

# TECHNICAL MEMORANDUM

**Date:** March 28, 2020  
**To:** April Gerth, Highways Assistant Group Manager, Robert Peccia and Associates  
**Copy to:** Montana Department of Transportation  
**From:** Susan Wall, Professional Wetland Scientist  
**Subject:** Addendum to Gore Hill Interchange STPX 15 5(141)278 BRR/PBA

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## INTRODUCTION

Herrera prepared this addendum to the Biological Resources Report and Preliminary Biological Assessment (BRR/PBA) (Herrera 2019) for the Gore Hill Interchange project to evaluate the project's potential effects on wetlands. Although the available data sources reviewed by Herrera do not indicate any wetlands or hydric soils in the study area, a potential wetland area was noted during the initial site visit in November 2019. This area, north of I-15, contains a seep on the hillslope that drains to ditches along the highway. The hillslope shows visible signs of instability (slumping) and there is a network of pipes and drains on the slope.

Herrera wetland biologist Susan Wall visited the site again on March 5 and March 26, 2020 and conducted a routine wetland delineation in accordance with the U.S. Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2) (USACE 2010).

## METHODS

To identify potential wetlands, Herrera evaluated field conditions in the entire study area and delineated wetlands based on data collected on three parameters as defined by the Regional Supplement. The three-parameter approach relies on the presence of field indicators for hydrophytic vegetation, hydric soils, and hydrology, as described in the sections below. Although the delineation was conducted outside of the growing season it was possible to obtain data on these indicators because the ground was not frozen, there was no snow cover, and vegetation was readily identifiable. On the basis of the collected data, a wetland/non-wetland determination was made for each area examined.



## Wetland Delineation

### *Vegetation*

For each test plot in the study area, the following data were recorded: dominant plant species, size of the test plot, absolute percentage of cover for each plant species, and the species' corresponding wetland indicator status. The indicator status was determined using the Great Plains 2016 Regional Wetland Plant List (Lichvar et al. 2016), which categorizes plant species according to their tolerance for growing in wetland conditions. The categories (from most tolerant to least) are obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and upland (UPL). Species dominance was established according to overall percent cover. When FAC or wetter species dominate, it indicates the presence of hydrophytic vegetation. Plant nomenclature is based on the *Manual of Montana Vascular Plants* (Lesica 2012).

### *Soils*

The presence of hydric soil indicators was determined using the Regional Supplement as a reference. The color (hue, value, and chroma) and texture for the soil matrix and redoximorphic features were determined by comparison to a Munsell Soil Color Chart (Munsell Color 2000).

### *Hydrology*

Presence or absence of wetland hydrology, as defined in the Regional Supplement, was determined at each sampling point.

## Mapping

Wetland boundaries were mapped using a sub-meter accuracy GPS unit. Shapefiles were provided to Robert Peccia and Associates for inclusion in the roadway design.

## Wetland Classification and Functional Assessment

Wetlands observed in the study area were classified according to the hydrogeomorphic (HGM) system, which is based on an evaluation of attributes such as position of the wetland within the surrounding landscape, source and location of water just before it enters the wetland, and the pattern of water movement in the wetland (Brinson 1993). Wetlands were also classified according to the US Fish and Wildlife Service (USFWS) classification system (FGDC 2013), which is based on an evaluation of attributes such as vegetation class, hydrologic regime, salinity, and substrate type.

Wetland functions were assessed using the MDT Montana Wetland Assessment Method (MWAM) (Berglund and McEldowney 2008). This method is designed to evaluate wetland functions and values for linear transportation projects in Montana, such as highways, railroads, pipelines, and transmission lines.

## RESULTS

Herrera identified three wetlands, Wetland 1a, 1b, and 1c, in the study area north of I-15 that are hydrologically connected by surface water seepage from the hillslope. Highway runoff and seepage from these wetlands drains through culverts under I-15 to concrete lined ditches. Based on aerial photo interpretation it appears that flow from the wetlands eventually disperses and infiltrates in fields south of I-15. There does not appear to be a connection to any other streams or waterbodies.

