRIPTION 2

Syste	em	Sul	hsvst	em		Clas	S			ıbcla										n et al Iodifi		% /	ΑА
Riveri							UB			Rooted vascular			Water Regime E				101 11	10 0	0.0	10			
acustrine Palustrine		Littora Limno Palust	ral		Unco Aqu	Jncon Bottom(UB) Aquatic Bed(AB)				ng vas ed vas ; Persis	cular; stent;		S	Examples Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seasflood./sat.(E);		Mixos	Eusali saline(9 Acid rcumn	9); Fres	sh(0); c);				
Riverine			peren		Unco Em Shru	ky Shor on Shor ergent ob-scru	re(US) (EM) b(SS)		edle-le Cobl Sa	aved e ble - gr and; Mu	ud;		Se Inte A Sat	emi-Pe ermitte Artificia t./semi	erm. floontly expended	oded(F oosed(ded(K)	F); G); ;	Organic(g); Beaver(b) Drained/di Farme Diked/impo		g); Mineral(n); (b); Partially d/ditched(d); med(f); npounded(h); Substrate(r); Excavated(x)			
					FOI	esteu	(10)		(Organio	3		Int.	expos	ed/per	menan		Artif	icial Ši	ubstrate	e(r);		
	_				⁄ a ske	etch m	ap of the					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
Site Ma	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es, :
Scale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
cale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
cale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
cale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
cale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	9S,
cale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
cale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	9S,
cale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	9S,
cale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
cale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	98,
cale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
cale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	es,
cale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	998,
Scale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	
cale: 1 s	sq. =				⁄ a ske	etch m	ap of th					nt porti				menan	t(Z)	Artif Spoi	icial Su il(s); Ex	ubstrate kcavate	e(r); ed(x)	classe	998,

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1 Score

0.63

Notes: There are very little neighboring wetlands within the HCE.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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	Comments/description
barriers		Major Highway	
	х	Secondary Highway	US 50, 287, 196
arri	Х	Tertiary Roadway	Several county roads
	Х	Railroad	
cia		Bike Path	
artificial		Urban Development	
ا ع	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
Stressors	Х	Fence	
res	Х	Ditch or Aqueduct	
St		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA.
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	✓	Stressors	Comments/description
Se	Х	Industrial/commercial	Some commercial lots nearby.
		Urban	
Changes		Residential	
ha	Х	Rural	Some residential lots nearby.
		Dryland Farming	
Use	Х	Intensive Agriculture	Plowed fields
and		Orchards or Nurseries	
Ľa		Livestock Grazing	
II		Transportation Corridor	
ors		Urban Parklands	
SS		Dams/impoundments	
Stressors		Artificial Water body	
0)		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
×	Culverts or Constrictions	Several bridges over canal
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
×	Storm Drain/Urban Runoff	Town of Lamar
	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
×	Actively Managed Hydrology	Flow to canal controlled.

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	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	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	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	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	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.

Variable 4 Score

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
×	Hardened/Engineered Channel	Engineered channel
	Enlarged Channel	
×	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	Functioning	Between 10 and 33% of the AA is affected by <i>in situ</i> 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	Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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	
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
×	Hardened/Engineered Channel	Engineered channel
	Artificial Stream Banks	
	Weirs	
×	Confined Bridge Openings	Many in study area

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	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	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
		Dredging/Excavation/Mining	
	1	Fill, including dikes, road grades, etc.	
		Grading	
	ral	Compaction	
	era	Plowing/Disking	
	enei	Excessive Sedimentation	
	Ö	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
	n y	Excessive Bank Erosion	
	ō	Channelization	
	els	Reconfigured Stream Channels	
×	Channe	Artificial Banks/Shoreline	
		Beaver Dam Removal	
		Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Ctoudoud	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		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	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	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

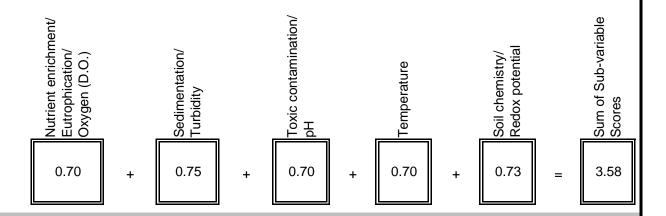
Stressor Category	Stressor Indicator	√	Comments		Sub-
	Livestock	Х	CAFOs in area	\neg	variable
	Agricultural Runoff	Х		$\neg \setminus$	Score
Nutrient Enrichment/	Septic/Sewage				0.70
Eutrophication/	Excessive Algae or Aquatic Veg.				0.70
Oxygen (D.O.)	Cumulative Watershed NPS			7	
	CDPHE Impairment/TMDL List			\Box / \Box	
				_ Y	
	Excessive Erosion			$\supset \setminus$	
	Excessive Deposition			$\neg \setminus$	
	Fine Sediment Plumes			┐ \	
Sedimentation/	Agricultural Runoff	х			0.75
Turbidity	Excessive Turbidity				0.75
Turbidity	Nearby Construction Site			\Box /	
	Cumulative Watershed NPS			\Box /	
	CDPHE Impairment/TMDL List			\Box / \Box	
				_ Y	
	Recent Chemical Spills			٦ .	
	Nearby Industrial Sites			\neg \	
	Road Drainage/Runoff	Х		$\neg \setminus$	
	Livestock	Х	CAFOs in area	$\sqcap \setminus$	
	Agricultural Runoff	х		\neg	
Toxic contamination/	Storm Water Runoff	Х	Town of Lamar		0.70
pH	Fish/Wildlife Impacts				0.70
рп	Vegetation Impacts			7 /	
	Cumulative Watershed NPS			\Box /	
	Acid Mine Drainage			\Box /	
	Point Source Discharge			\Box /	
	CDPHE Impairment/TMDL List			□/	
	Metal staining on rocks and veg.				
	Excessive Temperature Regime			$\supset \setminus$	
	Lack of Shading	Х		\supset \setminus	
	Reservoir/Power Plant Discharge				0.70
Temperature	Industrial Discharge				0.70
	Cumulative Watershed NPS] /	
	CDPHE Impairment/TMDL List			\Box / \Box	
]/	
	Unnatural Saturation/Desaturation			\mathbb{I}	
Soil chemistry/	Mechanical Soil Disturbance				0.73
_	Dumping/introduced Soil	Х			0.73
Redox potential	CDPHE Impairment/TMDL List			コノ	
				\Box /	
					

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

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

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	Scoring Rules								
Ocore	Olass	Single Factor		Composite Score						
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5						
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5						
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0						
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5						
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0						

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required in cases where a stratum has been thinned or removed, enter the expected coverage of that laye **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

		Ve	egetat	io	n Laye	rs		
Layers Scored (check boxes to right to indicate scored layers)								
Stressor	Tree		Shrul	b	Herb) [Aquatic	Comments
Noxious Weeds								
Exotic/Invasive spp.								
Tree Harvest								
Brush Cutting/Shrub Removal								
Livestock Grazing								
Excessive Herbivory								
Mowing/Haying								
Herbicide								
Loss of Zonation/Homogenization					Х			
Dewatering								
Over Saturation								
Percent Cover of Layer	0.00	+	0.00	+	1.00	+		= 1
	X	_	Х		х	. L	Х	
Veg. Layer Sub- variable Score	0.6		0.6		0.78			See sub-variable scoring guidelines on following page
	II		II		II		II	
Weighted Sub-variable Score	0.00	+[0.00	+	0.78]+[= 0.78
						- -		Variable 9 Score

Sub-variable 9 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 Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 the 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, howe 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.

6. If scoring is	s done directly in th	ne Excel spreads	sheet, all valu	es will be tra	nsferred a	ind calculate	ed automatically	' .	
VARIA	BLE SCORE	TABLE							
t pe	Variable 1:	Habitat Conr	nectivity - N	Neighborin	g Wetlaı	nd Habita	t Loss	0.63]
Buffer & Landscape Context	Variable 2:	Habitat Conr	nectivity - N	/ligration/D	ispersa	l Barriers		0.63	
La Br	Variable 3:	Buffer Capac	city		0.65	1			
gy	Variable 4:	Water Source	е					0.63	1
Hydrology	Variable 5:	Water Distrik	oution					0.63	1
Ê	Variable 6:	Water Outflo	ow					0.63	1
ınd oitat	Variable 7:	Geomorphol	ogy					0.60	1
Abiotic and Biotic Habitat	Variable 8:	Chemical En	vironment					0.75	1
Abic	Variable 9:	Vegetation S	tructure ar	nd Comple	xity			0.78	1
F otion	al Canasitu	. In allege		1					- 4
Function	nal Capacity	Indices					Total		Functional
	Support of C			bitat			Functional		Capacity
V1 _{wetloss}	+ V2 _{barriers} +		(2 x V9 _{veg})	1			Points	1	Index
0.63	+ 0.63 +	0.65 +	1.56	+	_+_	=	3.47	÷ 5 =	= 0.69
	Support of C								
	+ (2 x V5 _{dist}) +		V8 _{chem}	+ V7 _{geon}				1	
1.89	+ 1.26 +	1.26 +	0.75	+ 0.60	+	=	5.76	÷ 9 =	= 0.64
	Flood Attenu								
V3 _{buffer}	+(2 x V4 _{source} +			1 — <u> </u>		V9 _{veg}		1	
0.65	+ 1.26 +	1.26 +	1.26	+ 0.60	+	0.78	5.81	÷ 9 =	= 0.65
	Short- and Lo								
V4 _{source}	+ (2 x V5 _{dist}) +		V7 _{geom}	1				1 <u>-</u>	
0.63	+ 1.26 +	1.26 +	0.60	+	+		3.75	÷ 6 =	= 0.63
L .	Nutrient/Toxi		l						
(2 x V5 _{dist})	1	900		1				1 .	
1.26	+ 0.75 +	0.60 +		+	+		2.61	÷ 4 =	= 0.65
	Sediment Re		line Stabili	ization					_
V3 _{buffer}	+ (2 x V7 _{geo}) +			1				1 _	0.00
0.65	+ 1.20 +	1.56 +		+	+		3.41	÷ 5 =	= 0.68
-	Production E								
V1 _{wetloss}	+ 2 x V6 _{outflow} +		3	+ (2 x V9 _v			4.00	1 _	0.00
0.63	+ 1.26 +	0.75 +	0.60	+ 1.56	+		4.80	÷ 7 =	= 0.69
					Sı	ım of Ind	ividual FCI	Scores	4.62
					30	51 1110	i vidual i Ol	200163	

Divide by the Number of Functions Scored ÷ 7

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

General Inforr	mation			12/18/2012				
Site Name or ID:	Wetland 6			Project Name:	US 287 L	amar Bypass	i	
404 or Other Pern Application #:	nit		Ар	plicant Name:	CDOT			
Evaluator Name(s	Elly Weber		Evaluator's profess	uator's professional position and organization:				
Location Infor	mation:							
Site Location (Lat./Long. or UTM):	38.107916°, -1	02.619527°		Datum Used (NAD 83	NAD 83			
USGS Quadrangle Map:	e Lamar East			Map Scale: (Circle one)	(1:24,000 Other	21:100,000 1:	
Sub basin Name (digit HUC):	8 11020009			Wetland Ownership:	cement			
This evaluation is being performed a (Check applicable b	x Project We		Purpose of Evaluation (check all applicable):	Potentially Imp Mitigation; Pre Mitigation; Pos Monitoring Other (Describ	e-construct st-construc	tion		
Intent of Project: ((Check all applicable)	[Restortation	<u> </u>	nancement		Creation	
Total Size of Wetl (Record Area, Check a Measurement Method	and Describe	ac.	x Measured 0.083 Estimated	}				
Assessment Area Area, check appropriate b		ac.	x Measured	ac. 0.083	ac.	ac.	ac.	
are used to record acreas AA is included in a single	ge when more than one	ac.	Estimated	ac.	ac.	ac.	ac.	
Characteristics or AA boundary dete		This AA is V	VL-6, a fringe wetla	nd surrounding	ງ a pond a	djacent to a ς	gravel pit.	
Notes: We	etland is isolated. F	Probably not	USACE jurisdication	nal.				

ECOLOGICAL DESCRIPTION 1

Spe	ecial Cor	ncerns	Check all that apply					
		s including Histosols or e AA (i.e., AA includes o			Federally threa SUSPECTED t		-	-
	-	lirectly impact organic seas possessing either H	-					
	•	s are known to occur an vetland of which the AA	•		Species of con-			he Colorado Natural ccur in the AA?
	urbanized la Federally thr	·	otherwise dry or species are KNOWN to	X		urrence buffe	r area	ial conservation area a as determined by escribe)
		Н	YDROGEOMOR	PHI	C SETTING	3		
x	AA wetland If the above	maintains its fundame has been subject to che is checked, please de was created from an u	sult of anthropo	ogenic modif				
Cur	rent Co	nditions	Describe the hydrogeon that apply.	morph	ic setting of the	e wetland by	circlii	ng all conditions
		Water source Hydrodynamics	Surface flow Unidirectional		Groundwater Vertical	Precipitat Bi-directio	nal	Unknown
		Wetland Gradient	0 - 2%		2-4%	4-10%		0%
		# Surface Inlets	Over-bank	0		2	3	>3
HGM	Setting	# Surface Outlets Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	This wetland is a fringe		nd a pond.	2	3	>3
		HGM class	Riverine		Slope	Depressio	onai	Lacustrine
Hist	orical Co			_				
		Water source	Surface flow	G	Groundwater	Precipitat	ion	Unknown
	revious nd typology	Hydrodynamics Geomorphic Setting (Narrative Description)	Unidirectional Area was likely historica	al wet	Vertical ands associate	d with the Ar	rkans	as River
		Previous HGM Class	Riverine		Slope	Depression		Lacustrine
Note: settin	•		HGM subclass and region	onal si	ubclass): AA w	as previously	y mos	st likely an upland

ECOLOGICAL DESCRIPTION 2

Syster	n	Sul	bsyst	tem		Clas	S		Su	ıbcla	SS			Wate	er Re	egime)	Oth	ner M	/lodifi	ers	% /	AΑ
Lacustri	ne	L	ittora	al		EM		R	Rooted vascular						F							10	00
acustrine alustrine			pereni		Unco Aqu Rock Unco Em Shru	ck Bot. In Botto atic Be ky Shor on Shor nergent ub-scru rested	om(UB) ed(AB) re(RS) re(US) e(EM) eb(SS)	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); Seasflood./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)					
										organic	•		Int.	expos	ed/per	menan	t(Z)						
Site Ma	_				a ske	etch ma	ap of th					portio						Spoi	il(s); Ex	xcavate	ed(x)	sses,	an
	=	5 5 5 5 5			a ske	etch ma						portio						Spoi	il(s); Ex	xcavate	ed(x)	esses,	arı
cale: 1 sq.	=				a ske	etch ma						portio						Spoi	il(s); Ex	xcavate	ed(x)	esses,	aı
cale: 1 sq.	=				a ske	etch ma						portio						Spoi	il(s); Ex	xcavate	ed(x)	asses,	aı
cale: 1 sq.	=				a ske	etch ma						portio						Spoi	il(s); Ex	xcavate	ed(x)	esses,	aı
cale: 1 sq.	=				a ske	etch ma						portio						Spoi	il(s); Ex	xcavate	ed(x)	osses,	aı
cale: 1 sq.	=				a ske	etch ma						portion						Spoi	il(s); Ex	xcavate	ed(x)	esses,	a
cale: 1 sq.	=				a ske	etch ma						oortio						Spoi	il(s); Ex	xcavate	ed(x)	asses,	a
cale: 1 sq.	=				a ske	etch ma						oortio						Spoi	il(s); Ex	xcavate	ed(x)	asses,	aı
cale: 1 sq.	=				a ske	etch ma						portio						Spoi	il(s); Ex	xcavate	ed(x)	osses,	a
cale: 1 sq.	=				a ske	etch ma						portio						Spoi	il(s); Ex	xcavate	ed(x)	osses,	a

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

	Condition	
Variable Score	Condition	Searing Guidelines
Score	Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable	1 Score
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Notes: There are historic wetlands nearby on the Arkansas river, within the HCE.		

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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.

	V	Stressors	Comments/description
40		Major Highway	
barriers	Х	Secondary Highway	US 50, 287
arri		Tertiary Roadway	
		Railroad	
cia		Bike Path	
artificial		Urban Development	
li B	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
SOI	Х	Fence	
Stressors	Х	Ditch or Aqueduct	
₹		Aquatic Organism Barriers	
	Х	Gravel pit	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	√	Stressors	Comments/description
Se	Х	Industrial/commercial	Some commercial lots nearby.
		Urban	
ng		Residential	
Changes		Rural	
		Dryland Farming	
Use	Х	Intensive Agriculture	Plowed fields
and		Orchards or Nurseries	
Lar		Livestock Grazing	
II		Transportation Corridor	
ors		Urban Parklands	
Stressors		Dams/impoundments	
tre		Artificial Water body	
(O)	х	Physical Resource Extraction	Gravel pit
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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.

V	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
	Culverts or Constrictions	
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
×	Storm Drain/Urban Runoff	Gravel pit, tire yard upstream
	Impermeable Surface Runoff	
×	Irrigation Return Flows	
×	Mining/Natural Gas Extraction	Gravel pit
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Class	Depletion	Augmentation	
1.0 - 0.9	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	Highly or mild to moderate reduction of peak flows or		Occasional unnatural high-water events, short in 20%; 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	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	Functioning Impaired	,	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	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.	

Variable 4 Score

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	Functioning	Between 10 and 33% of the AA is affected by <i>in situ</i> 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	Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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	
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	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	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc	
		Grading	
	=	Compaction	
	eral	Plowing/Disking	
	en	Excessive Sedimentation	
	g	Dumping	
		Hoof Shear/Pugging	
×		Aggregate or Mineral Mining	Next to gravel pit.
		Sand Accumulation	
		Channel Instability/Over Widening	
	nly	Excessive Bank Erosion	
	ō	Channelization	
	SIS	Reconfigured Stream Channels	
	hannels	Artificial Banks/Shoreline	
	Jar	Beaver Dam Removal	
	ਹ	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

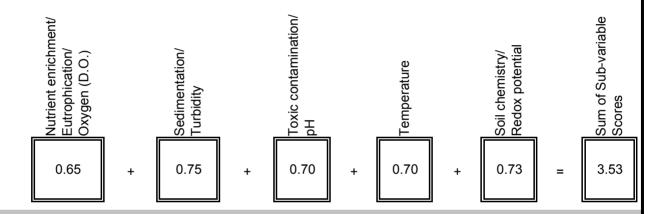
Stressor Category	Stressor Indicator	√	Comments		Sub-
	Livestock	Х	CAFOs in area	$\neg \setminus$	variable
	Agricultural Runoff	Х		\Box \setminus	Score
Nutrient Enrichment/	Septic/Sewage				0.65
Eutrophication/	Excessive Algae or Aquatic Veg.	Х	Evidence on latest aerial		0.03
Oxygen (D.O.)	Cumulative Watershed NPS			\Box	
	CDPHE Impairment/TMDL List			_//	
	Excessive Erosion			_/\	
	Excessive Deposition			_/ \	
	Fine Sediment Plumes			_ \ <u>_</u>	
Sedimentation/	Agricultural Runoff	Х			0.75
Turbidity	Excessive Turbidity				0.70
raiblaity	Nearby Construction Site			⊣ /	
	Cumulative Watershed NPS			⅃ /	
	CDPHE Impairment/TMDL List			//	
	Recent Chemical Spills			_\	
	Nearby Industrial Sites			 \	
	Road Drainage/Runoff			 \	
	Livestock	Х	CAFOs in area	_	
	Agricultural Runoff	Х		_ \ <u></u>	
Toxic contamination/	Storm Water Runoff				0.70
pH	Fish/Wildlife Impacts				0.70
ρΠ	Vegetation Impacts			_ /	
	Cumulative Watershed NPS			⅃ /	
	Acid Mine Drainage			⅃ /	
	Point Source Discharge			⅃ /	
	CDPHE Impairment/TMDL List			//	
	Metal staining on rocks and veg.			_(
	Excessive Temperature Regime			_/_	
	Lack of Shading	Х		⅃ ∖₌	
	Reservoir/Power Plant Discharge				0.70
Temperature	Industrial Discharge			_	0.7 0
	Cumulative Watershed NPS			_ / _	
	CDPHE Impairment/TMDL List			_//	
				_{(
	Unnatural Saturation/Desaturation			_/_	
Soil chemistry/	Mechanical Soil Disturbance				0.73
Redox potential	Dumping/introduced Soil			_	J 0
. todat potorition	CDPHE Impairment/TMDL List				
		I		V	

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

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

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	Scoring Rules						
Ocore	Olass	Single Factor		Composite Score				
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5				
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5				
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0				
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5				
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0				

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	'	/egetatio	n Layers		1
Layers Scored (check boxes to right to indicate scored layers)					
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds					
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization			Х		
Dewatering					
Over Saturation					
Percent Cover of Layer	0.00 +	0.00 +	1.00 +	. X	= 1
Veg. Layer Sub- variable Score	0.64	0.6	0.78		See sub-variable scoring guidelines on following page
	"	"	"		
Weighted Sub-variable Score	0.00 +	0.00 +	0.78 +		= 0.78
					Variable 9 Score

Sub-variable 9 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 Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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

VARIABLE SCORE TABLE

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 the 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.

