AQUATIC RESOURCES INVENTORY

Wetland Delineation & Surface Waters

WY State Highway 22 Right-of-Way
West of Spring Gulch Road

9 Acre Study Area
located within
NE1/4 Sec 31, NW1/4 Sec. 32, & SW1/4 Sec. 29
Township 41N, Range 116W
Teton County, WY

March 14, 2016

Prepared for:
Jackson Hole Community Pathways
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INTRODUCTION

An Aquatic Resources Inventory (ARI) was conducted to ensure compliance with Section 404 of the Federal Clean Water Act and Teton County Land Development Regulations and to provide the necessary information to assist the U.S. Army Corps of Engineers (USACE) and Teton County in their determination of aquatic resource presence, boundaries and jurisdiction within the Study Area. The ARI was prepared by Brian Remlinger, *Professional Wetland Scientist,* with Alder Environmental, LLC at the request of Brian Schilling, Jackson Hole Community Pathways Coordinator.

STUDY AREA LOCATION

The ARI Study Area consisted of 9-acres located on the southern half of the Wyoming State Highway 22 Right-of-Way west of Spring Gulch Road in Teton County, WY (Appendix A - Figure 1).

Directions

From the Town of Jackson, WY at the intersection of West Broadway and WY State Highway 22 head west on Highway 22 for ¼ mile. The Study Area starts at the intersection with Spring Gulch Road and continues west for 0.9 miles.

Public Land Survey System

NE1/4 Sec. 31, NW1/4 Sec. 32, & SW1/4 Sec. 29, Township 41N, Range 116W, 6th Prime Meridian, Teton County, WY

METHODS

This ARI was completed according to a USACE Wyoming Regulatory Office *Aquatic Resources Inventory Guidance* memo dated May 10, 2011. The ARI included a routine wetland delineation conducted in accordance with the *1987 Corps of Engineers Wetlands Delineation Manual* and the *2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (version 2).*

Preliminary data (described below; Appendix A –Figure 2) was reviewed prior to the onsite inspections conducted on October 13, 2011, March 5, 2015, July 20, 2015, and March 10, 2016. Seven (7) sample points were selected as necessary to identify various vegetative communities and topographic positions found in the Study Area (Appendix A - Figure 3). Digital photos were taken to document sampling points (Appendix B). The *U.S. Army Corps of Engineers 2014 National Wetland Plant List, version 3.2* website (http://wetland_plants.usace.army.mil/) and *The National Wetland Plant List: 2014 Update of Wetland Ratings* (Lichvar, 2014) were used as references for vegetation wetland indicator status.

Maps were prepared using ArcGIS 10.3.3 in the following datum and coordinate system; NAD 1983 StatePlane Wyoming West FIPS 4904 Feet. The geographic locations of the sample points were located using a resource grade GPS (Appendix A - Figure 3). The wetland boundaries shown on Figure 3 were located using the resource grade GPS, surveyed or partially digitized in ArcMap according to the aerial imagery dependent on which of the four site visits determined the boundaries.

EXISTING INFORMATION REVIEW

The following existing site information was initially reviewed to determine the presence or absence of aquatic resources in the Study Area and to understand the resources within the vicinity (Appendix A – Figures 1 & 2).

Topographic Map

The US Geological Survey 1:24,000 scale topographic map shows the Study Area located within the flood irrigated Spring Gulch drainage of the Jackson Hole valley. The Study Area consists of a steep topographic relief created by the highway road bed fill sloping down to natural grade to the south. The general flow of water is north to south.

Aerial Imagery

Aerial imagery from 1945 through 2015 was evaluated to determine historic land use, hydrologic features and vegetation. 2015 Teton County color infrared imagery displays areas of potential wetlands in darker pink and surface water/saturated soil surfaces in dark blue. (Appendix A – Figure 2).

National Wetlands Inventory (NWI) and National Hydrography Dataset (NHD)

The NWI and NHD datasets do not show any aquatic resources in the Study Area other than Spring Creek running through a culvert under the highway. The NWI layer shows palustrine emergent and scrub shrub wetlands to the immediate north and south of the Study Area where flood irrigation occurs.