Wetlands 1a, 1b, and 1c received a functional rating of Category IV. Their primary functions are toxicant removal due to capturing and infiltrating highway runoff, and groundwater discharge due to seepage from the hill slope. Their vegetation diversity is low, and they do not provide valuable or desirable wildlife habitat.

A figure showing the location of the wetlands is provided in Appendix A. Wetland determination data forms are included in Appendix B, photographs are included in Appendix C and the functional assessment rating form is included in Appendix D. Wetlands and adjacent uplands are described below.

### Wetland 1a

Wetland 1a is an emergent depressional wetland in a ditch north of I-15. The wetland is 1,829 square feet (0.042 acre) in size. Vegetation is dominated by common cattail (*Typha latifolia*) and Baltic rush (*Juncus balticus*). The water sources for this wetland are highway runoff, precipitation, snowmelt, and seepage from the adjacent hillslope. There is a small patch of sandbar willow (*Salix exigua*) within the wetland. Several metal drainage gutters convey water to the wetland from the adjacent hillslope and standing water was observed in the ditch. The wetland determination is documented on data form WL1a SP1 in Appendix B.

### Wetland 1b

Wetland 1b is a seep wetland on the hillslope north of I-15. The wetland is 5,092 square feet (0.112 acre) in size. Vegetation is dominated by common cattail with a minor amount of Baltic rush. The water source for this wetland is primarily groundwater. The slope has obvious signs of slumping, and small drainage channels emerge from the downslope side of the wetland. The wetland determination is documented on data form WL1b SP1 in Appendix B.

## Wetland 1c

Wetland 1c is an emergent and scrub/shrub depressional wetland in a ditch north of I-15, similar to Wetland 1a. The wetland is 11,682 square feet (0.268 acre) in size. Vegetation is dominated by common cattail and sandbar willow. The water sources for this wetland are highway runoff, precipitation, snowmelt, and seepage from the adjacent hillslope. Standing water was observed in the ditch. The wetland drains to a culvert under I-15. The wetland determination is documented on data form WL1c SP1 in Appendix B.

## Adjacent Upland

Vegetation on the upland slope adjacent to Wetlands 1a, 1b, and 1c is dominated by smooth brome (*Bromus inermis*) and patches of tall hedge-mustard (*Sisymbrium altissimum*), Canada thistle (*Cirsium arvense*) and showy milkweed (*Asclepias speciosa*). The non-wetland determinations for each wetland are documented on data forms WL1a SP2, WL1b SP2 and WL1c SP2 in Appendix B.

## CONCLUSION

This addendum provides documentation to support the Aquatic Resources section of the BRR/PBA submitted by Herrera in December 2019. Based on the study results, the areas displayed as wetlands on the figure in Appendix A meet the criteria established by the USACE 1987 Wetland Delineation Manual and the Regional Supplement for being classified as wetland.

## REFERENCES

Berglund, J., and R. McEldowney. 2008. MDT Montana Wetland Assessment Method. Prepared for Montana Department of Transportation by Post, Buckley, Schuh, and Jernigan. Helena, Montana.

Brinson, M.M. 1993. A Hydrogeomorphic Classification for Wetlands. Technical Report WRPDE4. US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. August.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. US Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

FGDC. 2013. Classification of Wetlands and Deepwater Habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and US Fish and Wildlife Service, Washington, DC.

Herrera. 2019. Biological Resources Report/Preliminary Biological Assessment Gore Hill Interchange STPX 15 5(141)278 Great Falls, Montana. Prepared for Montana Department of Transportation. Prepared by Herrera Environmental Consultants, Missoula, Montana through Robert Peccia and Associated, Helena, Montana.

Lesica. 2012. Manual of Montana Vascular Plants. Botanical Research Institute of Texas Press, Fort Worth, Texas.

Lichvar et al. 2016. Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 215 Available at [https://www.codot.gov/programs/environmental/wetlands/nwpl\\_gp\\_2016v1.pdf](https://www.codot.gov/programs/environmental/wetlands/nwpl_gp_2016v1.pdf)

Munsell Color. 2000. Munsell Soil Color Charts. GretagMacbeth. New Windsor, New York.