& Ape	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0.	70				
Buffer & Landscape Context	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0.	70				
Br C	Variable 3:	Buffer Capacity	0.0	65				
gy	> Variable 4: Water Source							
drolo	Variable 4: Water Source Variable 5: Water Distribution Variable 6: Water Outflow							
H	Variable 6: Water Outflow							
and ; at	면 및 Variable 7: Geomorphology							
Abiotic and Biotic Habitat	Variable 8:	Chemical Environment	0.	74				
Abid E H	Variable 9:	Vegetation Structure and Complexity	0.	78				
Function	nal Capacity	Indices			<u>.</u>			
Function 1	Support of Cl	Total naracteristic Wildlife Habitat			Functional			
V1 _{wetloss}	+ V2 _{barriers} +	Tunctional			Capacity Index			
0.70	+ 0.70 +]÷ 5	5 =	0.72			
Function 2	Support of Cl	naracteristic Fish/aquatic Habitat						
(3 x V4 _{source})	+ (2 x V5 _{dist}) +	2 x V6 _{outflow} + V8 _{chem} + V7 _{geom}						
2.19	+ 1.46 +	1.26 + 0.74 + 0.60 + = 6.25	÷ 9	9 =	0.69			
Function 3	Flood Attenu							
$V3_{buffer}$	+ (2 x V4 _{source} +	$(2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{geom} + V9_{veg}$	=					
0.65	+ 1.46 +	1.46 + 1.26 + 0.60 + 0.78 = 6.21	÷ 9	9 =	0.69			
		ong-term Water Storage						
V4 _{source}	+ (2 x V5 _{dist}) +		•					
0.73	+ 1.46 +	1.26 + 0.60 + + = 4.05]÷ 6	6 =	0.68			
Function 5	Nutrient/Toxi							
(2 x V5 _{dist})	+ V8 _{chem} +	V7 _{geom}	•		[1			
1.46	+ 0.74 +	0.60 + + + = 2.80] ÷ 4	4 =	0.70			
		ention/Shoreline Stabilization						
V3 _{buffer}	+ (2 x V7 _{geo}) +							
0.65	+ 1.20 +	1.56 + + = 3.41] ÷ 5	5 =	0.68			
		xport/Food Chain Support						
V1 _{wetloss}	+ 2 x V6 _{outflow} +	V8 _{chem} + V7 _{geo} + (2 x V9 _{veg})	4	:				
0.70	+ 1.26 +	0.74 + 0.60 + 1.56 + = 4.86] ÷ 7	7 =	0.69			

Composite FCI Score

Sum of Individual FCI Scores

÷ 7

ADMINISTRATIVE CHARACTERIZATION

General Informa	ation			12/18/20	12			
Site Name or ID:	Wetland 7 (M	arkham Arroy	0)	Project Name:	US 287 L	amar Bypass	:	
404 or Other Permit Application #:			Ар	plicant Name:	CDOT			
Evaluator Name(s):	Elly Weber	Elly Weber Evaluator's professional position and organization:					onmental	
Location Inform	nation:							
Site Location (Lat./Long. or UTM):	38.119473°, -1	02.609539°		Datum Used (NAD 83	NAD 83			
USGS Quadrangle Map:	Lamar East			Map Scale: (Circle one)	(1:24,000 Other	21:100,000 1:	
Sub basin Name (8 digit HUC):	(8 11020009 Wetland Ownership:				Private			
This evaluation is being performed at: (Check applicable box	x Project We		Purpose of Evaluation (check all applicable):	Potentially Imp Mitigation; Pro Mitigation; Pos Monitoring Other (Describ	e-construc st-constru	tion		
Intent of Project: (Cl	heck all applicable)		Restortation	☐ Enl	nancement		Creation	
Total Size of Wetlar (Record Area, Check and Measurement Method Us	d Describe	ac.	X Measured 0.20 Estimated	8				
Assessment Area (A		ac.	x Measured	ac. 0.208	ac.	ac.	ac.	
are used to record acreage AA is included in a single as	when more than one	ac.	Estimated	ac.	ac.	ac.	ac.	
Characteristics or M AA boundary detern		This AA is ald	ongside Markham	Arroyo.				
Notes: High	amount of stress	ors up and do	ownstream, functio	ning impaired v	wetland.			

ECOLOGICAL DESCRIPTION 1

Special Cor	ncerns	Check all that apply					
	s including Histosols or e AA (i.e., AA includes			Federally threa			d species are
	lirectly impact organic seas possessing either H	-					
	s are known to occur an vetland of which the AA			Species of con Heritage (CNH		•	e Colorado Natural ur in the AA?
The wetland urbanized la	is a habitat oasis in an ndscape?	otherwise dry or	х			•	I conservation area as determined by
	reatened or endangered AA? List Below.	species are KNOWN to		Other special of	oncerns (p	lease des	scribe)
	Н	YDROGEOMOR	PHI	C SETTIN	G		
AA wetland If the above	has been subject to ch	ntal natural hydrogeomonange in HGM classes and secribe the original wetlanglend setting.	is a re	sult of anthrop	ogenic mo		
Current Co	nditions	Describe the hydrogeor that apply.	morph	ic setting of the	e wetland i	by circling	g all conditions
	Water source	Surface flow	G	roundwater	Precipi	tation	Unknown
	Hydrodynamics	Unidirectional	_	Vertical	Bi-dired	ctional	
	Wetland Gradient	0 - 2%	$\langle \rangle$	2-4%	4-10%	>10	%
	# Surface Inlets	Over-bank	0		2	3	>3
HGM Setting	# Surface Outlets Geomorphic Setting (Narrative Description. Include approx. stream order for riverine) HGM class	This wetland is associa	0 ited wi	th Markham Ar	2 royo.	3 sional	>3 Lacustrine
Historical Co		TAVOINIO		Olopo	Боргоо	Sioi iai	Lacastins
HIStorical Col		Surface flow		roundwater	Drooini	tation	Linknown
	Water source Hydrodynamics	Surface flow Unidirectional	G	Vertical	Precipi	tation	Unknown
Previous wetland typology	Geomorphic Setting (Narrative Description)	Retains historical typolo	ogy.	vertical			
	Previous HGM Class	Riverine		Slope	Depres	sional	Lacustrine
Notes (include inf		- HGM subclass and region	onal su	ubclass):			

ECOLOGICAL DESCRIPTION 2

Syster	m	Su	bsyst	tem		Clas	S		Su	ıbcla	SS		'	Wate	er Re	gime)	Oth	ner M	/lodifi	ers	% /	AΑ
Riverin	ne	Pa	lustri	ine		EM		R	oote	d vas	scular				Υ							10	00
																				(2)			
Lacustrine Littoral; Limnora Palustrine Palustrine Lower perennial; Upper perennial; Intermittent			nial;	Unco Aqua Rock Unco Em	atic Be ky Sho on Sho nergent ub-scru	om(UB) ed(AB) re(RS) re(US) e(EM) eb(SS)	Algal, Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud;					Examples Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seasflood./sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y);					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);						
		Interm	ittent		For	rested	(FO)			Organic						Seas. (menan		Artif	ficial S		e(r);		
Site Ma	-	Interm	ittent		a ske	etch m	(FO) ap of the		C	Organic	:	portion	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	isses,	, an
	. =	Interm	ittent		a ske	etch m	ap of th		C	Organic	:	portion	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	asses,	an
cale: 1 sq.	. =	Interm	ittent		a ske	etch m	ap of th		C	Organic	:	portion	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	asses,	, aı
ale: 1 sq.	. =	Interm	ittent		a ske	etch m	ap of th		C	Organic	:	portion	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	asses,	, aı
ale: 1 sq.	. =	Interm	ittent		a ske	etch m	ap of th		C	Organic	:	portion	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	asses,	, a
cale: 1 sq.	. =	Interm	ittent		a ske	etch m	ap of th		C	Organic	:	oortion	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	esses,	, aı
ale: 1 sq.	. =	Interm	ittent		a ske	etch m	ap of th		C	Organic	:	portion	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	asses,	, ai
cale: 1 sq.	. =	Interm	ittent		a ske	etch m	ap of th		C	Organic	:	oortion	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	asses,	, ai
ale: 1 sq.	. =	Interm	ittent		a ske	etch m	ap of th		C	Organic	:	poortion	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	asses,	, ai
cale: 1 sq.	. =	Interm	ittent		a ske	etch m	ap of th		C	Organic	:	portion	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	asses,	, ai
cale: 1 sq.	. =	Interm	ittent		a ske	etch m	ap of th		C	Organic	:	portion	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	asses,	

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1 Score

0.7

Notes: Wetlands have been grazed downstream. Channelization and controlled flows have most likely decreased amount of historical wetlands in HCE.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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	Comments/description
		Major Highway	
barriers	Х	Secondary Highway	US 196
arri	Х	Tertiary Roadway	County Rd 8.5
		Railroad	
artificial		Bike Path	
-ţi		Urban Development	
li B	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
SOI		Fence	
Stressors	Х	Ditch or Aqueduct	Hyde Canal
₹		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	√	Stressors	Comments/description
		Industrial/commercial	
Se		Urban	
ng	Х	Residential	Farm House adjacent to site
Changes	Х	Rural	Residental lot at edge of buffer zone.
		Dryland Farming	
Use	Х	Intensive Agriculture	Plowed fields
and		Orchards or Nurseries	
_a		Livestock Grazing	
II	Х	Transportation Corridor	SH 196
ors		Urban Parklands	
SS		Dams/impoundments	
Stressors		Artificial Water body	
S		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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
×	Ditches or Drains (tile, etc.)	
	Dams	
×	Diversions	
×	Groundwater pumping	
×	Draw-downs	
	Culverts or Constrictions	
×	Point Source (urban, ind., ag.)	
×	Non-point Source	
×	Increased Drainage Area	
	Storm Drain/Urban Runoff	
	Impermeable Surface Runoff	
X	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
×	Actively Managed Hydrology	

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	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	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	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	Functioning Impaired	,	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	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.

Variable 4 Score

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	
×	Ditches	
	Ponding/Impoundment	
	Culverts	
×	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
×	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
×	Diversions	
	Sediment/Fill Accumulation	
Γ		

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	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	Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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	
×	Ditches	
	Dikes/Levees	
×	Road Grades	
×	Culverts	Culvert under Highway 196.
	Diversions	
	Constrictions	
×	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
×	Artificial Stream Banks	
	Weirs	
×	Confined Bridge Openings	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	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	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc	
		Grading	
×	=	Compaction	
×	eral	Plowing/Disking	
	en	Excessive Sedimentation	
	Q	Dumping	
×		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
×	nly	Excessive Bank Erosion	
×	ō	Channelization	
	SIÉ	Reconfigured Stream Channels	
×	au c	Artificial Banks/Shoreline	
	hannels	Beaver Dam Removal	
	ਹ	Substrate Embeddedness	
×		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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		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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

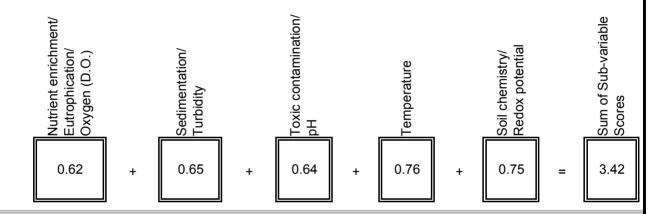
Stressor Category	Stressor Indicator	✓	Comments		Sub-
	Livestock	Х			variable
	Agricultural Runoff	Х		\Box \setminus	Score
Nutrient Enrichment/	Septic/Sewage				0.62
Eutrophication/	Excessive Algae or Aquatic Veg.				0.02
Oxygen (D.O.)	Cumulative Watershed NPS				
	CDPHE Impairment/TMDL List			\square	
	Excessive Erosion			\Box \	
	Excessive Deposition			_/_	
	Fine Sediment Plumes			」	
Sedimentation/	Agricultural Runoff	Х			0.65
	Excessive Turbidity				0.03
Turbidity	Nearby Construction Site				
	Cumulative Watershed NPS			_] /	
	CDPHE Impairment/TMDL List			\Box /	
				/	
	Recent Chemical Spills			\neg \	
	Nearby Industrial Sites			\neg \	
	Road Drainage/Runoff			\neg	
	Livestock	Х		\neg	
	Agricultural Runoff	Х		\neg	
Toxic contamination/	Storm Water Runoff				0.64
	Fish/Wildlife Impacts				0.04
рН	Vegetation Impacts			\Box /	
	Cumulative Watershed NPS				
	Acid Mine Drainage			\Box /	
	Point Source Discharge			\Box /	
	CDPHE Impairment/TMDL List			/	
	Metal staining on rocks and veg.			/	
	Excessive Temperature Regime				
	Lack of Shading	Х		\Box \setminus	
	Reservoir/Power Plant Discharge				0.76
Temperature	Industrial Discharge				0.70
	Cumulative Watershed NPS			_] /	
	CDPHE Impairment/TMDL List			_]/	
				/	
	Unnatural Saturation/Desaturation			\Box	
Soil chemistry/	Mechanical Soil Disturbance			_] [0.75
Redox potential	Dumping/introduced Soil				0.75
Neuda potential	CDPHE Impairment/TMDL List				·

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

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

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	\$	Scoring	oring Rules					
OCOIC	Olass	Single Factor		Composite Score					
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5					
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5					
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0					
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5					
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0					

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	\	/egetatio	n Layers		
Layers Scored (check boxes to right to indicate scored layers)					
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds					
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing			Х		
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization					
Dewatering			Х		
Over Saturation					
Percent Cover of Layer	0.00 +	0.00 +	80.00 +	X	= 80
Veg. Layer Sub-					See sub-variable scoring
variable Score			0.78		guidelines on following page
Turidista decre	<u>.</u>	<u> </u>			01.0
		<u> </u>			<u> </u>
Weighted Sub-variable Score	+	+	62.40 +		= 62.4
					Variable 9 Score

Sub-variable 9 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 Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 the 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 1: Habitat Connectivity - Neighboring Wetland Habitat Loss 0.70	VARIA	BLE SCORE	TABLE						
Variable 4: Water Source 0.62	& & xt	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0	.70				
Variable 4: Water Source 0.62	uffer Idsca ontex	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0	.78				
Variable 5: Water Distribution 0.70 0.68 Variable 6: Water Outflow 0.68 Variable 7: Geomorphology 0.60 0.78 Variable 8: Chemical Environment 0.78 Variable 9: Vegetation Structure and Complexity 0.78 Variable 9: Vegetation Structure and Complexity Variable 9: Variable 9: Vegetation Structure and Complexity Variable 9: Variabl	Br Lan	Variable 3:	Buffer Capacity	0	.65				
Variable 7: Geomorphology O.60	gy	Variable 4:	Water Source	0	.62				
Variable 7: Geomorphology O.60	drolo	Variable 5:	Water Distribution	0	.70				
	H	Variable 6:	Water Outflow	0	.68				
	and c at	Variable 7:	Geomorphology	0	.60				
	otic a 3iotic labita	Variable 8:	Chemical Environment	0.78					
	Abi F	Variable 9:	Vegetation Structure and Complexity	0.78					
	Function	nal Capacity	Indices						
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			Total				Functional		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			i dilctional						
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				ŀ	5	= [
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Function 2	Support of Cl	haracteristic Fish/aquatic Habitat	<u> </u>					
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			•	_		_			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	1.86	+ 1.40 +		÷	9	= [0.67		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Function 3	Flood Attenu	ation						
Function 4 Short- and Long-term Water Storage	$V3_{buffer}$	+ (2 x V4 _{source}) +	(2 x V5 _{dist}) + 2 x V6 _{outflow} + V7 _{geom} + V9 _{veg}	-		F			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	0.65	+ 1.24 +	1.40 + 1.36 + 0.60 + 0.78 = 6.03	÷	9	= [0.67		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			<u> </u>						
Function 5 Nutrient/Toxicant Removal $ (2 \times V5_{\text{dist}}) + V8_{\text{chem}} + V7_{\text{geom}} \\ 1.40 + 0.78 + 0.60 + + + + + + + + + + + + + + + + + + +$		1		Ī	_	F			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	0.62	+ 1.40 +	1.36 + 0.60 + = 3.98	<u> ÷ </u>	6	<u>= [</u>	0.66		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$									
Function 6 Sediment Retention/Shoreline Stabilization	1	1		I	_	F	0.70		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$				÷	4	<u>= [</u>	0.70		
0.65 + 1.20 + 1.56 + + + + + = 3.41 ÷ 5 = 0.68 Function 7 Production Export/Food Chain Support V1 _{wetloss} + 2 x V6 _{outflow} + V8 _{chem} + V7 _{geo} + (2 x V9 _{veg})									
Function 7 Production Export/Food Chain Support V1 _{wetloss} + 2 x V6 _{outflow} + V8 _{chem} + V7 _{geo} + (2 x V9 _{veg})				1.	_	_ [0.60		
$V1_{\text{wetloss}}$ + 2 x V6 _{outflow} + V8 _{chem} + V7 _{geo} + (2 x V9 _{veg})				<u> </u>	<u> </u>	<u>- L</u>	0.00		
		·							
		1		l÷	7	= [0.71		
	_			<u> </u>	_	<u> </u> 			

Sum of Individual FCI Scores

4.83

Divide by the Number of Functions Scored ÷ 7

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

General Infor	mation			Date of Evaluation:	12/18/201	12	
Site Name or ID:	Wetland 8 (Po Del Rio Ditch)	nds near Vis		Project Name:	US 287 L	amar Bypass	
404 or Other Peri Application #:	mit		Ар	oplicant Name:	CDOT		
Evaluator Name(Elly Webers):		ogist, Pinyon Environmental				
Location Info	rmation:						
Site Location (Lat./Long. or UTM):	38.116146°, -1	02.597429°		Datum Used (NAD 83	NAD 83		
USGS Quadrang Map:	le Lamar East			Map Scale: (Circle one)	(1:24,000 Other)1:100,000 1:
Sub basin Name digit HUC):	Wetland Ownership:				Private		
This evaluation is being performed (Check applicable)	x Project We		Purpose of Evaluation (check all applicable):	Potentially Imp Mitigation; Pre Mitigation; Pos Monitoring Other (Describ	e-construc st-construc	tion	
Intent of Project:	(Check all applicable)	[Restortation		nancement		Creation
Total Size of Wet (Record Area, Check Measurement Method	and Describe	ac.	x Measured .66 Estimated	1			
Assessment Area Area, check appropriate	. ,	20	x Measured	ac661	ac.	ac.	ac.
	age when more than one	ac.	Estimated	ac.	ac.	ac.	ac.
Characteristics of AA boundary dete	r Method used for ermination:		omprised of the frin Rio Ditch, and sou	-	urrounding	three ponds	to the north
Notes: PE	EM fringe wetlands,	fringes of thr	ee ponds.				

ECOLOGICAL DESCRIPTION 1

Special Cor	ncerns	Check all that apply				
	s including Histosols or le AA (i.e., AA includes				ened or endange o occur in the AA	ered species are \?
	directly impact organic s eas possessing either H					
	s are known to occur an wetland of which the AA			•	•	o the Colorado Natural occur in the AA?
The wetland urbanized la	is a habitat oasis in an ndscape?	otherwise dry or	Х		-	ntial conservation area ea as determined by
	reatened or endangered AA? List Below.	species are KNOWN to		Other special co	oncerns (please	describe)
<u> </u>						
	Н	YDROGEOMOR	PHI	C SETTING	3	
AA wetland If the above	has been subject to ch	ntal natural hydrogeomonange in HGM classes and escribe the original wetlangeland setting.	ıs a re	sult of anthropo	•	
Current Co	nditions	Describe the hydrogeor that apply.	morph	ic setting of the	wetland by circ	cling all conditions
	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
HGM Setting	# Surface Outlets		(0)) 1	2 3	>3
TOW Setting	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	Wetlands fringe wetlan Ditch.	ds sur	rounding a serie	es of ponds nor	th of Vista Del Rio
	HGM class	Riverine		Slope	Depressional	Lacustrine
Historical Co	nditions					
	Water source	Surface flow	\bigcirc	Groundwater	Precipitation	Unknown
Previous	Hydrodynamics	Unidirectional		Vertical		
wetland typology	Geomorphic Setting (Narrative Description)	Likely retains historical	typolo	ogy.		
	Previous HGM Class	Riverine		Slope	Depressional	Lacustrine
Notes (include in	formation on the AA's I	HGM subclass and regio	onal su	ubclass):		

ECOLOGICAL DESCRIPTION 2

System	Sul	osyst	em		Clas	S		Sι	ıbcla	SS			Wate	er Re	gime	;	Oth	ner M	/lodifi	ers	% /	AΑ
Lacustrine	L	ittora	al		EM		R	oote	d va	scula	r			Υ							10	00
acustrine Littoral; Limno Palustrine Palustrine Lower perennia Upper perennia Intermittent			Unco Aqu Rock Unco Em Shru	ck Bot. In Botto atic Be ky Shor on Shor nergent ub-scru rested	om(UB) d(AB) re(RS) re(US) (EM) b(SS)		Roote Algal; Non- oad-lea edle-lea Cobb Sa		cular; stent; tent; eciduou: vergree avel; id;		S Inte	empora Season Seas emi-Pe ermitte Artificia t./semi	turated ally flood./s flood./s erm. floo ntly ex ally floo perm./	oded(A); F); G); ; Y);	Mixos Acid(a Alka Orga Be Dra Dra	Eusal saline(sa); Circo line/ca nic(g); aver(bained/ca Farm ed/imp	aline(7) ine(8); 9); Fres umneu ilcareou ; Minera); Partia ditched(ied(f); oundec ubstrate	sh(0); tral(c); us(i); al(n); ally (d);			
																-()	Spoi	il(s); E	xcavate	ed(x)		
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Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1 Score

0.75

Notes: There are a number of wetlands within the HCE, both up gradient (across 196) and down gradient towards Vista Del Rio Ditch.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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.