Soil Survey

The soil survey conducted by the U.S. Department of Agriculture – Natural Resources Conservation Services (USDA-NRCS) indicates five soil types in the Study Area. Two of these soils, Newfork fine sandy loam and Tetonville gravelly loam, are listed as hydric soils in Wyoming. The highway road base fill was not included in the soil survey inventory.

DESCRIPTION OF STUDY AREA

Land Use

According to the Teton County GIS Mapserver historical aerial photos, the land to the north and south of highway has historically been flood irrigated for hay production and cattle pasture. Several supply, lateral and drainage ditches have also been constructed. Since 1945, the Study Area has remained well vegetated with agricultural grasses, willows and sparsely vegetated roadside grasses. The highway was constructed between 1945 and 1955. The ditches flowing through the Study Area have existed for over a century and have remained mostly undisturbed since the earliest aerial photo in 1945.

WETLAND DELINEATION

A total of 3 upland and 4 wetland sample points were used to delineate 0.56 acres of palustrine emergent wetlands within the Study Area (Appendix A - Figure 3). Photos of the wetlands and sample points are provided in Appendix B. The Wetland Determination Sample Point Data Forms are provided in Appendix C. The following describes the vegetation, soils, and hydrology of these special aquatic sites and adjacent uplands.

Vegetation

Wetland vegetation in the Study Area consisted of herbaceous and shrub stratum species with obligate and facultative wetland hydrophytic status. The following table (Table 1) lists the vegetation found in the Study Area. The table also indicates whether a species was found to be dominant in a wetland or upland sample plot. The dominance test was performed to determine if a wetland was present based upon hydrophytic vegetation. Many facultative and facultative upland plant species were observed in or adjacent to wetland sites, indicating the delineated wetlands may experience prolonged drier periods during the growing season or groundwater depths less than 12" due to steep slopes. The vegetation is also indicative of a disturbed or degraded site with little to no vegetation diversity and nonnative/ weedy species.

Table 1: Vegetation Observed at Sample Points

Vegetation			
Latin Root	**Common Name**	**Wetland**	**Upland**
Herbaceous Stratum			
Carex utriculata (OBL)	Northwest Territory sedge	X	
Phalaris arundinacea (FACW)	Reed canarygrass	X	X
Juncus arcticus (FACW)	Arctic rush		X
Bromus inermis (FAC)	Smooth brome		X
Alopecurus pratensis (FAC)	Meadow foxtail	X	X
Cirsium arvense (FAC)	Canada thistle	X	X
Pascopyrum smithii (FACU)	Western wheatgrass		X
Sapling/Shrub Stratum			
Salix exigua (FACW)	Narrow leaf or coyote willow	X	
Woody Vine Stratum			
None			
Tree Stratum			
None			

Soils

Soil textural analysis and morphology documentation was performed by hand during the field investigations and differed from the soil survey due to the disturbed nature of the site. The site consisted of both road base fill and excavated ditches. Soils observed in the wetlands included gravely silts and silt loams with gravel at deeper depths. The upland sample points mostly consisted of a gravelly road base. The field hydric soil indicators observed in the Study Area wetlands were Depleted Dark Surface (F7).

Hydrology

Primary wetland hydrology indicators were present during the October 2011 wetland delineation field work, but not the March 2015 and 2016 field work. In October 2011, the water table and saturation were observed in soil pits dug to 16 inches depth and groundwater discharges and surface water collection from the irrigation season were present in the primary ditch. These indicators were not present in March 2013 and 2014. Therefore, secondary wetland hydrology indicators were relied upon to determine wetland hydrology presence during the March site visit. Geomorphic Position, Drainage Patterns and Dry Season Water Table indicators were the secondary indicators used. Further discussion on wetland hydrology and irrigation water influences is provided in the following section.

AQUATIC RESOURCES SUMMARY

The following is a summary table of aquatic resources inventoried in the Study Area. The aquatic resource feature labels correspond to those on Figure 3 and Figure 4.