USACE. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0). ERDC/EL TR-10-1. US Army Corps of Engineers Research and Development Center, Vicksburg, Mississippi.



# APPENDIX A

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## Wetland Figure

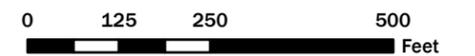




Figure A-1.  
Wetlands Identified for the Gore Hill Interchange Improvements Project.

Legend

- Sample Plots
- Wetland
- Study area



ESRI (2019)



# APPENDIX B

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## Data Forms





**SOIL**

<b>Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)</b>											
Depth (inches)	Matrix		Redox Features				Texture	Remarks			
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>					
0-3	10YR 3/1	100					Sandy loam				
<sup>1</sup> Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix											
<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>						<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>					
<input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input checked="" type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)						<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)			<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)		
<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.											
<b>Restrictive Layer (if present):</b>					<b>Hydric Soil Present?</b>						
Type: Angular cobble Depth (inches): 3					Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>						
Remarks: Hydric soil indicator A4 is present.											

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>					
Primary Indicators (minimum of one required; check all that apply)			Secondary Indicators (2 or more required)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Drift Deposits (B3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Oxidized Rhizospheres (C3) (where not tilled)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)	
<b>Field Observations:</b>			<b>Wetland Hydrology Present?</b>		
Surface Water Present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Water Table Present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches):			
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 0			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:					
Remarks: Indicator A3, B10, D2, and D5 are present. Patches of surface water is present in the wetland but not at the sample plot.					

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Gore Hill Interchange City/County: Great Falls, Cascade Sampling Date: 3/26/2020  
 Applicant/Owner: Montana Department of Transportation State: MT Sampling Point: WL1a SP2  
 Investigator(s): S. Wall Section, Township, Range: S21 T20N R03E  
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 20  
 Subregion (LRR): F Lat: 47.4768333 Long: -111.3546139 Datum:  
 Soil Map Unit Name: Tally-Castner complex, 15 to 35 percent slopes NWI classification: none  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , Or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , Or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: <b>Hydroc soil is present, but hydrophytic vegetation and wetland hydrology are lacking.</b>			

### VEGETATION – Use scientific names of plants

<u>Tree Stratum</u> (Plot Size: 3m radius)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test Worksheet:</b>																
1.				Number of Dominant Species That Are OBL, FACW, or FAC: <b>0</b> (A)  Total Number of Dominant Species Across All Strata: <b>1</b> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <b>0</b> (A/B)																
2.																				
3.																				
4.																				
0 = Total Cover				<b>Prevalence Index worksheet:</b>  <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><u>Total % Cover of:</u></td> <td style="text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species</td> <td>x1 =</td> </tr> <tr> <td>FACW species</td> <td>x2 =</td> </tr> <tr> <td>FAC species</td> <td>x3 =</td> </tr> <tr> <td>FACU species</td> <td>x4 =</td> </tr> <tr> <td>UPL species</td> <td>x5 =</td> </tr> <tr> <td>Column Totals:</td> <td>(A)    (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A =</td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species	x1 =	FACW species	x2 =	FAC species	x3 =	FACU species	x4 =	UPL species	x5 =	Column Totals:	(A)    (B)	Prevalence Index = B/A =	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species	x1 =																			
FACW species	x2 =																			
FAC species	x3 =																			
FACU species	x4 =																			
UPL species	x5 =																			
Column Totals:	(A)    (B)																			
Prevalence Index = B/A =																				
<u>Sapling/Shrub Stratum</u> (Plot Size: 3m radius)																				
1.																				
2.																				
3.																				
4.																				
5.																				
0 = Total Cover																				
<u>Herb Stratum</u> (Plot Size: 1m radius)																				
1. <b>Bromus inermis</b>	100	x	UPL																	
2.																				
3.																				
4.																				
5.																				
6.																				
7.																				
8.																				
9.																				
10.																				
11.																				
= Total Cover																				
<u>Woody Vine Stratum</u> (Plot Size: 3m radius)																				
1.																				
2.																				
0 = Total Cover																				
% Bare Ground in Herb Stratum = 0																				
<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>																				