	V	Stressors	Comments/description
		Major Highway	
barriers	Х	Secondary Highway	US 196
arri	Х	Tertiary Roadway	A handful of county roads
		Railroad	
cia		Bike Path	
artificial		Urban Development	
= a	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
SOI		Fence	
Stressors	Х	Ditch or Aqueduct	Hyde Canal
Stı		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	V	Stressors	Comments/description
		Industrial/commercial	
es		Urban	
ng		Residential	
Changes	Х	Rural	Residental lot at edge of buffer zone.
		Dryland Farming	
Use	Х	Intensive Agriculture	Plowed fields
and		Orchards or Nurseries	
ľa		Livestock Grazing	
II		Transportation Corridor	
Stressors		Urban Parklands	
SS		Dams/impoundments	
tre		Artificial Water body	
(V)		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines			
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.			
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.			
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.			
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.			

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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.

V	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
	Culverts or Constrictions	
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
	Storm Drain/Urban Runoff	
×	Impermeable Surface Runoff	US 196
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	
	_	

Variable Score	Condition Class	Depletion	Augmentation	
1.0 - 0.9	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	Unnatural drawdown events occasional, sh duration and/or mild; or uniform depletion u or mild to moderate reduction of peak flows 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 increas of peak flows or capacity of water to perform work.	
<0.8 - 0.7	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	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	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.	

Variable 4 Score

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	
	Ditches	
	Ponding/Impoundment	
	Culverts	
×	Road Grades	US 196
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	Functioning	Between 10 and 33% of the AA is affected by <i>in situ</i> 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	Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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.

V	Stressors	Comments/description
×	Alteration of Water Source	
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	
i		

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	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	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
		Dredging/Excavation/Mining	
×		Fill, including dikes, road grades, etc	US 196
		Grading	
	=	Compaction	
	eral	Plowing/Disking	
	en	Excessive Sedimentation	
	Ō	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
	nly	Excessive Bank Erosion	
	ō	Channelization	
	SIÉ	Reconfigured Stream Channels	
	Jue	Artificial Banks/Shoreline	
	Channels	Beaver Dam Removal	
		Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	F atiai	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

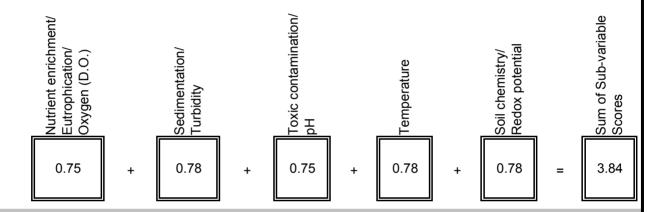
Stressor Category	Stressor Indicator	✓	Comments		Sub-
	Livestock	Х		\Box	variable
	Agricultural Runoff	Х		\Box \setminus	Score
Nutrient Enrichment/	Septic/Sewage				0.75
Eutrophication/	Excessive Algae or Aquatic Veg.				0.73
Oxygen (D.O.)	Cumulative Watershed NPS			\Box	
	CDPHE Impairment/TMDL List			/	
	Excessive Erosion			\Box \	
	Excessive Deposition			_/_	
	Fine Sediment Plumes			┙╵	
Sedimentation/	Agricultural Runoff	Х			0.78
Turbidity	Excessive Turbidity				0.76
rurblaity	Nearby Construction Site				
	Cumulative Watershed NPS			_] /	
	CDPHE Impairment/TMDL List			\Box /	
				/	
	Recent Chemical Spills			\neg	
	Nearby Industrial Sites			\neg \	
	Road Drainage/Runoff			\neg \	
	Livestock	Х		\neg	
	Agricultural Runoff	Х		\neg	
Toxic contamination/	Storm Water Runoff				0.75
	Fish/Wildlife Impacts				0.75
рН	Vegetation Impacts			\neg	
	Cumulative Watershed NPS			\Box /	
	Acid Mine Drainage			\Box /	
	Point Source Discharge			\Box /	
	CDPHE Impairment/TMDL List			\Box /	
	Metal staining on rocks and veg.				
	Excessive Temperature Regime			\Box	
	Lack of Shading	Х		$\neg \setminus$	
	Reservoir/Power Plant Discharge				0.78
Temperature	Industrial Discharge				0.76
	Cumulative Watershed NPS				
	CDPHE Impairment/TMDL List			\Box /	
				/	
	Unnatural Saturation/Desaturation			\Box	
Soil chemistry/	Mechanical Soil Disturbance				0.78
Redox potential	Dumping/introduced Soil				0.70
Neuox potential	CDPHE Impairment/TMDL List				
				\neg /	

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

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

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	\$	Rules	
Ocore	Olass	Single Factor		Composite Score
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

		Vegetatio	n Layers		
Layers Scored (check boxes to right to indicate scored layers)					
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds					
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization			Х		
Dewatering					
Over Saturation					
Percent Cover of Layer	0.00	0.00 +	1.00 +		= 1
	X		Х	X	
Veg. Layer Sub-					See sub-variable scoring
variable Score	0.6	0.6	0.78		guidelines on following page
Variable dedic					gandennies en ienen mig page
	II	II	II	II	-
Weighted Sub-variable Score	0.00	+ 0.00 +	0.78 +		= 0.78
					Variable 9 Score

Sub-variable 9 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 Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 the 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.

	,	<u> </u>	,						
VARIA	BLE SCORI	ETABLE							
& t t	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0.75						
Buffer & Landscape Context	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0.73						
Bı Lan C	Variable 3:	Buffer Capacity	0.75						
gy	Variable 4:	Water Source	0.70						
Hydrology	Variable 5:	Water Distribution	0.70						
Ŧ	Variable 6:	Water Outflow	0.70						
and S at	Variable 7:	Geomorphology	0.78						
Abiotic and Biotic Habitat	Variable 8:	Chemical Environment	0.78						
Abi E H	Variable 9:	Vegetation Structure and Complexity	0.78						
Function	Functional Capacity Indices								
Function 1	Support of C	haracteristic Wildlife Habitat Total Function							

Functional Capacity Indices	
Function 1 Support of Characteristic Wildlife Habitat	Total Functional Capacity
V1 _{wetloss} + V2 _{barriers} + V3 _{buffer} + (2 x V9 _{veg})	Points Index
0.75 + 0.73 + 0.75 + 1.56 +	+ 3 .79 ÷ 5 = 0.76
Function 2 Support of Characteristic Fish/aquatic Habitat	
$(3 \times V4_{source}) + (2 \times V5_{dist}) + 2 \times V6_{outflow} + V8_{chem} + V7_{geom}$	
2.10 + 1.40 + 1.40 + 0.78 + 0.78	+ 6.46 ÷ 9 = 0.72
Function 3 Flood Attenuation	
$V3_{\text{buffer}}$ + $(2 \times V4_{\text{source}} + (2 \times V5_{\text{dist}}) + (2 \times V6_{\text{outflow}} + V7_{\text{geom}})$	+ V9 _{veg}
0.75 + 1.40 + 1.40 + 1.40 + 0.78	+ 0.78 = 6.51 ÷ 9 = 0.72
Function 4 Short- and Long-term Water Storage	
V4 _{source} + (2 x V5 _{dist}) + 2 x V6 _{outflow}) V7 _{geom}	
0.70 + 1.40 + 1.40 + 0.78 +	+ 4 .28 ÷ 6 = 0.71
Function 5 Nutrient/Toxicant Removal	
(2 x V5 _{dist}) + V8 _{chem} + V7 _{geom}	
1.40 + 0.78 + 0.78 + +	+ 2 .96 ÷ 4 = 0.74
Function 6 Sediment Retention/Shoreline Stabilization	
$V3_{buffer}$ + $(2 \times V7_{geo})$ + $(2 \times V9_{veg})$	
0.75 + 1.56 + 1.56 + +	+ = 3.87 ÷ 5 = 0.77
Function 7 Production Export/Food Chain Support	
$V1_{\text{wetloss}}$ + 2 x V6 _{outflow} + $V8_{\text{chem}}$ + $V7_{\text{geo}}$ + (2 x V9 _{veg}	<u> </u>
0.75 + 1.40 + 0.78 + 0.78 + 1.56	+ 5 .27 ÷ 7 = 0.75

Sum of Individual FCI Scores

5.18

Divide by the Number of Functions Scored ÷ 7

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

General Inform	nation			Date of Evaluation:	12/19/20	12	
Site Name or ID:	Wetland 9 (Slo near Vista Del	•		Project Name:	US 287 L	amar Bypass	;
404 or Other Perm Application #:	nit		Αŗ	oplicant Name:	CDOT		
Evaluator Name(s	Elly Weber		Evaluator's profes:	sional position and organization:	Biologist,	Pinyon Envii	onmental
Location Infor	mation:						
Site Location (Lat./Long. or UTM):	38.115604°, -1	02.596661°		Datum Used (NAD 83	NAD 83		
USGS Quadrangle Map:	E Lamar East			Map Scale: (Circle one)	(1:24,000 Other)1:100,000 1:
Sub basin Name (a	⁸ 11020009			Wetland Ownership:	Private		
Project Inform	ation:		Х	Potentially Imp	pacted We	etlands	
This evaluation is being performed a (Check applicable b			Purpose of Evaluation (check all applicable):	Mitigation; Pre Mitigation; Pos Monitoring Other (Describ	st-constru		
Intent of Project: (Check all applicable)		Restortation	Enl	nancement		Creation
Total Size of Wetl (Record Area, Check a Measurement Method	and Describe	ac.	X Measured 1.80 Estimated	3			
Assessment Area Area, check appropriate b			x Measured	ac. 1.803	ac.	ac.	ac.
are used to record acreac AA is included in a single	ge when more than one	ac.	Estimated	ac.	ac.	ac.	ac.
Characteristics or AA boundary dete		This AA is a	slope wetland, bet	ween three por	nds and V	ista Del Rio [Ditch.
Notes: Slo	pe wetland, mostly	salt grass. I	Hydrology directly o	dependent on u	pgradient	ponds.	

ECOLOGICAL DESCRIPTION 1

Special Cor	ncerns	Check all that apply					
	s including Histosols or e AA (i.e., AA includes			Federally threa			d species are
	lirectly impact organic s eas possessing either H	-					
	s are known to occur an vetland of which the AA			Species of cor Heritage (CNH			e Colorado Natural ur in the AA?
urbanized la	·	otherwise dry or species are KNOWN to	×		currence bu	uffer area	al conservation area as determined by scribe)
	AA: LIST BOIOW.						
	Н	YDROGEOMOR	PHI	C SETTIN	G		
AA wetland If the above	has been subject to ch	ntal natural hydrogeomonange in HGM classes and secribe the original wetland setting.	as a re	sult of anthrop	ogenic mo		
Current Co	nditions	Describe the hydrogeo that apply.	morph	nic setting of th	e wetland	by circling	g all conditions
	Water source	Surface flow	(Groundwater	Precip	itation	Unknown
	Hydrodynamics	Unidirectional		Vertical	Bi-dire	ctional	
	Wetland Gradient	0 - 2%	6	2-4%	4-10%	>10	%
	# Surface Inlets	Over-bank	<u></u>) 1	2	3	>3
HGM Setting	# Surface Outlets		0) 1	2	3	>3
Trow details	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	Wetlands slope wetland Ditch downslope.	d, betv	ween a series	of ponds u	pslope ar	nd Vista Del Rio
	HGM class	Riverine		Slope	Depres	ssional	Lacustrine
Historical Co	nditions						
	Water source	Surface flow	\bigcirc	Groundwater	Precip	itation	Unknown
Draviava	Hydrodynamics	Unidirectional		Vertical			
Previous wetland typology	Geomorphic Setting (Narrative Description)	Likely retains historical	typolo	ogy.			
	Previous HGM Class	Riverine		Slope	Depres	ssional	Lacustrine
Notes (include inf	formation on the AA's I	HGM subclass and region	onal si	ubclass):			

ECOLOGICAL DESCRIPTION 2

System	n	Sul	bsyst	tem		Clas	S		Su	ıbcla	SS			Wate	er Re	gime)	Oth	ner M	1odifi	ers	% /	AΑ
Palustrine		Pa	Palustrine						oote	d va	scula	r			Υ							10	00
Littoral; Limnora alustrine Palustrine Lower perennial; Upper perennial; Intermittent			nial;	Unco Aqua Rock Unco Em	atic Be ky Shoi	om(UB) ed(AB) re(RS) re(US)	-	Roote Algal; Non- pad-lea edle-lea Cobb		cular; stent; tent; eciduou vergree avel;	- /	Examples Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seasflood./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)						
		Interm	ittent			rested	(FO)			Organio								Artif	icial S	ubstrat	e(r);		
Site Map	р	Interm	ittent		For	etch ma	(FO) ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, an
cale: 1 sq. :	p =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, ar
cale: 1 sq.	p =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio.	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, aı
cale: 1 sq. :	p =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, aı
ale: 1 sq. :	p =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, aı
cale: 1 sq. :	p =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, aı
ale: 1 sq. :	p =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, ai
cale: 1 sq. :	p =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, ai
ale: 1 sq. :	p =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, ai
cale: 1 sq.	p =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	. ai
	p =	Interm	ittent		For	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, a

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable	Condition	
Score	Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1 Score

0.75

Notes: There are neighboring wetlands with in the HCE, but many are most likely man made, not historical.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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.

	V	Stressors	Comments/description
		Major Highway	
barriers	Х	Secondary Highway	US 196
arri	Х	Tertiary Roadway	A handful of county roads
		Railroad	
cia		Bike Path	
artificial		Urban Development	
= a	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
SOI		Fence	
Stressors	Х	Ditch or Aqueduct	Hyde Canal
Stı		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	V	Stressors	Comments/description
		Industrial/commercial	
es		Urban	
ng		Residential	
Changes	Х	Rural	Residental lot at edge of buffer zone.
		Dryland Farming	
Use	Х	Intensive Agriculture	Plowed fields
and		Orchards or Nurseries	
ľa		Livestock Grazing	
II		Transportation Corridor	
Stressors		Urban Parklands	
SS		Dams/impoundments	
tre		Artificial Water body	
(V)		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines		
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.		
<0.9 - 0.8 Highly Functioning		Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.		
<0.8 - 0.7 Functioning		BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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 Functioning Impaired		Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.		
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.		

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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.

_	1	
\	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
	Culverts or Constrictions	
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
	Storm Drain/Urban Runoff	
×	Impermeable Surface Runoff	US 196
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Class	Depletion	Augmentation	
1.0 - 0.9	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	Highly or mild to moderate reduction of peak flows or		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	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	Functioning Impaired 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		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	Non-functioning Non-functioning Nater source diminished enough to threaten or extinguish wetland hydrology in the AA.		Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.	

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	
	Ditches	
	Ponding/Impoundment	
	Culverts	
×	Road Grades	US 196
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	Functioning	Between 10 and 33% of the AA is affected by <i>in situ</i> 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	Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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	
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Class	Scoring Guidelines	
1.0 - 0.9 Reference Standard		Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.	
<0.9 - 0.8 Highly Functioning		digh- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") evels flow continues essentially unaltered in quantity or character.	
<0.8 - 0.7	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.	
<0.7 - 0.6	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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
		Dredging/Excavation/Mining	
×		Fill, including dikes, road grades, etc	US 196
		Grading	
	=	Compaction	
	eral	Plowing/Disking	
	en	Excessive Sedimentation	
	Ō	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
	nly	Excessive Bank Erosion	
	ō	Channelization	
	SIÉ	Reconfigured Stream Channels	
	hannels	Artificial Banks/Shoreline	
	hai	Beaver Dam Removal	
	ਹ	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines		
1.0 - 0.9	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	8 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	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	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

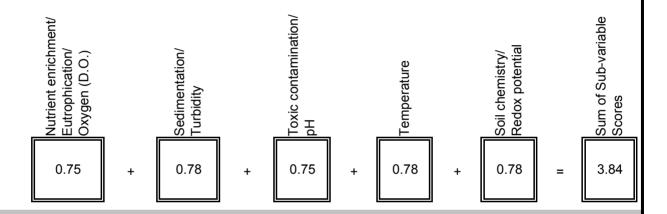
Stressor Category	Stressor Indicator	✓	Comments		Sub-
	Livestock	Х		\Box	variable
	Agricultural Runoff	Х		\Box \setminus	Score
Nutrient Enrichment/	Septic/Sewage				0.75
Eutrophication/	Excessive Algae or Aquatic Veg.				0.73
Oxygen (D.O.)	Cumulative Watershed NPS			\Box	
	CDPHE Impairment/TMDL List			/	
	Excessive Erosion			\Box \	
	Excessive Deposition			_/_	
	Fine Sediment Plumes			┙╵	
Sedimentation/	Agricultural Runoff	Х			0.78
Turbidity	Excessive Turbidity				0.76
rurblaity	Nearby Construction Site				
	Cumulative Watershed NPS			_] /	
	CDPHE Impairment/TMDL List			\Box /	
				/	
	Recent Chemical Spills			\neg	
	Nearby Industrial Sites			\neg \	
	Road Drainage/Runoff			\neg \	
	Livestock	Х		\neg	
	Agricultural Runoff	Х		\neg	
Toxic contamination/	Storm Water Runoff				0.75
	Fish/Wildlife Impacts				0.75
рН	Vegetation Impacts			\neg	
	Cumulative Watershed NPS			\Box /	
	Acid Mine Drainage			\Box /	
	Point Source Discharge			\Box /	
	CDPHE Impairment/TMDL List			\Box /	
	Metal staining on rocks and veg.				
	Excessive Temperature Regime			\Box	
	Lack of Shading	Х		$\neg \setminus$	
	Reservoir/Power Plant Discharge				0.78
Temperature	Industrial Discharge				0.76
	Cumulative Watershed NPS				
	CDPHE Impairment/TMDL List			\Box /	
				/	
	Unnatural Saturation/Desaturation			\Box	
Soil chemistry/	Mechanical Soil Disturbance				0.78
Redox potential	Dumping/introduced Soil				0.70
Neuox potential	CDPHE Impairment/TMDL List				
				\neg /	

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stress indicators not present or trivial.
Jiahly Typotioning		Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7 Functioning		Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
O 7 O 6 Functioning Impoired		Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	Non-functioning	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	Scoring Rules			
OCOIC	Olass	Single Factor		Composite Score	
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5	
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5	
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0	
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5	
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0	

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

		Vegetation Layers				rs		
Layers Scored (check boxes to right to indicate scored layers)								
Stressor	Tree		Shru	b	Herb	Α	quatic	Comments
Noxious Weeds								
Exotic/Invasive spp.								
Tree Harvest								
Brush Cutting/Shrub Removal								
Livestock Grazing								
Excessive Herbivory								
Mowing/Haying								
Herbicide								
Loss of Zonation/Homogenization					Х			
Dewatering								
Over Saturation								
Percent Cover of Layer	0.00	+	0.00	+	1.00	+		= 1
	Х		Х	-1	Х		Х	_
Veg. Layer Sub- variable Score	0.6		0.6		0.78			See sub-variable scoring guidelines on following page
	II	-	П	_	Ш	•	II	
Weighted Sub-variable Score	0.00	+	0.00	+	0.78	+		= 0.78
								Variable 9 Score

Sub-variable 9 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 Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 the 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.