TABLE 2. Aquatic Resources Summary Table

Aquatic Resource Feature	Sample Point IDs	Aquatic Resource Type	Cowardin Classification	Area (acres)	Comments	Photo Number
Spring Creek	n/a	Surface Water	R3UB1	n/a	Ditch/ Ponded	3
Supply Ditches	n/a	Surface Water	R4UB3	n/a	Irrigation supply ditch	2, 20
Return Ditches	n/a	Surface Water	R4UB3	n/a	Return water ditch	South of project area (Figure 3 & 4)
Wetland	SP-1, SP-3, SP-5, SP-7	Scrub-Shrub Wetland	PSSE	0.56	Hydrology supplied primarily by flood irrigation and ditches. Natural Wetland Hydrology Area shown in Figure 4 is influenced by natural hydrology associated with Spring Creek.	1-21

ASSESSMENT OF WETLAND HYDROLOGY

Since 2011, wetlands and surface waters within the Study Area have been observed during spring, summer and fall seasons to evaluate hydrologic responses to flood irrigation practices taking place to the north and west of the Study Area (Appendix A - Figure 4).

Natural surface water hydrology in the Spring Gulch drainage is likely the result of spring seeps flowing at the base of East and West Gros Ventre Buttes. In addition, flooding and groundwater recharge from the Gros Ventre River may contribute to flows in the Spring Creek channel. For over a century, water from the Gros Ventre River has been diverted into the Spring Gulch drainage and applied as flood irrigation. This diversion activity significantly influences hydrologic processes within the Spring Gulch drainage.

Spring Creek (natural channel) and three (3) constructed irrigation supply ditches (Spring Creek Ditch, Badger Ditch, and Stephen Adams Ditch) flow through the Study Area (Appendix A - Figure 4). In addition, a return ditch flows west back to Spring Creek from the Stephen Adams ditch south of the Study Area. The areas adjacent to Spring Creek and the low lying Natural Wetland Hydrology Area to the east of Spring Creek (circled in white in Figure 4) have perennial surface and groundwater (estimated to be <12” deep). Wetlands in this area likely have natural hydrology in addition to irrigation induced hydrology. Wetlands adjacent to and within the Stephen Adams Ditch, Badger Ditch and Spring Creek Ditch are influenced by irrigation practices and not natural hydrologic conditions. When these ditches are receiving diverted water from Spring Creek, they do not have wetland hydrology.

Visual observations, soil pit data, water rights research as well as the assessment of the land use and topography to the north support my professional opinion that wetland hydrology adjacent to and within the

Supply Ditches within the Study Area is a result of flood irrigation practices (irrigation induced) and not natural hydrologic influences.