Remarks: **No hydrophytic vegetation indicators present.**

**SOIL**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5	10YR 3/2	100					loam	
5-12	10YR 2/1	50					Platy silt loam	The 5-12 inch layer has mixed matrix
5-12	10YR 3/2	30	10YR 6/6	20	C	M	Sandy loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input checked="" type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)
	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if present):</b> Type: Angular cobble Depth (inches): 12	<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks: Soil meets indicator F6.

**HYDROLOGY**

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)	
<input type="checkbox"/> Water-Stained Leaves (B9)			

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): Saturation Present? (includes capillary fringe)    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):	<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present.



**SOIL**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-10	2.5Y 3/2	100					Clay loam	
10-16	2.5Y 3/2	80	10YR 5/6	20	C	M	Clay loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)			Indicators for Problematic Hydric Soils <sup>3</sup> :		
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)			
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)			
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)			
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)			
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Reduced Vertic (F18)			
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)			
<input type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)			
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> Redox Depressions (F8)				
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)				

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if present):</b> Type: Depth (inches):	<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Meets indicator F6	

**HYDROLOGY**

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) (where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)	
<input type="checkbox"/> Water-Stained Leaves (B9)			

<b>Field Observations:</b> Surface Water Present?      Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): Water Table Present?      Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): Saturation Present? (includes capillary fringe)      Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 18	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: Visible slumping, drainage channel flowing out of the wetland.	



**SOIL**

<b>Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)</b>								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-8	10YR 3/3	100						
8-16	10YR 3/1	95	2.5Y 5/4	5	C	M	Platy shale	

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input checked="" type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)
	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if present):</b> Type: Depth (inches): Remarks: Meets indicator F6	<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
---	---

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) (where not tilled) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)	
<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): Saturation Present? (includes capillary fringe)    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches):		<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: No wetland hydrology indicators present			



**SOIL**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-8	10YR 3/1	100					Sandy clay loam	
8-16	10YR 3/1	90	10YR 4/6	10	C	M	Sandy clay loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR F) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input checked="" type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)
	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H) <input type="checkbox"/> Dark Surface (S7) (LRR G) <input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if present):</b> Type: Depth (inches):	<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks: Soil meets indicator F6

**HYDROLOGY**

Wetland Hydrology Indicators:	Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) (where not tilled) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): Saturation Present? (includes capillary fringe)    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Wetland hydrology indicators A3, B10 and D2 are present.

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Gore Hill Interchange City/County: Great Falls, Cascade Sampling Date: 3/26/2020  
 Applicant/Owner: Montana Department of Transportation State: MT Sampling Point: WL1c SP2  
 Investigator(s): S. Wall Section, Township, Range: S21 T20N R03E  
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 20  
 Subregion (LRR): F Lat: 47.4755333 Long: -111.3568194 Datum:  
 Soil Map Unit Name: Tally-Castner complex, 15 to 35 percent slopes NWI classification: none  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , Or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , Or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks: <b>Hydric soil and wetland hydrology present, but hydrophytic vegetation lacking. Wetland hydrology (saturation) likely due to recent snowmelt.</b>			