	,	<u> </u>	,				
VARIA	BLE SCORI	ETABLE					
& t t	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss					
Buffer & Landscape Context	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers					
	Variable 3:	Buffer Capacity					
gy	Variable 4:	Water Source					
Hydrology	Variable 5:	Water Distribution					
Ŧ	Variable 6:	Water Outflow	0.70				
and S at	Variable 7:	Geomorphology					
Abiotic and Biotic And Abiotic	Variable 8:	Chemical Environment	0.78				
Variable 9		Vegetation Structure and Complexity					
Function	nal Capacity						
Function 1 Support of Characteristic Wildlife Habitat Total Functional							

Functional Capacity Indices		
Function 1 Support of Characteristic Wildlife Habitat	Total Functions Functional Capacity	
$V1_{\text{wetloss}}$ + $V2_{\text{barriers}}$ + $V3_{\text{buffer}}$ + $(2 \times V9_{\text{veg}})$	Points Index	
0.75 + 0.73 + 0.75 + 1.56 +	+ 3 .79 ÷ 5 = 0.76	
Function 2 Support of Characteristic Fish/aquatic Habitat		
$(3 \times V4_{source}) + (2 \times V5_{dist}) + 2 \times V6_{outflow} + V8_{chem} + V7_{geom}$		
2.10 + 1.40 + 1.40 + 0.78 + 0.78	+ = 6.46 ÷ 9 = 0.72	
Function 3 Flood Attenuation		
$V3_{\text{buffer}}$ + (2 x V4 _{source} + (2 x V5 _{dist}) + 2 x V6 _{outflow} + V7 _{geom}	+ V9 _{veg}	
	$+$ 0.78 = 6.51 \div 9 = 0.72	
Function 4 Short- and Long-term Water Storage		
V4 _{source} + (2 x V5 _{dist}) + 2 x V6 _{outflow}) V7 _{geom}		
0.70 + 1.40 + 0.78 +	+ = 4.28 ÷ 6 = 0.71	
Function 5 Nutrient/Toxicant Removal		
$(2 \times V5_{dist}) + V8_{chem} + V7_{geom}$		
	+ 2 .96 ÷ 4 = 0.74	
Function 6 Sediment Retention/Shoreline Stabilization		
$V3_{buffer}$ + $(2 \times V7_{geo})$ + $(2 \times V9_{veg})$		
	+ = 3.87 ÷ 5 = 0.77	
Function 7 Production Export/Food Chain Support		
$V1_{\text{wetloss}}$ + $2 \times V6_{\text{outflow}}$ + $V8_{\text{chem}}$ + $V7_{\text{geo}}$ + $(2 \times V9_{\text{veg}})$		
	+ 5 .27 ÷ 7 = 0.75	
		=

Sum of Individual FCI Scores

5.18

Divide by the Number of Functions Scored ÷ 7

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

General Information				12/19/2012					
Site Name or ID	· ·	Wetland 10 (Vista Del Rio Ditch)				US 287 Lamar Bypass			
404 or Other Pe Application #:	rmit	Ар				CDOT			
Evaluator Name	Elly Weber		Evaluator's profe	Biologist, Pinyon Environmental					
Location Info	ormation:								
Site Location (Lat./Long. or UTM):	38.11534°, -10	2.596179°		Datum Used (NAD 83	NAD 83				
				•					
USGS Quadrano Map:	gle Lamar East	Lamar East			(1:24,000 Other)1:100,000 1:		
Sub basin Name	11020009			Wetland Ownership:	Private				
Project Infor	mation:		Х	Potentially Imp	pacted We	etlands			
This evaluation i being performed (Check applicable	at: Mitigation S		Purpose of Evaluation (check all applicable):	Mitigation; Pre-construction Mitigation; Post-construction Monitoring Other (Describe)					
Intent of Project:	(Check all applicable)		Restortation	Enl	hancement		Creation		
Total Size of We (Record Area, Check Measurement Methodology)	k and Describe	ac.	X Measured .747 Estimated	,					
	ea (AA) Size (Record e box. Additional spaces		x Measured	ac747	ac.	ac.	ac.		
	eage when more than one	ac.	Estimated	ac.	ac.	ac.	ac.		
			his AA is a PEM wetland spanning the width of Vista Del Rio Ditch at this cation.						
Notes: A	A is "functioning."								

ECOLOGICAL DESCRIPTION 1

Special Cor	ncerns	Check all that apply					
	s including Histosols or e AA (i.e., AA includes			Federally threa			d species are
	lirectly impact organic s eas possessing either H	-					
	s are known to occur an wetland of which the AA			Species of con Heritage (CNH			e Colorado Natural ur in the AA?
urbanized la	The wetland is a habitat oasis in an otherwise dry or urbanized landscape? Federally threatened or endangered species are KNOWN to					ffer area a	I conservation area as determined by
	AA? List Below.			·	···		,
	Н	YDROGEOMOR	PHI	C SETTIN	G		
AA wetland	maintains its fundame	ntal natural hydrogeomo	orphic	characteristics			
x AA wetland	has been subject to ch	nange in HGM classes a escribe the original wetla	as a re	sult of anthrop	ogenic mod		
_	was created from an u	_			J		
Current Co	nditions	Describe the hydrogeo that apply.	morph	ic setting of the	e wetland b	y circling	g all conditions
	Water source	Surface flow	G	Groundwater	Precipit	tation	Unknown
	Hydrodynamics	Unidirectional		Vertical	Bi-direc	tional	
	Wetland Gradient	0 - 24	8	2-4%	4-10%	>10	%
	# Surface Inlets	Over-bank	0	1	2	3	>3
HGM Setting	# Surface Outlets		0	(1)	2	3	>3
	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	Wetland is a small frin	ge we	tland along Vis	ta Del Rio	Ditch.	
	HGM class	Riverine		Slope	Depress	sional	Lacustrine
Historical Co	nditions						
	Water source	Surface flow	G	Froundwater	Precipit	ation	Unknown
	Hydrodynamics	Unidirectional		Vertical			
Previous wetland typology	Geomorphic Setting (Narrative Description)	Wetland in a historical depressional or rivering		lain area; histo	rical typolo	gy may h	nave been
	Previous HGM Class	Riverine		Slope	Depress	sional	Lacustrine
Notes (include inf	formation on the AA's I	HGM subclass and region	onal su	ubclass):			

ECOLOGICAL DESCRIPTION 2

Syster	m	Su	bsyst	tem		Clas	S		Su	ıbcla	SS			Wate	er Re	gime)	Oth	ner M	1odifi	ers	% /	AΑ
Riverin	ne	Pa	llustri	ine		EM		R	oote	d va	scula	r			E							10	00
acustrine alustrine	Littoral; Limnoral Palustrine Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Lower perennial; Upper perennial; Upper perennial; Intermittent 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 Floating vascular; Rooted vascular; Rooted vascular; Algal; Persistent; Seasonally flooded(C) Seasflood./sat.(E); Semi-Perm. flooded(F) Intermittently exposed(C) Artificially flooded(K); Sat./semiperm./Seas. (\(\) Int. exposed/permenant); (); ();	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)																			
		Interm	ittent			rested	(FO)											Artif	icial S	ubstrat	e(r);		
Site Ma	-	Interm	ittent		For	etch m	(FO) ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	sses,	an
	. =	Interm	ittent		For	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	esses,	an
cale: 1 sq.	. =	Interm	ittent		For	etch m	ap of th		C	Organio	•	portio.	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	esses,	ar
cale: 1 sq.	. =	Interm	ittent		For	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	esses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	esses,	aı
ale: 1 sq.	. =	Interm	ittent		For	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	esses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	esses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	aal
cale: 1 sq.	. =	Interm	ittent		For	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	aı

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

	Condition	
Variable Score	Condition	Searing Guidelines
Score	Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1 Scor	E
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\sim	75
()	7.5

lotes: There are neighboring wetlands within the HCE.	

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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.

	V	Stressors	Comments/description
		Major Highway	
barriers	Х	Secondary Highway	US 196
arri	Х	Tertiary Roadway	A handful of county roads
		Railroad	
cia		Bike Path	
artificial		Urban Development	
= a	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
SOI		Fence	
Stressors	Х	Ditch or Aqueduct	Hyde Canal
Stı		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	V	Stressors	Comments/description
		Industrial/commercial	
es		Urban	
ng		Residential	
Changes	Х	Rural	Residental lot at edge of buffer zone.
		Dryland Farming	
Use	Х	Intensive Agriculture	Plowed fields
and		Orchards or Nurseries	
ľa		Livestock Grazing	
II		Transportation Corridor	
Stressors		Urban Parklands	
SS		Dams/impoundments	
tre		Artificial Water body	
(V)		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
	Culverts or Constrictions	
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
	Storm Drain/Urban Runoff	
×	Impermeable Surface Runoff	US 196
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
×	Actively Managed Hydrology	man-made canal with controlled flows

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	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	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	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	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	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.

Variable 4 Score

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	
	Ditches	
	Ponding/Impoundment	
	Culverts	
×	Road Grades	US 196
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine			
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	Functioning	Between 10 and 33% of the AA is affected by <i>in situ</i> 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	Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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.

V	Stressors	Comments/description
×	Alteration of Water Source	
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	
i		

Variable Score	Condition Class	Scoring Guidelines					
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.					
<0.9 - 0.8	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	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.					
<0.7 - 0.6	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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc	
		Grading	
	ral	Compaction	
	е	Plowing/Disking	
	Gen	Excessive Sedimentation	
	G	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
	nly	Excessive Bank Erosion	
×	Or	Channelization	
	els	Reconfigured Stream Channels	
×	nne	Artificial Banks/Shoreline	Man-made canal
	har	Beaver Dam Removal	
	C	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

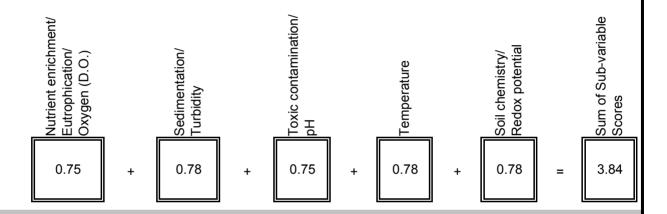
Stressor Category	Stressor Indicator	✓	Comments		Sub-
	Livestock	Х		\Box	variable
	Agricultural Runoff	Х		\Box \setminus	Score
Nutrient Enrichment/	Septic/Sewage				0.75
Eutrophication/	Excessive Algae or Aquatic Veg.				0.73
Oxygen (D.O.)	Cumulative Watershed NPS			\Box	
	CDPHE Impairment/TMDL List			/	
	Excessive Erosion			\Box \	
	Excessive Deposition			_/_	
	Fine Sediment Plumes			┙╵	
Sedimentation/	Agricultural Runoff	Х			0.78
Turbidity	Excessive Turbidity				0.76
rurblaity	Nearby Construction Site				
	Cumulative Watershed NPS			_] /	
	CDPHE Impairment/TMDL List			\Box /	
				/	
	Recent Chemical Spills			\neg \	
	Nearby Industrial Sites			\neg \	
	Road Drainage/Runoff			\neg \	
	Livestock	Х		\neg	
	Agricultural Runoff	Х		\neg	
Toxic contamination/	Storm Water Runoff				0.75
	Fish/Wildlife Impacts				0.75
рН	Vegetation Impacts			\neg	
	Cumulative Watershed NPS			\Box /	
	Acid Mine Drainage			\Box /	
	Point Source Discharge			\Box /	
	CDPHE Impairment/TMDL List			\Box /	
	Metal staining on rocks and veg.				
	Excessive Temperature Regime			\Box	
	Lack of Shading	Х		$\neg \setminus$	
	Reservoir/Power Plant Discharge				0.78
Temperature	Industrial Discharge				0.76
	Cumulative Watershed NPS				
	CDPHE Impairment/TMDL List			\Box /	
				/	
	Unnatural Saturation/Desaturation			\Box	
Soil chemistry/	Mechanical Soil Disturbance				0.78
Redox potential	Dumping/introduced Soil				0.70
Neuox potential	CDPHE Impairment/TMDL List				
				\neg /	

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

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

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	Scoring Rules						
OCOIC	Olass	Single Factor		Composite Score				
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5				
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5				
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0				
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5				
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0				

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

		\	/egeta	tio	n Laye	rs		
Layers Scored (check boxes to right to indicate scored layers)								
Stressor	Tree		Shru	b	Herb	A	quatic	Comments
Noxious Weeds								
Exotic/Invasive spp.								
Tree Harvest								
Brush Cutting/Shrub Removal								
Livestock Grazing								
Excessive Herbivory								
Mowing/Haying								
Herbicide								
Loss of Zonation/Homogenization					Х			
Dewatering								
Over Saturation								
Percent Cover of Layer	0.00	+	0.00	+	1.00	+		= 1
	X	1	Х		Х		X	
Veg. Layer Sub- variable Score	0.6		0.6		0.78			See sub-variable scoring guidelines on following page
	Ш		II		II		II	
Weighted Sub-variable Score	0.00	+	0.00	+	0.78	+		= 0.78
								Variable 9 Score

Sub-variable 9 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 Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 the 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.

VARIA	BLE SCORE	TABLE							
& xt xt	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0.7	ō					
Buffer & Landscape Context	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0.73	3					
Br Co	Variable 3:	Buffer Capacity	0.7	5					
gy	So Variable 4: Water Source								
Hydrology	Variable 5:	Water Distribution	0.70)					
Н	Variable 6:	Water Outflow	0.70)					
and c at	Variable 7:	Geomorphology	0.70)					
Abiotic and Biotic Habitat	Variable 8:	Chemical Environment	0.78	3					
Abi	Variable 9:	Vegetation Structure and Complexity	0.78	3					
Function	al Capacity	Indices							
Function 1	Support of Cl	Total haracteristic Wildlife Habitat Functional			Functional Capacity				
V1 _{wetloss}	+ V2 _{barriers} +		=	r	Index				
0.75	+ 0.73 +	0.75 + 1.56 + + = 3.79	÷ 5	=	0.76				
Function 2	Support of Cl	haracteristic Fish/aquatic Habitat							
(3 x V4 _{source})	+ (2 x V5 _{dist}) +		-	г					
2.10	+ 1.40 +	1.40 + 0.78 + 0.70 + = 6.38	÷ 9	=	0.71				
	Flood Attenu								
V3 _{buffer}		$(2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{geom} + V9_{veg}$	1 _	Г					
0.75	+ 1.40 +		÷ 9	=	0.71				
		ong-term Water Storage							
V4 _{source}	+ (2 x V5 _{dist}) +		1	_ [0.70				
0.70	+ 1.40 +	1.40 + 0.70 + = 4.20	÷ 6	_	0.70				
	Nutrient/Toxi + V8 _{chem} +								
1.40	+ 0.78 +	V7 _{geom}]÷ 4	=	0.72				
Function 6	Sediment Ref	tention/Shoreline Stabilization	<u>. </u>						
	+ (2 x V7 _{geo}) +			_					
0.75	+ 1.40 +]÷ 5	=	0.74				
		xport/Food Chain Support							
V1 _{wetloss}	+ 2 x V6 _{outflow} +		7	Г					
0.75	+ 1.40 +	0.78 + 0.70 + 1.56 + = 5.19	÷ 7	=	0.74				
		Sum of Individual ECI	Saaraa	. [5.08				

Sum of Individual FCI Scores

5.08

Divide by the Number of Functions Scored ÷ 7

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

General Informat	ion			Date of Evaluation:	12/19/20 ⁻	12	
Site Name or ID:	Wetland 11 (H	yde Canal)		Project Name:	US 287 L	amar Bypass	\$
404 or Other Permit Application #:			Aŗ	oplicant Name:	CDOT		
Evaluator Name(s):	Elly Weber		Evaluator's profess	sional position and organization:	Biologist,	Pinyon Envii	ronmental
Location Informa	ition:						
Site Location (Lat./Long. or UTM):	38.110785°, -1	02.596772°		Datum Used (NAD 83	NAD 83		
USGS Quadrangle Map:	Lamar East			Map Scale: (Circle one)	(1:24,000 Other)1:100,000 1:
Sub basin Name (8 digit HUC):	11020009			Wetland Ownership:	Private		
Project Information This evaluation is	on: x Project We	tland	Purpose of x Evaluation (check all	Potentially Imp Mitigation; Pre Mitigation; Pos	e-construc	etion	
being performed at: (Check applicable box)	Mitigation S	Site	applicable):	Monitoring Other (Describ	oe)		
Intent of Project: (Che	ck all applicable)		Restortation	Ent	hancement		Creation
Total Size of Wetland (Record Area, Check and D Measurement Method Used	Describe	ac.	× Measured .071 Estimated				
Assessment Area (AA		20	x Measured	ac071	ac.	ac.	ac.
are used to record acreage wh AA is included in a single asse		ac.	Estimated	ac.	ac.	ac.	ac.
Characteristics or Met AA boundary determir		This AA is a	a series of small fring	ge wetlands ale	ong both t	oanks of Hyd	e Canal.
Notes:							

ECOLOGICAL DESCRIPTION 1

Special Cor	ncerns	Check all that apply					
	s including Histosols or le AA (i.e., AA includes		Federally threa			d species are	
	lirectly impact organic s eas possessing either H						
	s are known to occur an wetland of which the AA			Species of con Heritage (CNH			e Colorado Natural ur in the AA?
urbanized la	·	otherwise dry or species are KNOWN to	X		urrence but	ffer area a	I conservation area as determined by
	AA? List Below.			·	, ,		,
	Н	YDROGEOMOR	PHI	C SETTIN	G		
AA wetland	maintains its fundame	ntal natural hydrogeomo	orphic	characteristics			
x AA wetland	has been subject to ch	nange in HGM classes a escribe the original wetla	s a re	sult of anthrop	ogenic mo		
	was created from an u	_	,		Ū		
Current Co	nditions	Describe the hydrogeon that apply.	morph	ic setting of the	e wetland k	oy circling	g all conditions
	Water source	Surface flow		roundwater	Precipit	tation	Unknown
	Hydrodynamics	Unidirectional		Vertical	Bi-direc	tional	
	Wetland Gradient	0 - 2%	Ş	2-4%	4-10%	>10	%
	# Surface Inlets	Over-bank	0	1	2	3	>3
HGM Setting	# Surface Outlets		0	(1)	2	3	>3
	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	Wetland is a small frin	ge we	tland along Vis	ta Del Rio	Ditch.	
	HGM class	Riverine		Slope	Depres	sional	Lacustrine
Historical Co	nditions						
	Water source	Surface flow	G	roundwater	Precipit	tation	Unknown
	Hydrodynamics	Unidirectional		Vertical			
Previous wetland typology	Geomorphic Setting (Narrative Description)	Wetland in a historical to depressional or riverine	-	podplain area; historical typology may have been		nave been	
	Previous HGM Class	Riverine		Slope	Depres	sional	Lacustrine
Notes (include int	formation on the AA's I	HGM subclass and region	onal su	ubclass):			

ECOLOGICAL DESCRIPTION 2

Syster	m	Su	bsyst	tem		Clas	S		Su	ıbcla	SS			Wate	er Re	gime)	Oth	ner M	1odifi	ers	% /	AΑ
Riverine		Palustrine		EM		Rooted vascular		r	E						100								
Littoral; Limno Palustrine Palustrine Lower perennial Upper perennial Intermittent			Unco Aqua Rock Unco Em	ck Bot. n Botto atic Be ky Shor on Shor nergent ub-scru	om(UB) d(AB) re(RS) re(US) (EM) b(SS)	Non-Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen;		- /	Examples Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seasflood./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)										
		Interm	ittent			rested	(FO)											Artif	icial S	ubstrat	e(r);		
Site Ma	-	Interm	ittent		For	etch ma	(FO) ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	sses,	an
	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	esses,	an
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio.	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	esses,	ar
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	esses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	esses,	aı
ale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	esses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	esses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	aal
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	aal

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

	Condition	
Variable Score	Condition	Searing Guidelines
Score	Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1 Score

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- (1	16	: 0
		רו

Notes: Wetland is in a historically upland setting. Few neighboring wetlands within the HCE.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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.