REFERENCES

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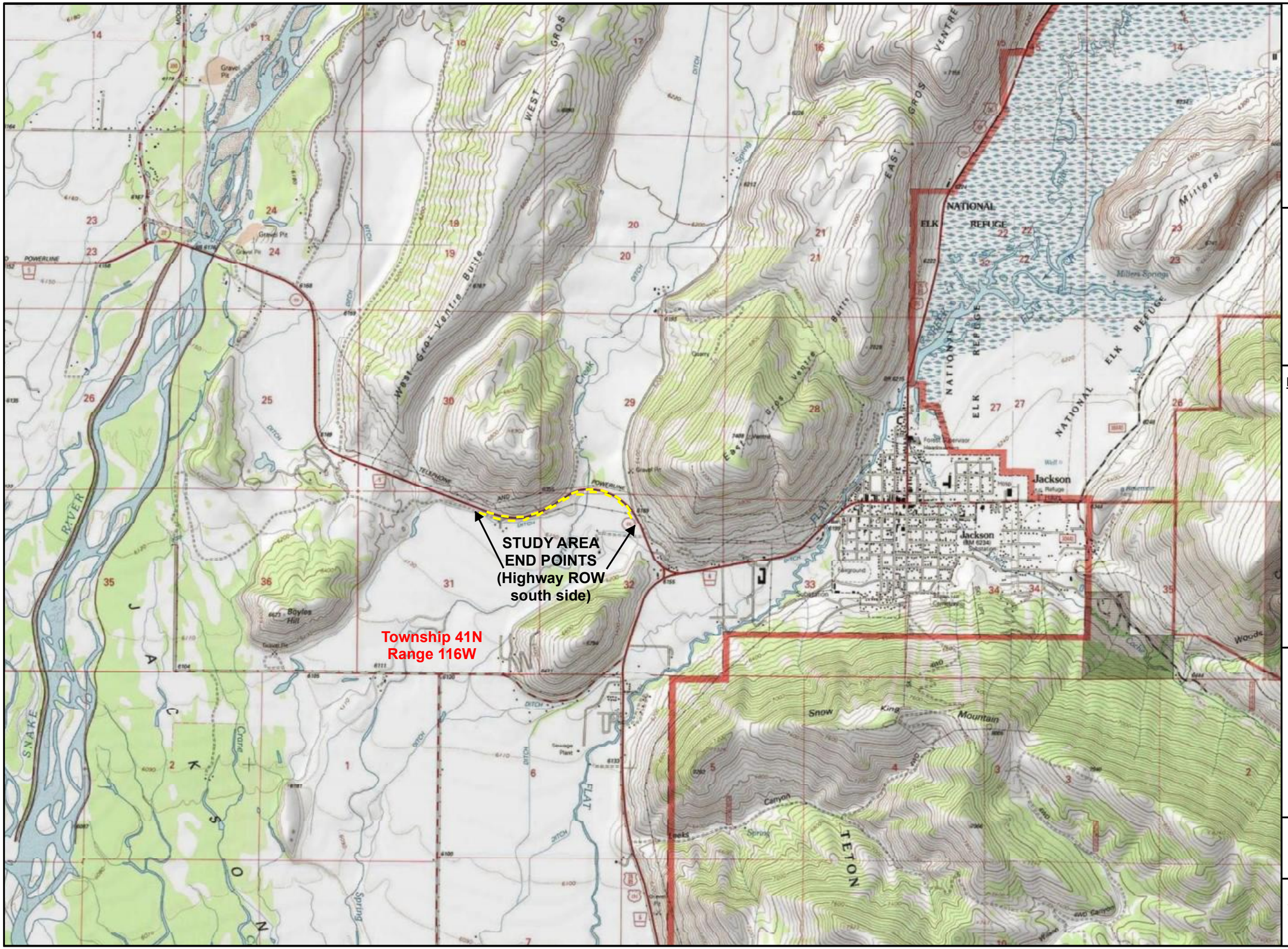
USFWS. 2012. National Wetlands Inventory GIS data layer. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. http://www.fws.gov/wetlands/

USGS. 2012. National Hydrography Dataset GIS data layer. U.S. Department of the Interior, United Geological Survey. http://nhd.usgs.gov. *Dataset* last modified on 11/5/2012.

APPENDIX A - MAPS

Figure 1. Location
Figure 2. Existing Site Information
Figure 3. Aquatic Resources
Figure 4. Vicinity



Aquatic Resources Inventory

JH Community Pathways

Pathway 22 East
State Highway 22
Teton County, WY

FIGURE 1:

Location

March 14, 2016

Description:

Landowners:
- State of Wyoming
- Pittsburgh National Bank, Trustee PNC Bank Co.
- Four Lazy F Ranch

WY Highway 22
Right-of-Way

NE1/4 Sec 31, NW1/4 Sec. 32, & SW1/4 Sec. 29
Township 41N, Range 116W

USGS Topographic 1:24,000 Map

1 inch = 0.5 miles

0 0.25 0.5 Miles

NORTH

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Aquatic Resources Inventory

JH Community Pathways

Pathway 22 East
State Highway 22
Teton County, WY

NE1/4 Sec 31, NW1/4 Sec. 32, & SW1/4 Sec. 29
Township 41N, Range 116W

FIGURE 2:

Existing Information

March 14, 2016

Legend:

- Study Area
- Parcel Boundary
- USFWS NWI
- USDA Soil Survey
- NHD Waterbody
- NHD Flowline