### VEGETATION – Use scientific names of plants

<u>Tree Stratum</u> (Plot Size: 3m radius)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test Worksheet:</b>
1.				Number of Dominant Species That Are OBL, FACW, or FAC: <b>0</b> (A)  Total Number of Dominant Species Across All Strata: <b>3</b> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <b>0</b> (A/B)
2.				
3.				
4.				
	<b>0</b>	= Total Cover		
<u>Sapling/Shrub Stratum</u> (Plot Size: 3m radius)				
1.				<b>Prevalence Index worksheet:</b>  <div style="display: flex; justify-content: space-between;"> <span><u>Total % Cover of:</u></span> <span><u>Multiply by:</u></span> </div> OBL species                    x1 = FACW species                    x2 = FAC species                    x3 = FACU species                    x4 = UPL species                    x5 = _____  Column Totals:                    (A)                    (B)  Prevalence Index = B/A =
2.				
3.				
4.				
5.				
	<b>0</b>	= Total Cover		
<u>Herb Stratum</u> (Plot Size: 1m radius)				
1. <b>Bromus inermis</b>	85	x	UPL	<b>Hydrophytic Vegetation Indicators:</b>  1 – Rapid Test for Hydrophytic Vegetation 2 – Dominance Test is >50% 3 – Prevalence Index is <3.0 <sup>1</sup> 4 – Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <b>Verbascum thapsus</b>	10		UPL	
3. <b>Cirsium arvense</b>	5		FACU	
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
	<b>100</b>	= Total Cover		
<u>Woody Vine Stratum</u> (Plot Size: 3m radius)				
1.				<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2.				
	<b>0</b>	= Total Cover		
% Bare Ground in Herb Stratum = <b>0</b>				

Remarks: **No hydrophytic vegetation indicators present.**

**SOIL**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	10YR 3/2	100					loam	
4-10	10YR 2/1	70					Platy silt loam	The 4-10 inch layer has mixed matrix
4-10	10YR 3/2	20	5YR 3/4	10	C	M	Sandy loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> High Plains Depressions (F16) (MLRA 72 & 73 of LRR H)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):	Hydric Soil Present?	Yes	No
Type: Angular cobble		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Depth (inches): 10			

Remarks: Soil meets indicator F6.

**HYDROLOGY**

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) (where not tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

Field Observations:		Wetland Hydrology Present?	Yes	No
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			

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

Remarks: Saturation present, likely due to recent snowmelt.

# APPENDIX C

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## Photographs



# GORE HILL INTERCHANGE WETLAND ADDENDUM- PHOTOGRAPHIC LOG

Photo Number	Photo Description
1	Wetland 1a SP1 wetland, and 1a SP2 upland sample plots
2	Wetland 1b SP1 sample plot, upland in background
3	Wetland 1b slumping on downslope side
4	Wetland 1c (right) and WL1c SP2 upland sample plot(left)





1. Wetland 1a SP1 wetland, and 1a SP2 upland sample plots



2. Wetland 1b SP1 sample plot, upland in background



3. Wetland 1b slumping on downslope side



4. Wetland 1c (right) and WL1c SP2 upland sample plot (left)



# APPENDIX D

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## Functional Assessment





## SECTION PERTAINING to FUNCTIONS & VALUES

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

- Primary or critical habitat (list
- Secondary habitat (list species)
- Incidental habitat (list species)
- No usable habitat

S

ii. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7H	.3L	.1L	0L

Sources for documented use (e.g. observations, records, etc):

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed

i. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

- Primary or critical habitat (list
- Secondary habitat (list species)
- Incidental habitat (list species)
- No usable habitat

S

ii. Rating (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: Functional Points and Rating	1H	.8H	.7H	.6H	.2L	.1L	0L
S2 and S3 Species: Functional Points and Rating	.9H	.7H	.6H	.5H	.2L	.1L	0L

Sources for documented use (e.g. observations, records, etc):

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA (circle substantial, moderate, or low based on supporting evidence):

Substantial (based on any of the following [check]):

- observations of abundant wildlife #s or high species diversity (during any period)
- abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- presence of extremely limiting habitat features not available in the surrounding
- interviews with local biologists with knowledge of the AA

Minimal (based on any of the following [check]):

- few or no wildlife observations during peak use periods
- little to no wildlife sign
- sparse adjacent upland food sources
- interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):

- observations of scattered wildlife groups or individuals or relatively few species during peak periods
- common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- adequate adjacent upland food sources
- interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, circle appropriate AA attributes in matrix to arrive at rating. Structural is from #13. For class cover to be considered evenly distributed, the most and least prevalent vegetated classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms])

Structural diversity (see	High								Moderate								Low			
	Even				Uneven				Even				Uneven				Even			
Class cover distribution (all vegetated classes)																				
Duration of surface water in >=10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and

Evidence of wildlife use (i)	Wildlife habitat features rating (ii)			
	Exceptional	High	Moderate	Moderate
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	.7M	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

Comments Observed some deer and small mammal tracks during November site visit

14D. General Fish Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not used by fish, fish use is not restorable due to constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then mark X NA and proceed to 14E.)