	V	Stressors	Comments/description
		Major Highway	
barriers		Secondary Highway	
arri		Tertiary Roadway	
		Railroad	
cia		Bike Path	
artificial		Urban Development	
n B	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
SOI		Fence	
Stressors		Ditch or Aqueduct	
Sţ		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 2 Score

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	√	Stressors	Comments/description
		Industrial/commercial	
es		Urban	
Changes		Residential	
ha	Х	Rural	Residental lot at edge of buffer zone.
		Dryland Farming	
Use	Х	Intensive Agriculture	Plowed fields
and		Orchards or Nurseries	
a		Livestock Grazing	
II		Transportation Corridor	
ors		Urban Parklands	
Stressors		Dams/impoundments	
tre		Artificial Water body	
(C)		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
	Culverts or Constrictions	
×	Point Source (urban, ind., ag.)	CAFOs in area
	Non-point Source	
	Increased Drainage Area	
	Storm Drain/Urban Runoff	
	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
×	Actively Managed Hydrology	Man-made canal with controlled flows

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	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	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	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	Functioning Impaired	,	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	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	Functioning	Between 10 and 33% of the AA is affected by <i>in situ</i> 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	Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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	
	Ditches	
	Dikes/Levees	
	Road Grades	
×	Culverts	Under US 196
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	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	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc	
		Grading	
	ral	Compaction	
	е	Plowing/Disking	
	Gen	Excessive Sedimentation	
	G	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
	nly	Excessive Bank Erosion	
×	Or	Channelization	
	els	Reconfigured Stream Channels	
×	nne	Artificial Banks/Shoreline	Man-made canal
	har	Beaver Dam Removal	
	C	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

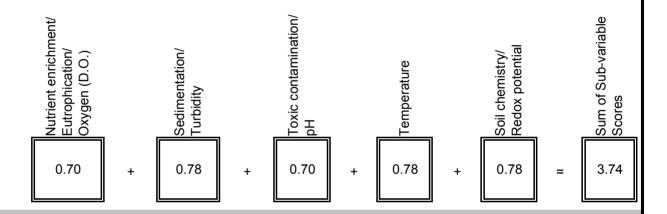
Stressor Category	Stressor Indicator	√	Comments		Sub-
	Livestock	Х			variable
	Agricultural Runoff	Х	CAFO in area	\neg	Score
Nutrient Enrichment/	Septic/Sewage				0.70
Eutrophication/	Excessive Algae or Aquatic Veg.				0.70
Oxygen (D.O.)	Cumulative Watershed NPS			\neg	
	CDPHE Impairment/TMDL List			\Box /	
				7	
	Excessive Erosion			\neg	
	Excessive Deposition			\neg	
	Fine Sediment Plumes			\neg	
0	Agricultural Runoff	Х			0.70
Sedimentation/	Excessive Turbidity				0.78
Turbidity	Nearby Construction Site			_ /	,
	Cumulative Watershed NPS			\neg /	
	CDPHE Impairment/TMDL List			-1/	
	·			 /	
	Recent Chemical Spills			\neg	
	Nearby Industrial Sites			─ \	
	Road Drainage/Runoff			\neg	
	Livestock	Х		\dashv \	
	Agricultural Runoff	Х	CAFO in area	_ \	
	Storm Water Runoff				
Toxic contamination/	Fish/Wildlife Impacts				0.70
рН	Vegetation Impacts			\neg)
	Cumulative Watershed NPS			\dashv /	
	Acid Mine Drainage			\dashv /	
	Point Source Discharge			-1/	
	CDPHE Impairment/TMDL List			/	
	Metal staining on rocks and veg.			_/	
	Excessive Temperature Regime			\neg	
	Lack of Shading	Х		\dashv /	
	Reservoir/Power Plant Discharge	1		— `	0 = 0
Temperature	Industrial Discharge	1			0.78
	Cumulative Watershed NPS	1		\dashv /	[
	CDPHE Impairment/TMDL List			\dashv	
		1		/ /	
	Unnatural Saturation/Desaturation				
6 11 1	Mechanical Soil Disturbance	1		\dashv $`$	0 = 0
Soil chemistry/	Dumping/introduced Soil				0.78
Redox potential	CDPHE Impairment/TMDL List			\dashv /	
	TELLING TO THE END	1		-1/	

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

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

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	\$	Scoring	oring Rules			
Ocore	Olass	Single Factor		Composite Score			
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5			
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5			
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0			
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5			
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0			

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

		Vegetatio	n Layers		
Layers Scored (check boxes to right to indicate scored layers)					
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds					
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization			Х		
Dewatering					
Over Saturation					
Percent Cover of Layer	0.00	0.00 +	1.00 +		= 1
	X		Х	X	
Veg. Layer Sub-					See sub-variable scoring
variable Score	0.6	0.6	0.78		guidelines on following page
Variable dedic					gandennies en ienen mig page
	II	II	II	II	-
Weighted Sub-variable Score	0.00	+ 0.00 +	0.78 +		= 0.78
					Variable 9 Score

Sub-variable 9 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 Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 the 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.

VARIA	BLE SCORE	TABLE		
& gbe	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0.68	
Buffer & Landscape Context	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0.83	
Bı Lan C	Variable 3:	Buffer Capacity	0.83	
ıgy	Variable 4:	Water Source	0.70	
Hydrology	Variable 5:	Water Distribution	0.70	
H	Variable 6:	Water Outflow	0.70	
and c at	Variable 7:	Geomorphology	0.70	
Abiotic and Biotic Habitat	Variable 8:	Chemical Environment	0.73	
Abi	Variable 9:	Vegetation Structure and Complexity	0.78	
Function	al Capacity	Indices		_
Function 1	Support of CI	Total naracteristic Wildlife Habitat		Functional
V1 _{wetloss}	+ V2 _{barriers} +	$V3_{\text{buffer}} + (2 \times V9_{\text{veq}})$ Functional Points		Capacity Index
0.68	+ 0.83 +	0.83 + 1.56 + + = 3.90	÷ 5 =	= 0.78
Function 2	Support of CI	naracteristic Fish/aquatic Habitat	-	
(3 x V4 _{source})	+ (2 x V5 _{dist}) +	2 x V6 _{outflow} + V8 _{chem} + V7 _{geom}	_	
2.10	+ 1.40 +	1.40 + 0.73 + 0.70 + = 6.33	÷ 9 =	= 0.70
Function 3	Flood Attenu	ation		
$V3_{buffer}$	+ (2 x V4 _{source}) +	$(2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{geom} + V9_{veg}$	_	
0.83	+ 1.40 +	1.40 + 1.40 + 0.70 + 0.78 = 6.51	÷ 9 =	= 0.72
Function 4	Short- and Lo	ong-term Water Storage		
V4 _{source}	+ (2 x V5 _{dist}) +	2 x V6 _{outflow}) V7 _{geom}	•	
0.70	+ 1.40 +	1.40 + 0.70 + + = 4.20	÷ 6 =	= 0.70
Function 5	Nutrient/Toxi			
	+ V8 _{chem} +	goom	1	
1.40	+ 0.73 +	0.70 + + + = 2.83	÷ 4 =	= 0.71
		tention/Shoreline Stabilization		
V3 _{buffer}	+ (2 x V7 _{geo}) +		ı _	
0.83	+ 1.40 +		÷ 5 =	= 0.76
		xport/Food Chain Support		
V1 _{wetloss}	+ (2 x V6 _{outflow} +		I	0.70
0.68	+ 1.40 +	0.73 + 0.70 + 1.56 + = 5.07	÷ 7 =	= 0.72
		Sum of Individual FCI	Scores	5.10

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

General Information				11/29/201	11/29/2012			
Site Name or ID:	Wetland 12	1		Project Name:	US 287 L	amar Bypass	;	
404 or Other Permit Application #:			Aŗ	oplicant Name:	CDOT			
Evaluator Name(s):	Elly Weber		Evaluator's profess	sional position and organization:	Biologist,	Biologist, Pinyon Environmental		
Location Informa	ition:							
Site Location (Lat./Long. or UTM):	38.108141459	9°, -102.594	84067°	Datum Used (NAD 83	NAD 83			
USGS Quadrangle Map:	Lamar East			Map Scale: (Circle one)	(1:24,000 Other)1:100,000 1:	
Sub basin Name (8 digit HUC):	11020009			Wetland Ownership:	Private			
Project Information	on:		х	Potentially Imp	pacted We	etlands		
This evaluation is being performed at: (Check applicable box)	x Project We Mitigation S		Purpose of Evaluation (check all applicable):	Mitigation; Pre Mitigation; Pos Monitoring Other (Describ	st-construc			
Intent of Project: (Che	ck all applicable)		Restortation	Ent	hancement		Creation	
Total Size of Wetland (Record Area, Check and D Measurement Method Used	Describe	ac.	x Measured 0.09 Estimated	8				
Assessment Area (AA			x Measured	ac. 0.098	ac.	ac.	ac.	
are used to record acreage wh AA is included in a single asse	nen more than one	ac.	Estimated	ac.	ac.	ac.	ac.	
Characteristics or Met AA boundary determir	nation:		a small depressiona The water source		• •			
Notes:								

ECOLOGICAL DESCRIPTION 1

Special Cor	ncerns	Check all that apply						
	s including Histosols or e AA (i.e., AA includes					atened or e to occur in		species are
	lirectly impact organic s eas possessing either H							
	s are known to occur ar vetland of which the AA							Colorado Natural ur in the AA?
urbanized la	The wetland is a habitat oasis in an otherwise dry or urbanized landscape? Federally threatened or endangered species are KNOWN to						uffer area a	conservation area as determined by cribe)
occur in the	AA? List Below.							
	Н	YDROGEOMOR	PHI	C SE	TTIN	G		
AA wetland If the above	has been subject to ch	ntal natural hydrogeomonange in HGM classes a escribe the original wetland	as a re	sult of	anthrop	ogenic mo		low.
AA welland	was created from an c	Describe the hydrogeo	mornh	ic setti	na of th	e wetland	hy circlino	all conditions
Current Co	nditions	that apply.	тогрг	no som	ng or tr	- wettaria	by circling	- un conditions
	Water source	Surface flow	G	Ground	water	Precip	itation	Unknown
	Hydrodynamics	Unidirectional		Vertic	cal	Bi-dire	ctional	
	Wetland Gradient	0 - 2%	6	2-4	%	4-10%	>109	%
	# Surface Inlets	Over-bank	0		<u>1</u>)	2	3	>3
HGM Setting	# Surface Outlets		0)	1	2	3	>3
	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	This wetland is within the pipe of an unknown sout depression with no outle	urce, p	•				
	HGM class	Riverine		Slop	ре	Depres	ssional	Lacustrine
Historical Co	nditions							
	Water source	Surface flow	G	Ground	water	Precip	itation	Unknown
5	Hydrodynamics	Unidirectional		Vertic	al	·		
Previous wetland typology	Geomorphic Setting (Narrative Description)	Within the Arkansas Ri	ver flo	odplair	ո. Wetla	ands likely	in this loca	ation, historically.
	Previous HGM Class	Riverine		Slop	ре	Depres	ssional	Lacustrine
Notes (include inf	formation on the AA's I	HGM subclass and region	onal si	ubclass	· ·	_	_	

ECOLOGICAL DESCRIPTION 2

System	n	Sul	bsyst	tem		Clas	S		Su	ıbcla	SS		,	Wate	er Re	gime	;	Oth	ner M	1odifi	ers	% /	ΑА
Palustrir	ne	Pa	lustri	ine		UB		R	oote	d va	scula	r			Е							10	00
																		Н	lvnersa	aline(7)			
acustrine Littoral; Limnor alustrine Palustrine Lower perennial; Intermittent		nial;	Unco Aqu Rock Unco Em	atic Be ky Shoi	om(UB) ed(AB) re(RS) re(US)	Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen;		- /	Examples Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seasflood./sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)); (); ();	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)										
		Interm	ittent			rested	(FO)											Artif	icial S	ubstrat	e(r);		
	р	Interm	ittent		Fo a ske	etch ma	(FO) ap of the		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial S il(s); E	ubstrat xcavate	e(r); ed(x)	isses,	an
cale: 1 sq.	p =	Interm	ittent		Fo a ske	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial S il(s); E	ubstrat xcavate	e(r); ed(x)	esses,	ar
cale: 1 sq.	p =	Interm	ittent		Fo a ske	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial S il(s); E	ubstrat xcavate	e(r); ed(x)	esses,	aı
cale: 1 sq. :	p =	Interm	ittent		Fo a ske	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial S il(s); E	ubstrat xcavate	e(r); ed(x)	esses,	a
ale: 1 sq. :	p =	Interm	ittent		Fo a ske	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial S il(s); E	ubstrat xcavate	e(r); ed(x)	esses,	a
ale: 1 sq. :	p =	Interm	ittent		Fo a ske	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial S il(s); E	ubstrat xcavate	e(r); ed(x)	esses,	a
ale: 1 sq. :	p =	Interm	ittent		Fo a ske	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial S il(s); E	ubstrat xcavate	e(r); ed(x)	esses,	а
ale: 1 sq. :	p =	Interm	ittent		Fo a ske	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial S il(s); E	ubstrat xcavate	e(r); ed(x)	esses,	a
ale: 1 sq. :	p =	Interm	ittent		Fo a ske	etch m	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial S il(s); E	ubstrat xcavate	e(r); ed(x)	asses,	a
cale: 1 sq.	p =	Interm	ittent		Fo a ske	etch m	ap of th		C	Organio	•	portion	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial S il(s); E	ubstrat xcavate	e(r); ed(x)	asses,	a
Site Map	p =	Interm	ittent		Fo a ske	etch m	ap of th		C	Organio	•	portion	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial S il(s); E	ubstrat xcavate	e(r); ed(x)	asses,	a

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1 Score

0.76

Notes: Herbicide application along the river to control salt cedar has killed the stands of willows. Evidence of remnant hydric soils. Could be due to lack of live vegetation or severe drought in the area.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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.

	V	Stressors	Comments/description
		Major Highway	
barriers		Secondary Highway	
arri		Tertiary Roadway	
		Railroad	
cia		Bike Path	
artificial		Urban Development	
= a	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
SOI	Х	Fence	Barbed-wire
Stressors	Х	Ditch or Aqueduct	Earthen ditch
St		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	✓	Stressors	Comments/description
		Industrial/commercial	
es		Urban	
пg		Residential	
Changes		Rural	
		Dryland Farming	
Use		Intensive Agriculture	
		Orchards or Nurseries	
Land	X	Livestock Grazing	Minor, on north side of Arkansas River only
П		Transportation Corridor	
ors		Urban Parklands	
SS		Dams/impoundments	
Stressors		Artificial Water body	
(O)		Physical Resource Extraction	
		Biological Resource Extraction	
	Х	Herbicide application	Vegetation along river banks dead due to herbicide application

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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.

V	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
	Culverts or Constrictions	
×	Point Source (urban, ind., ag.)	Water source from a pipe, ultimate source unknown
	Non-point Source	
	Increased Drainage Area	
	Storm Drain/Urban Runoff	
	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	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	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	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	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	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.

Variable 4 Score

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine			
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	Functioning	Between 10 and 33% of the AA is affected by <i>in situ</i> 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	Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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	
	Ditches	
	Dikes/Levees	
×	Road Grades	Small farm road
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	
×	No outlet	

Variable Condition Class		Scoring Guidelines					
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA wate outflow regime.					
<0.9 - 0.8 Highly Functioning		High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") evels flow continues essentially unaltered in quantity or character.					
<0.8 - 0.7 Functioning		High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.					
<0.7 - 0.6	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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
	Dredging/Excavation/Mining	
	Fill, including dikes, road grades, etc	
	Grading	
=	Compaction	
eral	Plowing/Disking	
en	Excessive Sedimentation	
Ō	Dumping	
	Hoof Shear/Pugging	
	Aggregate or Mineral Mining	
	Sand Accumulation	
	Channel Instability/Over Widening	
nly	Excessive Bank Erosion	
ō	Channelization	
SIÉ	Reconfigured Stream Channels	
hannels	Artificial Banks/Shoreline	
hai	Beaver Dam Removal	
ਹ	Substrate Embeddedness	
	Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	Franctic miner	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

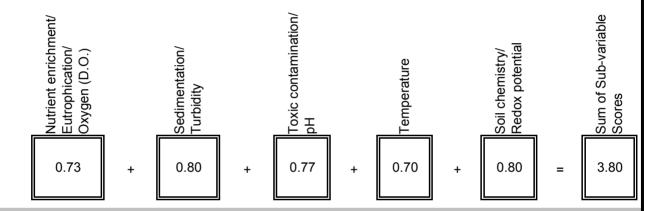
Stressor Category	Stressor Indicator	V	Comments		Sub-
	Livestock	Х	CAFOs in area		variable
Nutrient Enrichment/	Agricultural Runoff	Х		\neg	Score
	Septic/Sewage				0.73
Eutrophication/	Excessive Algae or Aquatic Veg.				0.73
Oxygen (D.O.)	Cumulative Watershed NPS				
	CDPHE Impairment/TMDL List	Х	Fecal coliforms	\Box /	
	Excessive Erosion				
	Excessive Deposition			\Box	
	Fine Sediment Plumes				
Sedimentation/	Agricultural Runoff				0.80
Turbidity	Excessive Turbidity				0.80
ruiblally	Nearby Construction Site				
	Cumulative Watershed NPS			/	
	CDPHE Impairment/TMDL List				
	Recent Chemical Spills			$ \frown \setminus$	
	Nearby Industrial Sites			\Box \	
	Road Drainage/Runoff				
	Livestock	Х	CAFOs in area	\Box	
	Agricultural Runoff			'	
Toxic contamination/	Storm Water Runoff				0.77
pH	Fish/Wildlife Impacts				0.77
ριι	Vegetation Impacts				
	Cumulative Watershed NPS				
	Acid Mine Drainage			\Box /	
	Point Source Discharge			\square /	
	CDPHE Impairment/TMDL List			/	
	Metal staining on rocks and veg.				
	Excessive Temperature Regime				
	Lack of Shading	Х			
	Reservoir/Power Plant Discharge				0.70
Temperature	Industrial Discharge				0.70
	Cumulative Watershed NPS				
	CDPHE Impairment/TMDL List			/	
	Unnatural Saturation/Desaturation			\Box	
Soil chemistry/	Mechanical Soil Disturbance				0.80
Redox potential	Dumping/introduced Soil				0.00
redux potential	CDPHE Impairment/TMDL List				
	-				

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

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

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition	Scoring Rules				
Score	Class	Single Factor		Composite Score		
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5		
<0.9 - 0.8	.8 Highly Functioning Any single factor scores ≥ 0.8 but		or	The factor scores sum >4.0 but ≤4.5		
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0		
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5		
< 0.6 Non- functioning		Any single factor scores < 0.6	or	The factor scores sum < 3.0		

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	,	Vegetatio	n Layers	3	
Layers Scored (check boxes to right to indicate scored layers)					
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds					
Exotic/Invasive spp.			Х		Common reed on CO nox weed watch list
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization			Х		
Dewatering					
Over Saturation					
Percent Cover of Layer	0.00 +	0.00 +	1.00 +	-	= 1
			X	X	
Vog Lavor Sub		$\widehat{}$			Can sub variable convinu
Veg. Layer Sub- variable Score	0.6	0.6	0.6		See sub-variable scoring guidelines on following page
variable Score					guidelines on following page
	II	II	II	II	
Weighted Sub-variable	0.00	0.00	0.00		- 0.0
Score	0.00 +	0.00 +	0.60 +		= 0.6
				-	
					Variable 9 Score 0.60
					Variable 9 Score

Sub-variable 9 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 Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 the 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.

VARIA	BLE SCORE	TABLE				
& ape	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0).76		
Buffer & Landscape Context	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0	08.0		
Br Co	Variable 3:	Buffer Capacity	0	08.0		
gy	Variable 4:	Water Source	0	.70		
Hydrology	Variable 5:	Water Distribution	0.70			
Н	Variable 6:	Water Outflow	0	.67		
and c at	Variable 7:	Geomorphology	0	.70		
Abiotic and Biotic Habitat	Variable 8:	Chemical Environment	0).75		
Abi	Variable 9:	Vegetation Structure and Complexity	0	0.60		
Function	al Capacity	Indices				
Function 1	Support of Cl	Total naracteristic Wildlife Habitat Functional				Functional
V1 _{wetloss}	+ V2 _{barriers} +	$V3_{\text{buffer}} + (2 \times V9_{\text{veg}})$ Functional Points				Capacity Index
0.76	+ 0.80 +		÷	5	= [0.71
Function 2	Support of CI	naracteristic Fish/aquatic Habitat			_	
(3 x V4 _{source})	+ (2 x V5 _{dist}) +	2 x V6 _{outflow} + V8 _{chem} + V7 _{geom}			F	1
2.10	+ 1.40 +	1.34 + 0.75 + 0.70 + = 6.29	÷	9	= [0.70
	Flood Attenu					
V3 _{buffer}		$(2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{geom} + V9_{veg}$	1		F	
0.80	+ 1.40 +	1.40 + 1.34 + 0.70 + 0.60 = 6.24	÷	9	= [0.69
		ong-term Water Storage				
V4 _{source}	+ (2 x V5 _{dist}) +		1 .	_	Īī	0.00
0.70	+ 1.40 +		÷	6	= [0.69
	Nutrient/Toxi					
	+ V8 _{chem} +	goom	1.	4	_ [ī	0.71
1.40	+ 0.75 +		÷	4	= [0.71
V3 _{buffer}	Sediment Ret + (2 x V7 _{geo}) +	tention/Shoreline Stabilization				
0.80	+ 1.40 +		ŀ	5	= [0.68
Function 7	Production E	xport/Food Chain Support			<u>_</u>	
V1 _{wetloss}	+ 2 x V6 _{outflow} +	•	_		_	
0.76	+ 1.34 +	0.75 + 0.70 + 1.20 + = 4.75	÷	7	=	0.68
					Ī	

Sum of Individual FCI Scores

4.87

Divide by the Number of Functions Scored ÷ 7

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

General Informat	ion			Date of Evaluation:	11/29/201	12	
Site Name or ID:	Wetland 13 (A	rkansas Rive	er V	Project Name:	US 287 L	amar Bypass	,
404 or Other Permit Application #:			Ąŗ	oplicant Name:	CDOT		
Evaluator Name(s):	Elly Weber		Evaluator's profess	sional position and organization:	Biologist,	Pinyon Envir	onmental
Location Informa	ition:						
Site Location (Lat./Long. or UTM):	38.106474561	9°, -102.594	743306°	Datum Used (NAD 83	NAD 83		
USGS Quadrangle Map:	Lamar East			Map Scale: (Circle one)		1:24,000 Other	1:100,000 1:
Sub basin Name (8 digit HUC):	11020009			Wetland Ownership:	Private		
Project Information	on:		Х	Potentially Imp	pacted We	etlands	
This evaluation is being performed at: (Check applicable box)	x Project We Mitigation S		Purpose of Evaluation (check all applicable):	Mitigation; Pre Mitigation; Pos Monitoring Other (Describ	st-construc		
Intent of Project: (Che	ck all applicable)		Restortation	Ent	hancement		Creation
Total Size of Wetland (Record Area, Check and D Measurement Method Used	Describe	ac.	X Measured 0.31 Estimated				
Assessment Area (AA Area, check appropriate box. A			x Measured	ac. 0.31	ac.	ac.	ac.
are used to record acreage wh AA is included in a single asse	nen more than one	ac.	Estimated	ac.	ac.	ac.	ac.
Characteristics or Met AA boundary determir			s defined by all the hydrologically conn				
Notes:							