Teton County GIS:
Aerial Imagery taken June 13 & 14, 2015
Ownership Layer

USFWS NWI:
National Wetland Inventory

USDA Soil Survey:
Teton County, WY Grand Teton National Park Area

USGS NHD:
National Hydrography Dataset

1 inch = 350 feet

0 175 350 Feet

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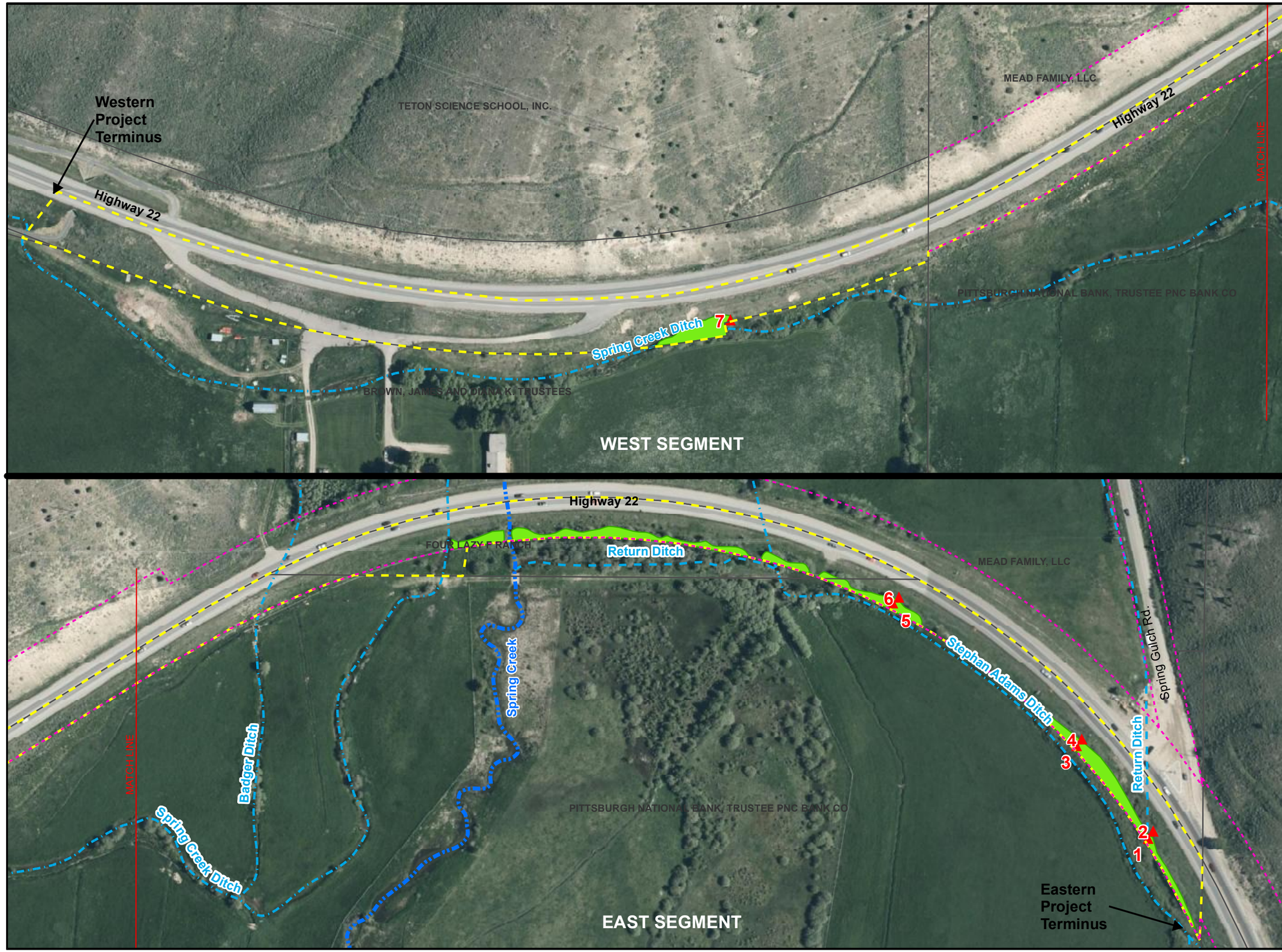