Type of Cold Water (CW) X Warm Water (WW)      Use the CW or WW guidelines in the user manual to complete the

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [circle] the functional points and rating)

Duration of surface water in AA	Permanent / Perennial						Seasonal / Intermittent						Temporary / Ephemeral					
	Optimal		Adequate		Poor		Optimal		Adequate		Poor		Optimal		Adequate		Poor	
Aquatic hiding / resting / escape cover	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
Thermal cover optimal / suboptimal	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
FWP Tier I fish species	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.2L
FWP Tier II or Native Game fish	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in

ii. Modified Rating (NOTE: Modified score cannot exceed 1 or be less than 0.1)

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity or is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support, or do aquatic nuisance plant or animal species (see Appendix E) occur in fish habitat?      If yes, reduce score in i above by 0.1.

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- comments) for native fish or introduced game fish?      If yes, add 0.1 to the adjusted score in i or iia.

iii. Final Score and      NA      Comments:

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded in-channel or overbank flow, mark X NA and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	Slightly entrenched - C, D, E stream types			Moderately entrenched - B stream type			Entrenched-A, F, G stream types		
	75%	25-	<25%	75%	25-	<25%	75%	25-	<25%
% of flooded wetland classified as forested and/or									
AA contains no outlet or restricted outlet	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains unrestricted outlet	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Entrenchment ratio (ER) estimation – see User’s Manual for additional guidance. Entrenchment ratio = (flood-prone width)/(bankfull width) Flood-prone width = estimated horizontal projection of where 2 x maximum bankfull depth elevation intersects the floodplain on each side of the stream.

$$\frac{\text{Flood-prone width}}{\text{Bankfull width}} = \text{Entrenchment ratio (ER)}$$



Slightly Entrenched ER = >2.2			Moderately Entrenched	Entrenched ER = 1.0 – 1.4		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type

ii. Are 10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods mile downstream of the AA (circle)?      Comments:

14F. Short and Long Term Surface Water Storage: (Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, surface flow, or groundwater flow. If no wetlands in the AA are subject to flooding or ponding, mark \_\_\_ NA and proceed to 14G.)

i. Rating (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic	>5 acre feet			1.1 to 5 acre feet			<=1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond >= 5 out of 10 years	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond < 5 out of 10 years	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments Wetlands A and C hold stormwater runoff and seepage from adjacent slope

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, mark \_\_\_ NA and proceed to 14H.)

i. (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H=high, M=moderate, or L=low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in	>= 70%		< 70%		>= 70%		< 70%	
Evidence of flooding / ponding in	Yes	No	Yes	No	Yes	No	Yes	No
AA contains no or restricted	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains unrestricted outlet	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments Wetland C has a culvert that restricts outflow. Wetlands A and B do not have evidence of an outlet.

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, mark \_X\_ NA and proceed to 14I.)

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

% Cover of <u>wetland</u> streambank or shoreline by species with stability ratings of >=6 (see	Duration of surface water adjacent to rooted vegetation		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
>= 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
35%	.3L	.2L	.1L

Comments

14I. Production Export/Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings [circle])

General Fish Habitat Rating (14D.iii.)	General Wildlife Habitat Rating (14C.iii.)		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

ii. Rating (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as previously defined, and A = "absent" [see instructions for further definitions of these terms].)