ECOLOGICAL DESCRIPTION 1

Special Cor	ncerns	Check all that apply					
	s including Histosols or le AA (i.e., AA includes		Federally threa			d species are	
	lirectly impact organic s eas possessing either H	-					
	s are known to occur an wetland of which the AA			Species of cor Heritage (CNH			e Colorado Natural ur in the AA?
urbanized la	reatened or endangered	otherwise dry or species are KNOWN to			urrence bu	ffer area a	I conservation area as determined by scribe)
occur in the	AA? List Below.						
					-		
_	Н	YDROGEOMOR	PHI	C SETTIN	G		
AA wetland	has been subject to ch	ntal natural hydrogeomo nange in HGM classes a escribe the original wetla	as a re	sult of anthrop	ogenic mo		
AA wetland	was created from an u	pland setting.					
Current Co	nditions	Describe the hydrogeol that apply.	morph	ic setting of th	e wetland i	by circling	g all conditions
	Water source	Surface flow	G	roundwater	Precipi	tation	Unknown
	Hydrodynamics	Unidirectional		Vertical	Bi-dired	tional	
	Wetland Gradient	0 - 2%	$\langle \rangle$	2-4%	4-10%	>10	%
	# Surface Inlets	Over-bank	0	1	2	3	>3
HGM Setting	# Surface Outlets		0	1	2	3	>3
Trown octung	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	The Arkansas River ret a natural braided chanr agriculture.					
	HGM class	Riverine		Slope	Depres	sional	Lacustrine
Historical Co	nditions						
	Water source	Surface flow	G	roundwater	Precipi	tation	Unknown
	Hydrodynamics	Unidirectional		Vertical			
Previous wetland typology	Geomorphic Setting (Narrative Description)	The wetlands retain the	eir hist	orical wetland	typology.		
	Previous HGM Class	Riverine		Slope	Depres	sional	Lacustrine
Notes (include int	formation on the AA's I	HGM subclass and region	onal su	ubclass):			

ECOLOGICAL DESCRIPTION 2

Syster	m	Su	bsyst	tem		Clas	S		Su	ıbcla	SS		1	Wate	er Re	aime)	Oth	ner M	1odifi	iers	% /	AΑ
Riverin		Į	Jppe erenn	r		UB		R			scula	r			E	<u> </u>							00
		ρ·																					
acustrine alustrine		Littora Palust		mnoral	Unco Aqu	atic Be	m(UB) d(AB)		Roote Algal;	ng vas ed vaso ; Persis	cular; stent;		S	empor Sa Season	xample arily flo turated ally floo	oded(A (B); oded(C);	Mixos Acid(a Alka	line/ca	ine(8); 9); Fres umneu Icareo	sh(0); itral(c); us(i);		
Riverine		Rocky Shore(RS Uncon Shore(US Unper perennial; Upper perennial; Intermittent Rocky Shore(RS Uncon Shore(US Emergent(EM) Shrub-scrub(SS Forested (FO)		re(US) (EM)	Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud; Organic			Seasflood./sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y); Int. exposed/permenant(Z)			Organic(g); Mineral(n); Beaver(b); Partially Drained/ditched(d); Farmed(f); Diked/impounded(h); Artificial Substrate(r); Spoil(s); Excavated(x)		ally (d);										
		Interm	ittent			rested	(FO)											Artif	icial S	ubstrat	e(r);		
		Interm	ittent		For	etch ma	(FO) ap of th		C	Organio	•	portio	Int.	expos	ed/peri	menan	t(Z)	Artif Spoi	ficial Suil(s); Ex	ubstrat ccavate	e(r); ed(x)	asses,	an
Site Ma	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/peri	menan	t(Z)	Artif Spoi	ficial Suil(s); Ex	ubstrat ccavate	e(r); ed(x)	3SS&S,	an
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/peri	menan	t(Z)	Artif Spoi	ficial Suil(s); Ex	ubstrat ccavate	e(r); ed(x)	asses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/peri	menan	t(Z)	Artif Spoi	ficial Suil(s); Ex	ubstrat ccavate	e(r); ed(x)	asses,	ar
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/peri	menan	t(Z)	Artif Spoi	ficial Suil(s); Ex	ubstrat ccavate	e(r); ed(x)	asses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/peri	menan	t(Z)	Artif Spoi	ficial Suil(s); Ex	ubstrat ccavate	e(r); ed(x)	asses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/peri	menan	t(Z)	Artif Spoi	ficial Suil(s); Ex	ubstrat ccavate	e(r); ed(x)	asses,	ar
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/peri	menan	t(Z)	Artif Spoi	ficial Suil(s); Ex	ubstrat ccavate	e(r); ed(x)	asses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/peri	menan	t(Z)	Artif Spoi	ficial Suil(s); Ex	ubstrat ccavate	e(r); ed(x)	asses,	aı
cale: 1 sq.	. =	Interm	ittent		For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/peri	menan	t(Z)	Artif Spoi	ficial Suil(s); Ex	ubstrat ccavate	e(r); ed(x)	asses,	aı

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

	Condition	
Variable Score	Condition	Searing Guidelines
Score	Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1 Score

0.76

Notes: Herbicide application along the river to control salt cedar has killed the stands of willows. Evidence of remnant hydric soils. Could be due to lack of live vegetation or severe drought in the area.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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.

	V	Stressors	Comments/description
		Major Highway	
barriers		Secondary Highway	
arri		Tertiary Roadway	
		Railroad	
cia		Bike Path	
artificial		Urban Development	
= a	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
SOI	Х	Fence	Barbed-wire
Stressors	Х	Ditch or Aqueduct	Earthen ditch
St		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	√	Stressors	Comments/description
		Industrial/commercial	
es		Urban	
ng		Residential	
Changes		Rural	
		Dryland Farming	
Use		Intensive Agriculture	
and l		Orchards or Nurseries	
-a	Х	Livestock Grazing	Minor, on north side of Arkansas River only
II		Transportation Corridor	
ors		Urban Parklands	
SS		Dams/impoundments	
Stressors		Artificial Water body	
S		Physical Resource Extraction	
		Biological Resource Extraction	
	Х	Herbicide application	Vegetation along river banks dead due to herbicide application

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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
×	Ditches or Drains (tile, etc.)	Many ditches in vicinity- including Lamar Canal
×	Dams	At Lamar Canal
	Diversions	
	Groundwater pumping	
	Draw-downs	
	Culverts or Constrictions	
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
×	Storm Drain/Urban Runoff	Town of Lamar
	Impermeable Surface Runoff	
×	Irrigation Return Flows	
×	Mining/Natural Gas Extraction	Gravel pit
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	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	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	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	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	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.

Variable 4 Score

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	Functioning	Between 10 and 33% of the AA is affected by <i>in situ</i> 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	Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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.

Variable Score	Condition Class	Scoring Guidelines				
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.				
<0.9 - 0.8	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 Functioning		High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.				
<0.7 - 0.6 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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
	Dredging/Excavation/Mining	
	Fill, including dikes, road grades, etc	
	Grading	
=	Compaction	
eral	Plowing/Disking	
en	Excessive Sedimentation	
Ō	Dumping	
	Hoof Shear/Pugging	
	Aggregate or Mineral Mining	
	Sand Accumulation	
	Channel Instability/Over Widening	
nly	Excessive Bank Erosion	
o	Channelization	
SIÉ	Reconfigured Stream Channels	
υι	Artificial Banks/Shoreline	
hannels	Beaver Dam Removal	
ਹ	Substrate Embeddedness	
	Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	Franctic miner	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

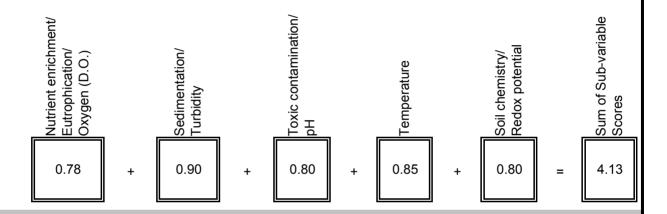
Stressor Category	Stressor Indicator	V	Comments		Sub-
	Livestock	Х	CAFOs in area	\neg	variable
	Agricultural Runoff	Х		\Box \setminus	Score
Nutrient Enrichment/	Septic/Sewage				0.78
Eutrophication/	Excessive Algae or Aquatic Veg.				0.70
Oxygen (D.O.)	Cumulative Watershed NPS			/	
	CDPHE Impairment/TMDL List	Х	Fecal coliforms	_//	
				_	
	Excessive Erosion			_/\	
	Excessive Deposition			 	
	Fine Sediment Plumes			- \-	
Sedimentation/	Agricultural Runoff				0.90
Sedimentation/ Turbidity	Excessive Turbidity			<u> </u>	0.00
ransianty	Nearby Construction Site			_ / /	
	Cumulative Watershed NPS			_ /	
	CDPHE Impairment/TMDL List			_//	
				_/	
	Recent Chemical Spills			_\	
	Nearby Industrial Sites			 \	
	Road Drainage/Runoff			 \	
	Livestock	Х	CAFOs in area	→ \	
	Agricultural Runoff			 \ -	
Toxic contamination/	Storm Water Runoff				0.80
рН	Fish/Wildlife Impacts			<u> </u>	0.00
μ	Vegetation Impacts			_ / /	
	Cumulative Watershed NPS			_	
	Acid Mine Drainage			 / -	
	Point Source Discharge			⊣ /	
	CDPHE Impairment/TMDL List			_//	
	Metal staining on rocks and veg.			_(
	Excessive Temperature Regime			-/\	
	Lack of Shading	Х		┤	
- ,	Reservoir/Power Plant Discharge			_	0.85
Temperature	Industrial Discharge			┩┡	
	Cumulative Watershed NPS			\dashv /	
	CDPHE Impairment/TMDL List			 /	
	Unnatural Saturation/Desaturation			-【	
				\dashv	 1
Soil chemistry/	Mechanical Soil Disturbance			∥	0.80
Redox potential	Dumping/introduced Soil			┦╚	
,	CDPHE Impairment/TMDL List	-		-	

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

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

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	Scoring Rules						
OCOIC	Olass	Single Factor		Composite Score				
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5				
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5				
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0				
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5				
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0				

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	\	/egetatio	n Layers		
Layers Scored (check boxes to right to indicate scored layers)					
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds		Х			Salt Cedar- noxious weed
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide		Х			
Loss of Zonation/Homogenization	Х	Х	Х		
Dewatering					
Over Saturation					
Percent Cover of Layer	0.10 +	0.40 +	1.00 +	X	1.5
Veg. Layer Sub- variable Score	0.6	0.6	0.73		See sub-variable scoring guidelines on following page
	"	"	"		
Weighted Sub-variable Score	0.06 +	0.24 +	0.73 +		= 1.03
					Variable 9 Score

Sub-variable 9 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 Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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

VARIABLE SCORE TABLE

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 the 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.

VARIA	BLE SCORE	IABLE		
& xt xt	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0.76]
Buffer & Landscape Context	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0.88]
Br Co	Variable 3:	Buffer Capacity	0.88]
gy	Variable 4:	Water Source	0.90]
Hydrology	Variable 5:	Water Distribution	0.90	
H	Variable 6:	Water Outflow	0.88]
and S	Variable 7:	Geomorphology	0.90]
Abiotic and Biotic Habitat	Variable 8:	Chemical Environment	0.83]
Abia E H	Variable 9:	Vegetation Structure and Complexity	0.69]
Eupotion	al Capacity	Indiana		_
runction	al Capacity	Total		Functional
Function 1	Support of Cl	naracteristic Wildlife Habitat Functional		Capacity
V1 _{wetloss}	+ V2 _{barriers} +	V3 _{buffer} + (2 x V9 _{veg}) Points	_	Index
0.76	+ 0.88 +	0.88 + 1.37 + + = 3.89	÷ 5 =	0.78
Function 2	Support of CI	naracteristic Fish/aquatic Habitat		
(3 x V4 _{source})	+ (2 x V5 _{dist}) +	2 x V6 _{outflow} + V8 _{chem} + V7 _{geom}		
2.70	+ 1.80 +		÷ 9 =	0.89
Function 3	Flood Attenu	ation	<u> </u>	
V3 _{buffer}	+(2 x V4 _{source} +	$(2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{geom} + V9_{veg}$	_	
0.88	+ 1.80 +		÷ 9 =	0.87
Function 4	Short- and Lo	ong-term Water Storage	-	
V4 _{source}	+ (2 x V5 _{dist}) +			
0.90	+ 1.80 +	1.76 + 0.90 + + = 5.36	÷ 6 =	0.89
Function 5	Nutrient/Toxi	cant Removal		
(2 x V5 _{dist})	+ V8 _{chem} +	V7 _{geom}		
1.80	+ 0.83 +		÷ 4 =	0.88
Function 6	Sediment Ret	ention/Shoreline Stabilization	-	
V3 _{buffer}	+ (2 x V7 _{geo}) +	(2 x V9 _{veq})		
0.88	+ 1.80 +	1.37 + + + + = 4.05	÷ 5 =	0.81
Function 7	Production E	xport/Food Chain Support	-	
V1 _{wetloss}	+ [2 x V6 _{outflow} +	V8 _{chem} + V7 _{geo} + (2 x V9 _{veg})		
0.76	+ 1.76 +		÷ 7 =	0.80
		Sum of Individual FCI	Scores	5.93

÷ 7

0.85

Divide by the Number of Functions Scored

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

General Infor	mation	Date of Evaluation:				11/30/2012		
Site Name or ID:	Wetland 14 (W	/illow Creek))	Project Name:	US 287 L	_amar Bypass	3	
404 or Other Peri Application #:	mit		Аŗ	CDOT oplicant Name:				
Evaluator Name(Elly Weber		Evaluator's profess	sional position and organization:	Biologist	, Pinyon Envi	ronmental	
Location Info	rmation:							
Site Location (Lat./Long. or UTM):	38.091148006	6°, -102.579	711165°	Datum Used (NAD 83	NAD 83			
USGS Quadrang Map:	e Lamar East			Map Scale: (Circle one)		1:24,000 Other	>1:100,000 1:	
Sub basin Name digit HUC):	(8 11020009			Wetland Ownership:	Private			
This evaluation is being performed (Check applicable)	x Project We		D	Potentially Imp Mitigation; Pre Mitigation; Pos Monitoring Other (Describ	e-construc st-constru	etion		
Intent of Project:	(Check all applicable)		Restortation	Enl	nancemen	t 🔲	Creation	
Total Size of Wet (Record Area, Check Measurement Method	and Describe	ac.	Measured .19 Estimated					
Assessment Area Area, check appropriate		ac.	Measured	ac19	ac.	ac.	ac.	
are used to record acrea AA is included in a single	O	ao.	Estimated	ac.	ac.	ac.	ac.	
Characteristics or AA boundary dete		This AA is a	series of fringe sh	rub-scrub wetl	ands alon	g Willow Cre	ek.	
Notes: W	etlands created fron	n historically	upland setting.					

ECOLOGICAL DESCRIPTION 1

Spe	ecial Cor	ncerns	Check all that apply						
		s including Histosols or e AA (i.e., AA includes o			Federally threa		•	d species are	
	-	lirectly impact organic seas possessing either H	-						
		s are known to occur an vetland of which the AA			Species of con Heritage (CNH			e Colorado Natural ur in the AA?	
	The wetland is a habitat oasis in an otherwise dry or urbanized landscape?						•	conservation area as determined by	
	•	eatened or endangered AA? List Below.	species are KNOWN to		Other special o	oncerns (p	lease des	cribe)	
	HYDROGEOMORPHIC SETTING								
	AA wetland If the above	has been subject to ch	ntal natural hydrogeomo nange in HGM classes a scribe the original wetla pland setting.	s a re	sult of anthrop	ogenic mo		low.	
Cur	rent Coi	nditions	Describe the hydrogeon that apply.	morph	ic setting of the	e wetland l	by circling	all conditions	
		Water source	Surface flow	G	Froundwater	Precipi	tation	Unknown	
		Hydrodynamics	Unidirectional		Vertical	Bi-dired	tional		
		Wetland Gradient	0 - 2%	<u>6</u>	2-4%	4-10%	>10	%	
		# Surface Inlets	Over-bank	0	$\frac{1}{2}$	2	3	>3	
HGM	Setting	# Surface Outlets Geomorphic Setting (Narrative Description. Include approx. stream order for riverine) HGM class	This wetland is a series	0 s of frir	nge wetlands a	2 long Willow		>3 Lacustrine	
11:-4	:I C		Triverine		Оюрс	Бергез	Sioriai	Lacustinie	
піѕ	orical Co		Curfo oo floor		roundwater	Dra ele:	tation	Linknown	
		Water source Hydrodynamics	Surface flow Unidirectional	<u>.</u>	Froundwater Vertical	Precipi	เสแบท	Unknown	
	revious nd typology	Geomorphic Setting (Narrative Description)	Officirectional		vertical				
		Previous HGM Class	Riverine		Slope	Depres	sional	Lacustrine	
Notes	s (include inf	ormation on the AA's I	HGM subclass and region	onal su	ubclass):	_	_		

ECOLOGICAL DESCRIPTION 2

Syster	m	Su	bsyst	tem		Clas	S		Su	ıbcla	SS			Wate	er Re	gime	;	Oth	ner M	/lodifi	ers	% /	AΑ
Riverir	ne	Pa	lustri	ine		SS		R	oote	d va	scula	r			Е							10	00
Lacustrine Palustrine Riverine		Littoral; Limnoral Palustrine Lower perennial; Upper perennial; Intermittent		Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) al; Emergent(EM)		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); Seasflood./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)												
		Interm	ittent		Fo	rested	(FO)											Artif	icial S	ubstrat	e(r);		
Site Ma	_	Interm	ittent		a ske	etch ma	(FO) ap of the		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	isses,	an
	. =	Interm	ittent		a ske	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	esses,	ar
cale: 1 sq.	. =	Interm	ittent		a ske	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	esses,	aı
ale: 1 sq.	. =	Interm	ittent		a ske	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	esses,	a
ale: 1 sq.	. =	Interm	ittent		a ske	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	esses,	a
ale: 1 sq.	. =	Interm	ittent		a ske	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	esses,	a
ale: 1 sq.	. =	Interm	ittent		a ske	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	esses,	a
ale: 1 sq.	. =	Interm	ittent		a ske	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	esses,	a
ale: 1 sq.	. =	Interm	ittent		a ske	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	asses,	a
cale: 1 sq.	. =	Interm	ittent		a ske	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	asses,	a
cale: 1 sq.	. =	Interm	ittent		a ske	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrate xcavate	e(r); ed(x)	asses,	

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1 Score

0.63

Notes: Neighboring wetlands are very few/small within the HCE (other than other wetlands along Willow Creek).

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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.

	V	Stressors	Comments/description
40		Major Highway	
barriers	Х	Secondary Highway	US 50
arri	Х	Tertiary Roadway	Several county roads
	Х	Railroad	
cia		Bike Path	
artificial		Urban Development	
li B	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
SOI	Х	Fence	
Stressors	Х	Ditch or Aqueduct	
ξŢ		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 2 Score

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	√	Stressors	Comments/description
		Industrial/commercial	
es		Urban	
ng		Residential	
Changes	Х	Rural	
		Dryland Farming	
Use	Х	Intensive Agriculture	Feed lots nearby, plowed fields
and		Orchards or Nurseries	
Lar	Х	Livestock Grazing	Minor, on north side of Arkansas River only
II		Transportation Corridor	
ors		Urban Parklands	
SS		Dams/impoundments	
Stressors		Artificial Water body	
S		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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
	Ditches or Drains (tile, etc.)	
×	Dams	
×	Diversions	Creek appears to have been diverted to flow east rather than north into Rive
	Groundwater pumping	
	Draw-downs	
×	Culverts or Constrictions	Creek has been channelized in town and to the east of town.
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
×	Storm Drain/Urban Runoff	Town of Lamar
	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Class	Depletion	Augmentation
1.0 - 0.9	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	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	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	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	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.