Aquatic Resources Inventory

JH Community Pathways

Pathway 22 East
State Highway 22
Teton County, WY

NE1/4 Sec 31, NW1/4 Sec. 32, & SW1/4 Sec. 29
Township 41N, Range 116W

FIGURE 3:

Aquatic Resources Inventoried

March 14, 2016

Legend:

- Study Area
- Parcel Boundary
- Highway Easement
- 1 Wetland Sample Points

Aquatic Resources

- Delineated Wetland
- Spring Creek
- Supply Ditch
- Return Ditch

Aerial Imagery:
June 13 & 14, 2015 Teton County GIS

Wetland Delineations:
March 5, 2015 & March 10, 2016
October 13, 2011

1 inch = 175 feet

0 87.5 175 Feet

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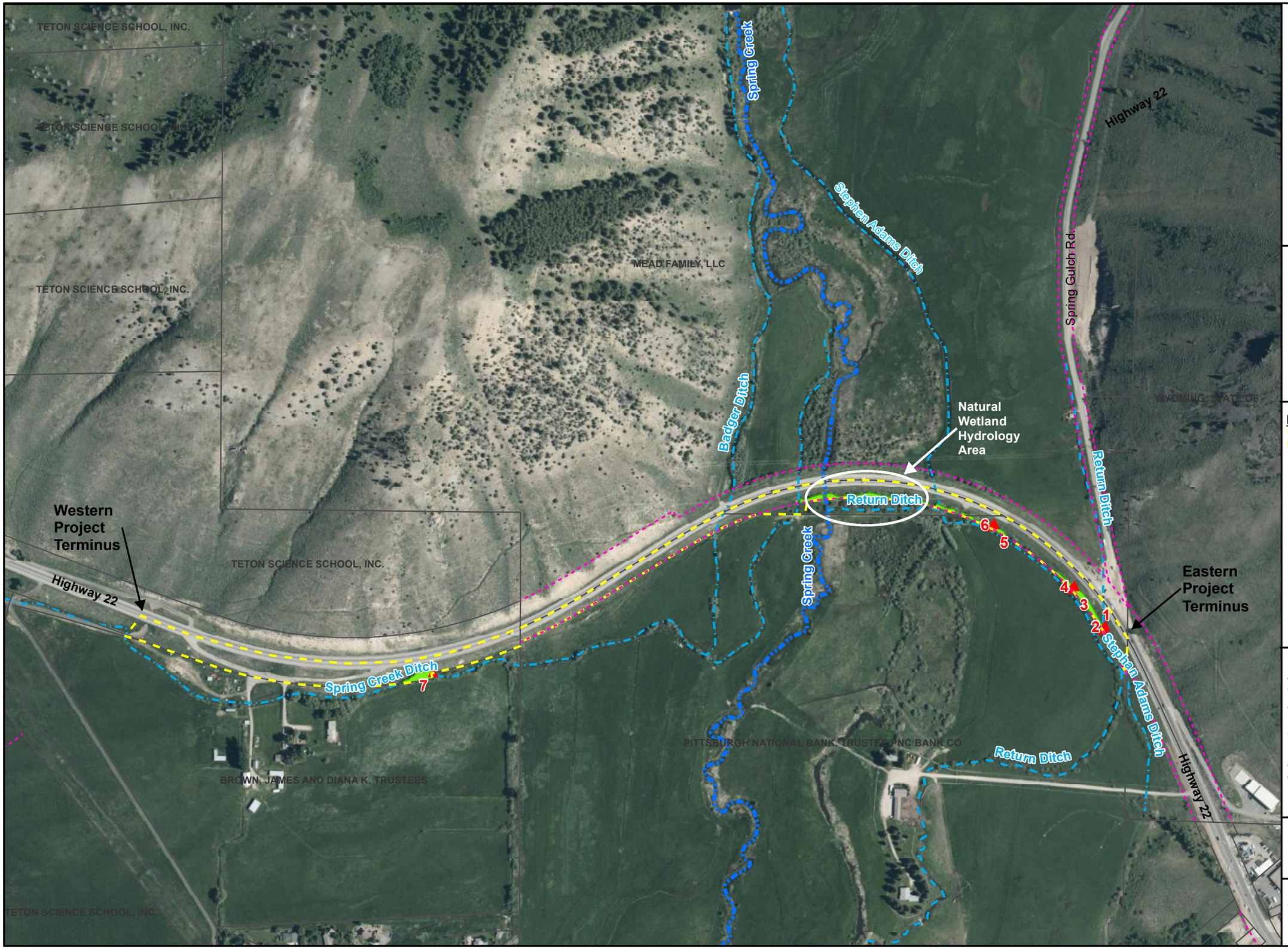