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component < 1 acre					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1H	.7M	.8H	.5M	.6M	.4M	.9H	.6M	.7M	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7M	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (NOTE: Modified score cannot exceed 1 or be less than 0.1.) Vegetated Upland Buffer (VUB): Area with >= 30% plant cover, = 15% noxious weed or ANVS cover, and that is not subjected to periodic mechanical mowing or clearing (unless for

a) Is there an average >= 50 foot-wide vegetated upland buffer around >= 75% of the AA circumference? \_\_\_ If yes, add 0.1 to the score in ii above.

iv. Final Score and

0.30L

Comments:

No evidence of connection to a downstream waterbody. Water in Wetlands A and B appears to infiltrate. Culvert under I-15 conveys flow from Wetland A to a concrete lined ditch. Based on aerial photo interpretation it appears that flow from the wetlands eventually disperses and infiltrates in fields south of I-15. There does not appear to be a connection to any other streams or waterbodies.

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below)

i. Discharge Indicators

- The AA is a slope wetland
- Springs or seeps are known or observed
- Vegetation growing during dormant season/drought
- Wetland occurs at the toe of a natural slope
- Seeps are present at the wetland edge
- AA permanently flooded during drought periods
- Wetland contains an outlet, but no inlet
- Shallow water table and the site is saturated to the surface
- Other:

ii. Recharge Indicators

- Permeable substrate present without underlying impeding layer
- Wetland contains inlet but no outlet
- Stream is a known 'losing' stream; discharge volume decreases
- Other:

iii. Rating (use the information from i and ii above and the table below to arrive at [circle] the functional points and rating)

Criteria	Duration of saturation at AA Wetlands FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM			
	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information	N/A			

Comments Estimated duration of saturation is based on general climate pattern for Great Falls.

14K.

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland or plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate		
	rare	common	abundant	rare	common	abundant	rare	common	abundant
Estimated relative abundance									
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7M	.6M	.6M	.4M	.3L	.3L	.2L	.1L

14L. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential rec./ed. site: (circle) (if 'Yes' continue with the evaluation; if 'No' then mark X NA and proceed to the overall summary and rating page)

ii. Check categories that apply to the  Educational/scientific  Consumptive  Non-consumptive  Other :

iii. Rating (use the matrix below to arrive at [circle] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public	.1M	.05L

Comments

General Site Notes
The wetlands are highly disturbed, have little vegetation diversity, provide little value for wildlife and are not in a desirable location for wildlife.

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0.00	1		
B. MT Natural Heritage Program Species	L	0.00	1		
C. General Wildlife Habitat	L	0.20	1		*
D. General Fish Habitat	NA				
E. Flood Attenuation	NA				
F. Short and Long Term Surface Water	L	0.30	1		*
G. Sediment/Nutrient/Toxicant Removal	H	1.00	1		*
H. Sediment/Shoreline Stabilization	NA				
I. Production Export/Food Chain Support	L	0.30	1		
J. Groundwater Discharge/Recharge	M	0.70	1		*
K. Uniqueness	L	0.10	1		
L. Recreation/Education Potential (bonus points)	NA				
Totals:		2.60	8.00		
Percent of Possible Score			33%		

Category I Wetland: (must satisfy one of the following criteria; otherwise go to Category II)  
 \_\_\_ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or  
 \_\_\_ Score of 1 functional point for Uniqueness; or  
 \_\_\_ Score of 1 functional point for Flood Attenuation and answer to Question 14E.ii is "yes"; or  
 \_\_\_ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied and meets any one of the following criteria; otherwise go to  
 \_\_\_ Score of 1 functional point for MT Natural Heritage Program Species Habitat; or  
 \_\_\_ Score of .9 or 1 functional point for General Wildlife Habitat; or  
 \_\_\_ Score of .9 or 1 functional point for General Fish Habitat; or  
 \_\_\_ "High" to "Exceptional" ratings for both General Wildlife Habitat and General Fish/Aquatic Habitat; or  
 \_\_\_ Score of .9 functional point for Uniqueness; or  
 \_\_\_ Percent of possible score > 65% (round to nearest whole #).

Category III Wetland: (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; otherwise go to Category III)  
 "Low" rating for Uniqueness; and  
 Vegetated wetland component 1 acre (do not include upland vegetated buffer); and  
 Percent of possible score 35% (round to nearest whole #).

OVERALL ANALYSIS AREA

IV