Variable 4 Score

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	!
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
×	Hardened/Engineered Channel	Engineered channel
	Enlarged Channel	
×	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	Functioning	Between 10 and 33% of the AA is affected by <i>in situ</i> 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	Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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	
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
×	Hardened/Engineered Channel	Engineered channel
	Artificial Stream Banks	
	Weirs	
×	Confined Bridge Openings	Many in study area

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	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	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc	
		Grading	
	<u>=</u>	Compaction	
	eneral	Plowing/Disking	
	jen	Excessive Sedimentation	
	Ō	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
	nly	Excessive Bank Erosion	
	ō	Channelization	
×	SI	Reconfigured Stream Channels	
×	٦	Artificial Banks/Shoreline	
	Channels	Beaver Dam Removal	
		Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	F atiai	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

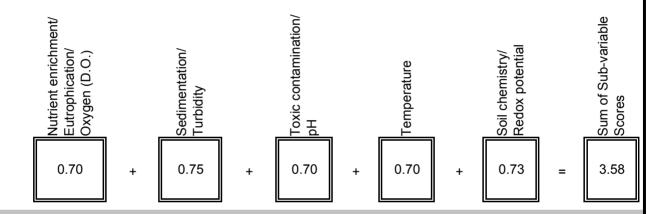
Stressor Category	Stressor Indicator	V	Comments		Sub-
	Livestock	Х	CAFOs in area		variable
	Agricultural Runoff	Х		\neg	Score
Nutrient Enrichment/	Septic/Sewage				0.70
Eutrophication/	Excessive Algae or Aquatic Veg.	Х			0.70
Oxygen (D.O.)	Cumulative Watershed NPS				
	CDPHE Impairment/TMDL List	Х	Fecal coliforms	\Box /	
	Excessive Erosion			 (
	Excessive Deposition Fine Sediment Plumes			-	
		.,		─	
Sedimentation/	Agricultural Runoff	Х			0.75
Turbidity	Excessive Turbidity			—	
-	Nearby Construction Site			-	
	Cumulative Watershed NPS			-	
	CDPHE Impairment/TMDL List			— /	
				— (
	Recent Chemical Spills			 \	
	Nearby Industrial Sites			─ ─ \	
	Road Drainage/Runoff	Х	0.450	─ \	
	Livestock	X	CAFOs in area	\	
	Agricultural Runoff	Х		— \	
Toxic contamination/	Storm Water Runoff	Х	Town of Lamar		0.70
рН	Fish/Wildlife Impacts				
•	Vegetation Impacts			— /	
	Cumulative Watershed NPS			— /	
	Acid Mine Drainage			— /	
	Point Source Discharge			— //	
	CDPHE Impairment/TMDL List			/	
	Metal staining on rocks and veg.				
	Excessive Temperature Regime			_/\	
	Lack of Shading	Х		─	
	Reservoir/Power Plant Discharge				0.70
Temperature	Industrial Discharge				
	Cumulative Watershed NPS			/	
	CDPHE Impairment/TMDL List			— /	
	Unnatural Saturation/Desaturation			一/_	
Cail aboreistand	Mechanical Soil Disturbance			─ 	0.70
Soil chemistry/	Dumping/introduced Soil	Х			0.73
Redox potential	CDPHE Impairment/TMDL List			\Box /	

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

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

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	Scoring Rules				
Ocore		Single Factor		Composite Score		
1.0 - 0.9	Reference Standard	No single factor scores < 0.9		The factor scores sum > 4.5		
<0.9 - 0.8	Highly Functioning	Any single factor scores > 11 x hilt < 11 y		The factor scores sum >4.0 but ≤4.5		
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0		
<0.7 - 0.6	<0.7 - 0.6 Functioning Impaired Any single factor scores ≥ 0.6 but <0.7		or	The factor scores sum >3.0 but ≤3.5		
< 0.6	Non- functioning Any single factor scores < 0.6		or	The factor scores sum < 3.0		

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	Vegetation Layers				
Layers Scored (check boxes to right to indicate scored layers)					
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds					
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization		Х	Х		
Dewatering					
Over Saturation					
Percent Cover of Layer	0.00 +		1.00 +		= 1.4
	Х	X	Х	Х	<u> </u>
Veg. Layer Sub-	0.6	0.78	0.78		See sub-variable scoring
variable Score	0.0	0.70	0.70		guidelines on following page
	II	II	II	II	
Weighted Sub-variable Score	0.00 +	0.31 +	0.78 +		= 1.092
					Variable 9 Score 0.78

Sub-variable 9 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 Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 the 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.

VARIA	BLE SCORE	TABLE			_
x ape	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0.6	3	
Buffer & Landscape Context	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0.6	35	
Br C	Variable 3:	Buffer Capacity	0.6	3	
ıgy	Variable 4:	Water Source	0.6	3	
Hydrology	Variable 5:	Water Distribution	0.6	3	
Η	Variable 6:	Water Outflow	0.6	3	
and c at	Variable 7:	Geomorphology	0.6	30	
Abiotic and Biotic Habitat	Variable 8:	Chemical Environment	0.7	'5	
Abi	Variable 9:	Vegetation Structure and Complexity	0.7	'8	
Function	al Capacity	Indices			-
		Total			Functional
V1 _{wetloss}	+ V2 _{barriers} +	$V3_{\text{buffer}} + (2 \times V9_{\text{veg}})$ Functional Points			Capacity Index
0.63	+ 0.65 +		÷ 5	; =	0.69
Function 2	Support of Cl	naracteristic Fish/aquatic Habitat			
	+ (2 x V5 _{dist}) +	-	-		
1.89	+ 1.26 +	1.26 + 0.75 + 0.60 + = 5.76	÷ 9) =	0.64
Function 3	Flood Attenu				
V3 _{buffer}		$(2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{geom} + V9_{veg}$	I		
0.63	+ 1.26 +	1.26 + 1.26 + 0.60 + 0.78 = 5.79	÷ 9	=	0.64
		ng-term Water Storage			
V4 _{source}	+ (2 x V5 _{dist}) +		م . ا		0.00
0.63	+ 1.26 +	1.26 + 0.60 + = 3.75	÷ 6	, =	0.63
	Nutrient/Toxi				
(2 x V5 _{dist}) 1.26	+ V8 _{chem} + + 0.75 +	V7 _{geom} 0.60 + + + 2.61	÷ 4	L =	0.65
			- 4		0.00
	+ (2 x V7 _{geo)} +	ention/Shoreline Stabilization			
V3 _{buffer} 0.63	+ 1.20 +	1.56 + + + = 3.39	÷ 5	; = [']	0.68
	Production E	xport/Food Chain Support			<u> </u>
V1 _{wetloss}	+ [2 x V6 _{outflow} +	$V8_{chem}$ + $V7_{geo}$ + $(2 \times V9_{veg})$	_		
0.63	+ 1.26 +	0.75 + 0.60 + 1.56 + = 4.80	÷ 7	' =	0.69
		Sum of Individual FCI	Score	es	4.62

÷ 7

0.66

Divide by the Number of Functions Scored

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

General Infor	mation			Date of Evaluation:	11/30/20	12	
Site Name or ID:	Wetland 15 (W	/illow Creek)		Project Name:	US 287 Lamar Bypass		
404 or Other Per Application #:	mit		Aį	Applicant Name:			
Evaluator Name(Elly Webers):		Evaluator's profes	sional position and organization:	Biologist,	Pinyon Envii	⁻ onmental
Location Info	rmation:						
Site Location (Lat./Long. or UTM):	38.091148006	6°, -102.579	711165°	Datum Used (NAD 83	NAD 83		
USGS Quadrang Map:	le Lamar East			Map Scale: (Circle one)	(1:24,000 Other)1:100,000 1:
Sub basin Name digit HUC):	(8 11020009			Wetland Ownership:	Private		
Project Information is being performed (Check applicable	x Project We		Purpose of Evaluation (check all applicable):	Mitigation; Pre Mitigation; Pos Monitoring	e-construc st-construc	tion	
	(Check all applicable)	[Restortation	Other (Describ	nancement		Creation
Total Size of We (Record Area, Check Measurement Method	and Describe	ac.	Measured 2.47 Estimated				
	A (AA) Size (Record box. Additional spaces	20	Measured	ac. 2.47	ac.	ac.	ac.
are used to record acrea AA is included in a singl	age when more than one e assessment)	ac.	Estimated	ac.	ac.	ac.	ac.
Characteristics o AA boundary det	r Method used for ermination:	This AA is a	series of fringe we	etlands along W	illow Cree	èk.	
Notes: Th	nese PEM wetlands	are created f	rom a historically u	ipland setting.			

ECOLOGICAL DESCRIPTION 1

Special Cor	ncerns	Check all that apply					
	s including Histosols or e AA (i.e., AA includes			Federally threa			d species are
	lirectly impact organic s eas possessing either H	-					
	s are known to occur an wetland of which the AA			Species of con Heritage (CNH			e Colorado Natural ur in the AA?
urbanized la	·	otherwise dry or species are KNOWN to			urrence bu	ffer area a	I conservation area as determined by
	AA? List Below.						
	Н	YDROGEOMOR	PHI	C SETTIN	G		
AA wetland If the above	has been subject to ch	ntal natural hydrogeomonange in HGM classes a escribe the original wetland	as a re	sult of anthrop	ogenic mo		·low.
AA Welland	was created from an o	Describe the hydrogeo	mornh	ic setting of the	e wetland h	ov circline	all conditions
Current Co	nditions	that apply.					
	Water source	Surface flow	G	roundwater	Precipi	tation	Unknown
	Hydrodynamics	Unidirectional		Vertical	Bi-direc	tional	
	Wetland Gradient	0 - 2%	⟨ >	2-4%	4-10%	>10	%
	# Surface Inlets	Over-bank	0	(1)	2	3	>3
HGM Setting	# Surface Outlets		0	(1)	2	3	>3
Ü	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	This wetland is a series	s of frin	nge wetlands a	long Willov	w Creek.	
	HGM class	Riverine		Slope	Depres	sional	Lacustrine
Historical Co	nditions						
	Water source	Surface flow	G	roundwater	Precipit	tation	Unknown
	Hydrodynamics	Unidirectional		Vertical			
Previous wetland typology	Geomorphic Setting (Narrative Description)						
	Previous HGM Class	Riverine		Slope	Depres	sional	Lacustrine
Notes (include int	formation on the AA's I	HGM subclass and region	onal su	ubclass):			

ECOLOGICAL DESCRIPTION 2

Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Lower perennial; Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Lower perennial; Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Lower perennial; Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Needle-leaved deciduous; Needle-leaved evergreen; Rock Bot. (RB) Temporarily flooded(A); Saturated(B); Seasflood./sat.(E); Semi-Perm. flooded(F); Beaver(b); Partially Intermittently exposed(G); Drained/ditched(d);		0.0			Oth	,	giirie	r Re	vale			00	ubcla			<u> </u>	Clas		LCIII	bsyst	Sui	111	Syste	3
Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Lower perennial; Upper perennial; Intermittent Divermittent Draw a sketch map of the site including relevant portions of the wetland, AA boundary, structures, habitat calculate a calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, AA boundary, structures, habitat calcular and the site including relevant portions of the wetland, and the site including relevant portions of the wetland, and the site including relevant portions of the wetland, and the site includin	100							E			ar	scula	ed va	Roote	F		UB		ine	lustri	Ра	ne	iverir	R
Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Intermittent Draw a sketch map of the site including relevant portions of the wetland, AA boundary, structures, habitat classes. Examples Temporarily flooded(A); Saturated(B); Seasonally flooded(A); Seas-flood./sat.(E); Seasonally flooded(C); Seas-flood./sat.(E); Seas-flood./																								
Rock Bot. (RB) Uncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Uncon Shore(US) Emergent(EM) Shrub-scrub(SS) Intermittent Draw a sketch map of the site including relevant portions of the wetland, AA boundary, structures, habitat classes. Examples Temporarily flooded(A); Saturated(B); Seasonally flooded(A); Seas-flood./sat.(E); Seasonally flooded(C); Seas-flood./sat.(E); Seas-flood./	_																							
other significant features.		sh(0); utral(c); us(i); ral(n); ally (d); d(h); te(r);	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);		G); G); (Y);	Temporarily flooded(A); Saturated(B); Seasonally flooded(C); Seasflood./sat.(E); Semi-Perm. flooded(F); Intermittently exposed(G); Artificially flooded(K); Sat./semiperm./Seas. (Y);		Rooted vascular; Algal; Persistent; Non-Persistent; Broad-leaved deciduous; Needle-leaved evergreen; Cobble - gravel; Sand; Mud;			om(UB) d(AB) re(RS) re(US) (EM) b(SS)	Palustrine Rock Bot. (I Uncon Botton Aquatic Bed Rocky Shore Uncon Shore Emergent(E Shrub-scrub			Lacustrine Palustrine Riverine									
see Figure 2	isses, a	oitat cla	ıs, hab	ucture	ry, stri	ounda	AA bo	tland,	ne we	ns of t	portio	levant	ling re	inclua								_		
																						ıre 2	Figu	ee
	$\overline{}$																							

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

	Condition	
Variable Score	Condition	Searing Guidelines
Score	Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1 Score

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Notes: Low amount of neighboring wetlands within the HCE (other than other Willow Creek wetlands).

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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.

	V	Stressors	Comments/description
		Major Highway	
barriers	Х	Secondary Highway	US 50
arri	Х	Tertiary Roadway	Several county roads
	Х	Railroad	
cia		Bike Path	
artificial		Urban Development	
li B	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
SOI	Х	Fence	
Stressors	Х	Ditch or Aqueduct	
₹		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 2 Score

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	√	Stressors	Comments/description
		Industrial/commercial	
es		Urban	
ng		Residential	
Changes	Х	Rural	
		Dryland Farming	
Use	Х	Intensive Agriculture	Feed lots nearby, plowed fields
and		Orchards or Nurseries	
Lar	Х	Livestock Grazing	Minor, on north side of Arkansas River only
II		Transportation Corridor	
ors		Urban Parklands	
SS		Dams/impoundments	
Stressors		Artificial Water body	
S		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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.

V	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
×	Dams	
×	Diversions	Creek appears to have been diverted to flow east rather than north into Rive
	Groundwater pumping	
	Draw-downs	
×	Culverts or Constrictions	Creek has been channelized in town and to the east of town.
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
×	Storm Drain/Urban Runoff	Town of Lamar
	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Class	Depletion	Augmentation		
1.0 - 0.9	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	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 increas of peak flows or capacity of water to perform work.		
<0.8 - 0.7	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	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	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.		

Variable 4 Score

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	!
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
×	Hardened/Engineered Channel	Engineered channel
	Enlarged Channel	
×	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine
1.0 - 0.9	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	Highly Functioning	Less than 10% of the AA is affected by <i>in situ</i> 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	Functioning	Between 10 and 33% of the AA is affected by <i>in situ</i> 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	Functioning Impaired	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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.

V	Stressors	Comments/description
×	Alteration of Water Source	
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
×	Hardened/Engineered Channel	Engineered channel
×	Artificial Stream Banks	
	Weirs	
×	Confined Bridge Openings	Many in study area

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	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	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc	
		Grading	
	<u>=</u>	Compaction	
	eneral	Plowing/Disking	
	jen	Excessive Sedimentation	
	Ō	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
	nly	Excessive Bank Erosion	
	ō	Channelization	
×	SI	Reconfigured Stream Channels	
×	Channels	Artificial Banks/Shoreline	
	hai	Beaver Dam Removal	
	ਹ	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

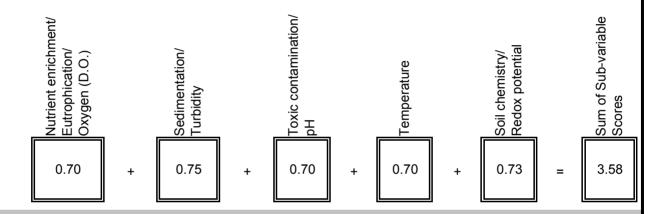
Stressor Category	Stressor Indicator	V	Comments		Sub-
	Livestock	Х	CAFOs in area		variable
	Agricultural Runoff	Х		\neg	Score
Nutrient Enrichment/	Septic/Sewage				0.70
Eutrophication/	Excessive Algae or Aquatic Veg.	Х			0.70
Oxygen (D.O.)	Cumulative Watershed NPS				
	CDPHE Impairment/TMDL List	Х	Fecal coliforms	\Box /	
	Excessive Erosion			 (
	Excessive Deposition Fine Sediment Plumes			-	
		.,		─	
Sedimentation/	Agricultural Runoff	Х			0.75
Turbidity	Excessive Turbidity			—	
-	Nearby Construction Site			-	
	Cumulative Watershed NPS			-	
	CDPHE Impairment/TMDL List			— /	
				— (
	Recent Chemical Spills			 \	
	Nearby Industrial Sites			─ ─ \	
	Road Drainage/Runoff	Х	0.450	─ \	
	Livestock	X	CAFOs in area	\	
	Agricultural Runoff	Х		— \	•
Toxic contamination/	Storm Water Runoff	Х	Town of Lamar		0.70
рН	Fish/Wildlife Impacts				
'	Vegetation Impacts			— /	
	Cumulative Watershed NPS			— /	
	Acid Mine Drainage			— /	
	Point Source Discharge			— //	
	CDPHE Impairment/TMDL List			/	
	Metal staining on rocks and veg.				
	Excessive Temperature Regime			_/\	
	Lack of Shading	Х		─	
	Reservoir/Power Plant Discharge				0.70
Temperature	Industrial Discharge				
	Cumulative Watershed NPS			/	
	CDPHE Impairment/TMDL List			— /	
	Unnatural Saturation/Desaturation			一/_	
Cail aboreistad	Mechanical Soil Disturbance			─ 	0.70
Soil chemistry/	Dumping/introduced Soil	Х			0.73
Redox potential	CDPHE Impairment/TMDL List			\Box /	

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

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

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	Scoring Rules					
OCOIC	Olass	Single Factor		Composite Score			
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5			
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5			
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0			
<0.7 - 0.6	Functioning Impaired	Any single factor scores ≥ 0.6 but <0.7	or	The factor scores sum >3.0 but ≤3.5			
< 0.6	Non- functioning	Any single factor scores < 0.6	or	The factor scores sum < 3.0			

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	\	/egetatio	n Layers		
Layers Scored (check boxes to right to indicate scored layers)					
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds					
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization			Х		
Dewatering					
Over Saturation					
Percent Cover of Layer	0.00 +	0.00 +	##### +	X	= 100
Veg. Layer Sub- variable Score	0.6	0.6	0.78		See sub-variable scoring guidelines on following page
	II	II	II	II	
Weighted Sub-variable Score	0.00 +	0.00 +	78.00 +		= 78
					Variable 9 Score

Sub-variable 9 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 Class	Scoring Guidelines			
1.0 - 0.9	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	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.			
Stressors present with enough intensity to cause significant changes in the character of vegetatic including alteration of layer coverage, structural complexity and species composition. The vegeta layer retains its essential character though. AA's with a high proportion of non-native grasses wil commonly fall in this class. Stress related change should generally be less than 33% for any give 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	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	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 the 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.

VARIA	BLE SCORE	TABLE			_
x ape	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss	0.6	3	
Buffer & Landscape Context	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0.6	35	
Br C	Variable 3:	0.6	3		
ıgy	Variable 4:	Water Source	0.6	3	
Hydrology	Variable 5:	Water Distribution	0.6	3	
Η	Variable 6:	Water Outflow	0.6	3	
and c at	Variable 7:	Geomorphology	0.6	30	
Abiotic and Biotic Habitat	Variable 8:	Chemical Environment	0.7	'5	
Abi	Variable 9:	Vegetation Structure and Complexity	0.7	'8	
Function	al Capacity	Indices			-
		Total			Functional
V1 _{wetloss}	+ V2 _{barriers} +	$V3_{\text{buffer}} + (2 \times V9_{\text{veg}})$ Functional Points			Capacity Index
0.63	+ 0.65 +		÷ 5	; =	0.69
Function 2	Support of Cl	naracteristic Fish/aquatic Habitat			
	+ (2 x V5 _{dist}) +	-	-		
1.89	+ 1.26 +	1.26 + 0.75 + 0.60 + = 5.76	÷ 9) =	0.64
Function 3	Flood Attenu				
V3 _{buffer}		$(2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{geom} + V9_{veg}$	I		
0.63	+ 1.26 +	1.26 + 1.26 + 0.60 + 0.78 = 5.79	÷ 9	=	0.64
		ng-term Water Storage			
V4 _{source}	+ (2 x V5 _{dist}) +		م . ا		0.00
0.63	+ 1.26 +	1.26 + 0.60 + = 3.75	÷ 6	, =	0.63
	Nutrient/Toxi				
(2 x V5 _{dist}) 1.26	+ V8 _{chem} + + 0.75 +	V7 _{geom} 0.60 + + + 2.61	÷ 4	L =	0.65
			- 4		0.00
	+ (2 x V7 _{geo)} +	ention/Shoreline Stabilization			
V3 _{buffer} 0.63	+ 1.20 +	1.56 + + + = 3.39	÷ 5	; = [']	0.68
	Production E	xport/Food Chain Support			<u> </u>
V1 _{wetloss}	+ [2 x V6 _{outflow} +	$V8_{chem}$ + $V7_{geo}$ + $(2 \times V9_{veg})$	_		
0.63	+ 1.26 +	0.75 + 0.60 + 1.56 + = 4.80	÷ 7	' =	0.69
		Sum of Individual FCI	Score	es	4.62

÷ 7

0.66

Divide by the Number of Functions Scored

Composite FCI Score

ADMINISTRATIVE CHARACTERIZATION

General Inforn	nation			11/30/2012				
Site Name or ID:	Wetland 16 (La	amar Canal)		US 287 Lamar Bypass				
404 or Other Perm Application #:	nit		Applicant Name:			CDOT		
Evaluator Name(s	Elly Weber		Evaluator's profess	sional position and organization:	Biologist,	Pinyon Envii	ronmental	
Location Infor	mation:							
Site Location (Lat./Long. or UTM):	38.091148006	6°, -102.579	711165°	Datum Used (NAD 83	NAD 83			
USGS Quadrangle Map:	Lamar East			Map Scale: (Circle one)	,	1:24,000 Other)1:100,000 1:	
Sub basin Name (8 digit HUC):	11020009			Wetland Ownership:	Private			
This evaluation is being performed a (Check applicable be	x Project We		Purpose of Evaluation (check all applicable):	Potentially Imp Mitigation; Pre Mitigation; Pos Monitoring Other (Describ	e-construc st-constru	tion		
Intent of Project: (Check all applicable)		Restortation	·	nancement		Creation	
Total Size of Wetla (Record Area, Check a Measurement Method	nd Describe	ac.	Measured 0.143 Estimated	3				
Assessment Area Area, check appropriate b		ac.	Measured	ac. 0.143	ac.	ac.	ac.	
are used to record acreag AA is included in a single		ac.	Estimated	ac.	ac.	ac.	ac.	
Characteristics or AA boundary dete		This AA is a	series of fringe we	tlands along th	e north ba	ank of Lamar	Canal.	
Notes: Mo:	stly cattail fringe we	etlands. Inte	rmittent and depen	dent on canal f	lows.			

ECOLOGICAL DESCRIPTION 1

Special Cor	ncerns	Check all that apply					
	s including Histosols or e AA (i.e., AA includes		Federally threa			d species are	
	lirectly impact organic s eas possessing either H	-					
	s are known to occur an wetland of which the AA			Species of con Heritage (CNH			e Colorado Natural ur in the AA?
urbanized la	·	otherwise dry or species are KNOWN to	X		urrence but	ffer area a	I conservation area as determined by
occur in the	AA? List Below.						
	Н	YDROGEOMOR	PHI	C SETTIN	<u>G</u>		
AA wetland	has been subject to ch	ntal natural hydrogeomo nange in HGM classes a escribe the original wetla	as a re	sult of anthrop	ogenic mo		vlow.
x AA wetland	was created from an u	pland setting.					
Current Co	nditions	Describe the hydrogeon that apply.	morph	ic setting of the	e wetland k	by circling	g all conditions
	Water source	Surface flow	G	roundwater	Precipi	tation	Unknown
	Hydrodynamics	Unidirectional		Vertical	Bi-direc	tional	
	Wetland Gradient	0 - 2%	⟨	2-4%	4-10%	>10	%
	# Surface Inlets	Over-bank	0		2	3	>3
HGM Setting	# Surface Outlets		0	(1)	2	3	>3
· · · · · · · · · · · · · · · · · · ·	Geomorphic Setting (Narrative Description. Include approx. stream order for riverine)	This wetland is a series	s of frin	nge wetlands a	long Willov	w Creek.	
	HGM class	Riverine		Slope	Depres	sional	Lacustrine
Historical Co	nditions						
	Water source	Surface flow	G	roundwater	Precipit	tation	Unknown
	Hydrodynamics	Unidirectional		Vertical			
Previous wetland typology	Geomorphic Setting (Narrative Description)						
	Previous HGM Class	Riverine		Slope	Depres	sional	Lacustrine
Notes (include inf	formation on the AA's I	HGM subclass and region	onal su	ubclass):			

ECOLOGICAL DESCRIPTION 2

Syster	m	Sul	bsyst	tem		Clas	S		Su	ıbcla	SS		,	Wate	er Re	gime	;	Oth	ner M	1odifi	ers	% /	ΑА
Riverin	ne	Pa	lustr	ine		UB		R	oote	d vas	scula	r			E							10	00
Littoral; Limnora Palustrine Palustrine Lower perennial; Upper perennial; Intermittent		nial;	Unco Aqua Rock Unco Em	Rock Bot. (RB) Jncon Bottom(UB) Aquatic Bed(AB) Rocky Shore(RS) Jncon 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); Seasflood./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)												
		Interm		·		rested	(FO)											Artif	icial S	ubstrat	e(r);		
Site Ma	_	Interm		Draw	For	etch ma	(FO) ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, ar
	_ =	Interm		Draw	For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, ar
cale: 1 sq.	_ =	Interm		Draw	For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, aı
cale: 1 sq.	_ =	Interm		Draw	For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, aı
ale: 1 sq.	_ =	Interm		Draw	For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, a
ale: 1 sq.	_ =	Interm		Draw	For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, a.
ale: 1 sq.	_ =	Interm		Draw	For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, a
ale: 1 sq.	_ =	Interm		Draw	For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, a
ale: 1 sq.	_ =	Interm		Draw	For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	, a
cale: 1 sq.	_ =	Interm		Draw	For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	a. a.
cale: 1 sq.	_ =	Interm		Draw	For	etch ma	ap of th		C	Organio	•	portio	Int.	expos	ed/per	menan	t(Z)	Artif Spoi	ficial Si il(s); Ex	ubstrat xcavate	e(r); ed(x)	asses,	. a

Variable 1: Habitat Connectivity - Neighboring Wetland Habitat Loss

This variable is a measure of how isolated from other naturally-occurring wetland or riparian habitat the AA has become as a result of the loss of that habitat. To score this variable, estimate the percent of naturally- occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within a 500-meter-wide belt surrounding the AA. This surrounding area is called the Habitat Connectivity Envelope (HCE). Historical photographs and NWI and hydric soils maps can be helpful in scoring this variable. In most cases the evaluator must use best professional judgment in estimating the amount of natural wetland loss. Evaluation of landforms and habitat patterns in the context of perceivable land use change should be used to steer estimates of the amount of wetland loss within the HCE. This variable is not meant to penalize AAs that are naturally isolated, or unique to the landscape. Rather, it should measure the degree to which natural habitat connectivity has been lost.

Rules for Scoring:

- 1. On the aerial photo, create a 500 meter 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 could be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, etc.
- 5. Calculate the area of existing and historical wetlands. Divide the area values to determine the percentage of naturally occurring wetland habitat that remains in the HCE, and determine the variable score using the guidelines below.

Variable Score	Condition Category	Scoring Guidelines
1.0 - 0.9	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	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	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	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	Non- functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Variable 1 Scor	E
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Notes: There are very few neighboring wetlands.

Variable 2: Habitat Connectivity - Migration/Dispersal Barriers

This 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.

	V	Stressors	Comments/description
		Major Highway	
barriers	Х	Secondary Highway	US 50
arri	Х	Tertiary Roadway	Several county roads
	Х	Railroad	
<u>cia</u>		Bike Path	
artificial		Urban Development	
ll B	Х	Agricultural Development	Cropland and pastureland
		Artificial Water Body	
SOI	Х	Fence	
Stressors	Х	Ditch or Aqueduct	
Š		Aquatic Organism Barriers	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	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	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	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	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	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.

Variable 2 Score

Variable 3: Buffer Capacity

The buffer area is defined as a 250-meter-wide belt surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to function as an effective buffer for the wetland against the deleterious effects of surrounding land use change. To score the variable, assume that the AA is 100% buffered except where land use changes inside the buffer area have diminished this quality. Identify these land use types as specific stressors in the list. For each stressor, rate severity and extent within the buffer area; then use this list to make an overall rating for the buffer's departure from reference conditions. When rating buffer capacity, consider both the intensity of the impact and the proximity of the stressor to the AA.

Rules for Scoring:

- 1. On the aerial photograph, delimit the buffer area (BA) as the zone within 250 meters of the outer boundary of the AA
- 2. Use the stressor list to record land use changes that affect buffering capacity within the buffer area. 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 all of the identified stressors, their composite severity, extent and proximity to the AA assign an overall variable score using the scoring guidelines.

	√	Stressors	Comments/description
		Industrial/commercial	
es		Urban	
ng		Residential	
Changes	Х	Rural	
		Dryland Farming	
Use	Х	Intensive Agriculture	Feed lots nearby, plowed fields
and		Orchards or Nurseries	
Lar	Х	Livestock Grazing	Minor, on north side of Arkansas River only
II		Transportation Corridor	
ors		Urban Parklands	
SS		Dams/impoundments	
Stressors		Artificial Water body	
S		Physical Resource Extraction	
		Biological Resource Extraction	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	Reference Standard	No appreciable land use change has been imposed within the TBA and it provides the full buffering capacity.
<0.9 - 0.8	Highly Functioning	Some land use change has occurred in the BA, but such changes little impair the area's ability to provide a buffering function, 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 BA.
<0.8 - 0.7	Functioning	BA has been subjected to a marked shift in land use, however, the land retains much of its original buffering capacity. 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	Functioning Impaired	Land use changes within the BA has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surface; considerable in-flow urban runoff or fertilizer-rich waters common. While, the buffering capacity of the land has been greatly diminished it is not extinguished. Intensively logged areas, low-density urban developments, some urban parklands and some cropping situations would commonly rate a score within this range.
<0.6	Non-functioning	The area within the BA provides essentially no buffering capacity. Many Commercial developments or highly urban landscapes would rate a score of less than 0.6.

Variable 3 score

Variable 4: Water Source

This variable is concerned with up-gradient hydrologic connectivity. It is a measure of the impacts to the AA's water source, including 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. For riverine systems, this variable is primarily concerned with the connection of the channel to the floodplain. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 8.

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
	Ditches or Drains (tile, etc.)	
×	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
×	Culverts or Constrictions	Several constricted bridge openings
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
×	Storm Drain/Urban Runoff	Town of Lamar
	Impermeable Surface Runoff	
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
×	Actively Managed Hydrology	Flow to canal controlled

Variable Score	Condition Class	Depletion	Augmentation	
1.0 - 0.9	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	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	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	Functioning Impaired	,	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	Non- functioning	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally highwater great enough to change the fundamental characteristics of the wetland.	

Variable 4 Score

Variable 5: 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. To score this variable, identify stressors that alter flow patterns and impact the hydrograph within the AA, including localized increases or decreases to the depth or duration of the water table or surface water. In most cases, the Water Source variable score will determine the maximum achievable score for Water Distribution, since the condition of the water source exerts a primary control on the wetland's capacity to distribute water in a characteristic fashion and exhibit a natural hydrograph.

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	!
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
×	Hardened/Engineered Channel	Engineered channel
	Enlarged Channel	
×	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
	Sediment/Fill Accumulation	

Variable Score	Condition Class	Non-riverine	Riverine	
1.0 - 0.9	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.	
Less than 10% of the AA is affected hydrologic alteration; or more wides impacts result in less than a 2 in. (§		Less than 10% of the AA is affected by <i>in situ</i> hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	unnatural periods of drying or flooding; or uniform shift in the hydrograph less than	
<0.8 - 0.7	Functioning	Between 10 and 33% of the AA is affected by <i>in situ</i> 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	33 to 66% of the AA is affected by <i>in situ</i> 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	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 5 Score

Variable 6: Water Outflow

This variable is concerned with down-gradient hydrologic connectivity and the flow of water (transporting materials and energy) out of the AA. 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, and infiltration/groundwater recharge. 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. In Variable 5, the stressors were evaluated in light of their impact on water distribution within the AA. To evaluate this variable focus on the AA's ability to export water, energy and associated materials to habitats down-gradient of the AA. In most cases, the Water Source variable score will determine the maximum achievable score for Water Outflow, since the condition of the water source exerts a primary control over the wetland's capacity to export water and associated materials.

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	
	Ditches	
	Dikes/Levees	
	Road Grades	
	Culverts	
	Diversions	
	Constrictions	
	Channel Incision/Entrenchment	
×	Hardened/Engineered Channel	Engineered channel
	Artificial Stream Banks	
	Weirs	
×	Confined Bridge Openings	Many in study area

Variable Score	Condition Class	Scoring Guidelines			
1.0 - 0.9 Reference Standard		Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.			
<0.9 - 0.8 Highly Functioning		High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") evels flow continues essentially unaltered in quantity or character.			
<0.8 - 0.7	Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.			
<0.7 - 0.6	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	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 6 Score

Variable 7: 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, diking, sedimentation due to absence of flushing floods, etc. In riverine systems geomorphic changes to stream channel should be considered if the channel is within the AA. Alterations may include bed surface changes (embeddedness or morphology changes), stream bank instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland hydrology and water relations with vegetation. Geomorphic alteration 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 the resultant effects of geomorphic change; rather focus on the physical impacts within the footprint of the alteration. The 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 constitute important, but not immediately apparent, impacts.

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
		Dredging/Excavation/Mining	
		Fill, including dikes, road grades, etc	
		Grading	
	<u>=</u>	Compaction	
	eneral	Plowing/Disking	
	jen	Excessive Sedimentation	
	Ō	Dumping	
		Hoof Shear/Pugging	
		Aggregate or Mineral Mining	
		Sand Accumulation	
		Channel Instability/Over Widening	
	nly	Excessive Bank Erosion	
	ō	Channelization	
	SI	Reconfigured Stream Channels	
×	Channels	Artificial Banks/Shoreline	
	hai	Beaver Dam Removal	
	ਹ	Substrate Embeddedness	
		Lack or Excess of Woody Debris	

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9 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	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	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	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	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 7
Score

Variable 8: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants and water quality. The origin of pollutants may be in the AA or delivered from up-gradient or surrounding areas. 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 many stressors is identified via indirect indicators.

Scoring rules:

- 1. Stressors are grouped into categories 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 stressor category, determine the sub-variable score using the scoring guideline table provided on the second page of the scoring sheet.
- -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. Determine the variable score by following the scoring guidelines.

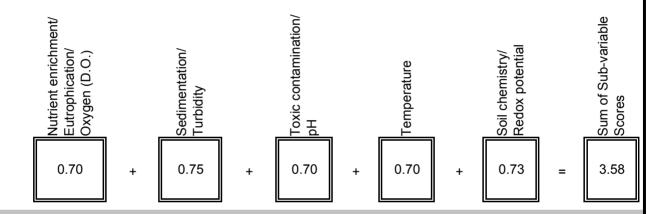
Stressor Category	Stressor Indicator	V	Comments		Sub-
	Livestock	Х	CAFOs in area		variable
	Agricultural Runoff	Х		\neg	Score
Nutrient Enrichment/	Septic/Sewage				0.70
Eutrophication/	Excessive Algae or Aquatic Veg.				0.70
Oxygen (D.O.)	Cumulative Watershed NPS			\neg	
	CDPHE Impairment/TMDL List			\Box /	
				 /	
	Excessive Erosion			\neg	
	Excessive Deposition			\neg	
	Fine Sediment Plumes			\neg	
Cadimantation/	Agricultural Runoff	Х			0.75
Sedimentation/	Excessive Turbidity				0.75
Turbidity	Nearby Construction Site			$\neg \mid /$	
	Cumulative Watershed NPS			\Box /	
	CDPHE Impairment/TMDL List			\Box /	
	·			─ /	
	Recent Chemical Spills			\neg	
	Nearby Industrial Sites			─ \	
	Road Drainage/Runoff	х		\neg	
	Livestock	Х	CAFOs in area	\dashv \	
	Agricultural Runoff	Х		\dashv \	
	Storm Water Runoff	Х	Town of Lamar		0.50
Toxic contamination/	Fish/Wildlife Impacts				0.70
рН	Vegetation Impacts			$\neg \mid /$	
	Cumulative Watershed NPS			-1 /	
	Acid Mine Drainage			-1 /	
	Point Source Discharge			-1/	
	CDPHE Impairment/TMDL List			─ //	
	Metal staining on rocks and veg.			─ /	
	Excessive Temperature Regime				
	Lack of Shading	Х		\dashv /	
	Reservoir/Power Plant Discharge	1		─ │	0.75
Temperature	Industrial Discharge				0.70
- 1. s. s. s. s.	Cumulative Watershed NPS			\dashv /	
	CDPHE Impairment/TMDL List	1		\dashv	
		1		/ /	
	Unnatural Saturation/Desaturation				
	Mechanical Soil Disturbance			\dashv)	
Soil chemistry/	Dumping/introduced Soil	Х			0.73
Redox potential	CDPHE Impairment/TMDL List			\dashv /	
	52. TIE IMPAINTION TWIDE LIST	 		-1/	

Variable 8: Water and Soil Chemical Environment

Sub-variable Scoring Guidelines

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

Input each factor score from the stressor list and calculate the sum.



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

Variable Score	Condition Class	Scoring Rules				
Ocore	Olass	Single Factor		Composite Score		
1.0 - 0.9	Reference Standard	No single factor scores < 0.9	or	The factor scores sum > 4.5		
<0.9 - 0.8	Highly Functioning	Any single factor scores ≥ 0.8 but < 0.9	or	The factor scores sum >4.0 but ≤4.5		
<0.8 - 0.7	Functioning	Any single factor scores ≥ 7.0 but < 0.8	or	The factor scores sum >3.5 but ≤ 4.0		
<0.7 - 0.6	7 - 0.6 Functioning Impaired Any single factor scores ≥ 0.6 but <0.7		or	The factor scores sum >3.0 but ≤3.5		
< 0.6	< 0.6 Non- functioning Any single factor scores < 0.6		or	The factor scores sum < 3.0		

Variable 8 Score

Variable 9: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It is particularly relevant to the wetland's ability to perform higher-order functions such as support of wildlife populations, although it also affects primary functions such as flood-flow attenuation. Score this variable by listing stressors that have affected the diversity, composition and cover of each vegetation cover class that would normally be present for the wetland type being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition.

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. Check each present or suspected vegetation layer in the third row of the table.
- 2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
- 3. Estimate the percent coverage of each vegetation layer. Aerial photographs can be helpful for this but are not required. In cases where a stratum has been thinned or removed, enter the expected coverage of that layer **not** the current percent coverage.
- 4. Enter the percent cover values as decimals in the row of the stressor table labeled "Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
- 5. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table.
- 6. 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".
- 7. Add the "Veg. Layer Sub-variable Scores" and enter the sum in the labeled cell to the right of the individual scores. Follow this same process for the "Percent Cover of Layer".
- 8. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 9 score. Enter this number in the labeled box at the bottom of this page.

	Vegetation Layers				
Layers Scored (check boxes to right to indicate scored layers)					
Stressor	Tree	Shrub	Herb	Aquatic	Comments
Noxious Weeds					
Exotic/Invasive spp.					
Tree Harvest					
Brush Cutting/Shrub Removal					
Livestock Grazing					
Excessive Herbivory					
Mowing/Haying					
Herbicide					
Loss of Zonation/Homogenization			Х		
Dewatering					
Over Saturation					
Percent Cover of Layer	0.00	0.00 +	1.00 +		= 1
	X		Х	X	
Veg. Layer Sub-					See sub-variable scoring
variable Score	0.6	0.6	0.78		guidelines on following page
Variable dedic					gandennies en ienen mig page
	II	II	II	II	-
Weighted Sub-variable Score	0.00	+ 0.00 +	0.78 +		= 0.78
					Variable 9 Score

Sub-variable 9 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 Class	Scoring Guidelines			
1.0 - 0.9	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	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	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	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	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 the 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.

VARIA	BLE SCORE	TABLE			_			
Buffer & Landscape Context	Variable 1:	Habitat Connectivity - Neighboring Wetland Habitat Loss						
	Variable 2:	Habitat Connectivity - Migration/Dispersal Barriers	0.6	5				
	Variable 3:	Buffer Capacity	0.6	3				
Hydrology	Variable 4:	Water Source	0.6	3				
	Variable 5:	Water Distribution	0.6	3				
	Variable 6:	Water Outflow	0.6	3				
and 5 at	Variable 7:	Geomorphology	0.6	0				
Abiotic and Biotic Habitat	Variable 8:	Chemical Environment	0.7	5				
Abi	Variable 9:	Vegetation Structure and Complexity	0.7	8				
Function	al Capacity	Indices			•			
	. ,	Total			Functional			
V1 _{wetloss}	+ V2 _{barriers} +	$V3_{\text{buffer}} + (2 \times V9_{\text{veg}})$ Functional Points			Capacity Index			
0.63	+ 0.65 +		÷ 5	=	0.69			
Function 2 Support of Characteristic Fish/aquatic Habitat								
	+ (2 x V5 _{dist}) +	-	-					
1.89	+ 1.26 +		÷ 9	=	0.64			
Function 3 Flood Attenuation								
V3 _{buffer}		$(2 \times V5_{dist}) + 2 \times V6_{outflow} + V7_{geom} + V9_{veg}$	l _	ı				
0.63	+ 1.26 +	1120 1 0100 1 0110 0110	÷ 9	=	0.64			
Function 4 Short- and Long-term Water Storage								
V4 _{source}	+ (2 x V5 _{dist}) +		۰. ا	ı				
0.63	+ 1.26 +	1.26 + 0.60 + = 3.75	÷ 6	=	0.63			
	Nutrient/Toxi							
(2 x V5 _{dist}) 1.26	+ V8 _{chem} + + 0.75 +	V7 _{geom}	÷ 4	=	0.65			
			- 4		0.00			
	+ (2 x V7 _{geo}) +	ention/Shoreline Stabilization						
V3 _{buffer} 0.63	+ 1.20 +	1.56 + + + = 3.39	÷ 5	=	0.68			
Function 7 Production Export/Food Chain Support								
$V1_{\text{wetloss}}$ + $2 \times V6_{\text{outflow}}$ + $V8_{\text{chem}}$ + $V7_{\text{geo}}$ + $(2 \times V9_{\text{veg}})$								
0.63	+ 1.26 +		÷ 7	=	0.69			
Sum of Individual FCI Scores								

÷ 7

0.66

Divide by the Number of Functions Scored

Composite FCI Score