Aquatic Resources Inventory

JH Community Pathways

Pathway 22 East
State Highway 22
Teton County, WY

NE1/4 Sec 31, NW1/4 Sec. 32, & SW1/4 Sec. 29
Township 41N, Range 116W

FIGURE 4:

Vicinity

March 14, 2016

Legend:

- Study Area
- Parcel Boundary
- Highway Easement
- Wetland Sample Points

Aquatic Resources

- Delineated Wetland
- Spring Creek
- Supply Ditch
- Return Ditch

Aerial Imagery:
June 13 & 14, 2015 Teton County GIS

Wetland Delineations:
March 5, 2015 & March 10, 2016
October 13, 2011

Ditch Info:
WY State Engineers Office
Water Rights Database (online)

1 inch = 400 feet

0 200 400 Feet

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APPENDIX B – PHOTOS

Photo Number: 1

Date Taken: 03/05/2015

Description: Scrub-shrub wetland along fence line. Photo to east along HWY 22.

Photo Number: 2

Date Taken: 03/05/2015

Description: Spring Creek Ditch water flowing south under HWY 22. Photo to the Northeast.

Photo Number: 3

Date Taken: 03/05/2015

Description: Spring Creek flowing under HWY 22 surrounded by scrub-shrub wetlands. Photo to east.

Photo Number: 4

Date Taken: 03/05/2015

Description: Scrub-shrub wetland boundary along HWY 22. Photo to east.

Photo Number: 5

Date Taken: 03/05/2015

Description: Scrub-shrub wetland boundary along HWY 22. Photo to east.

Photo Number: 6

Date Taken: 10/13/2011

Description: SP-1
Scrub-shrub wetland

Photo Number: 7

Date Taken: 10/13/2011

Description: SP-1
Scrub-shrub wetland

Photo Number: 8

Date Taken: 10/13/2011

Description: SP-2
Upland

Photo Number: 9

Date Taken: 10/13/2011

Description: SP-2
Upland

Photo Number: 10

Date Taken: 10/13/2011

Description: SP-3
Scrub-shrub wetland

Photo Number: 11

Date Taken: 10/13/2011

Description: SP-3
Scrub-shrub wetland

Photo Number: 12

Date Taken: 10/13/2011

Description: SP-4
Upland

Photo Number: 13

Date Taken: 10/13/2011

Description: SP-4
Upland

Photo Number: 14

Date Taken: 3/10/2016

Description: SP-5
Scrub-shrub wetland

Photo Number: 15

Date Taken: 3/10/2016

Description: SP-5
Scrub-shrub wetland

Photo Number: 16

Date Taken: 3/10/2016

Description: SP-6
Upland

Photo Number: 17

Date Taken: 3/10/2016

Description: SP-6
Upland

Photo Number: 18

Date Taken: 3/10/2016

Description: SP-7
Scrub-shrub wetland

Photo Number: 19

Date Taken: 3/10/2016

Description: SP-7
Scrub-shrub wetland

Photo Number: 20

Date Taken: 3/10/2016

Description: Stephen Adams Ditch at culvert outlet south side of highway. Concrete headgate structure leads west.

Photo Number: 21

Date Taken:7/20/2015

Description: Pathway being constructed at Spring Gulch Road intersection. Silt fence running along wetland boundary. Wetlands have not changed since 2011 delineation.

APPENDIX C – WETLAND DETERMINATION DATA FORMS

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

Project Site: WY22-US189 Pathway East Seg. / Spring Gulch Intersection City/County: Jackson/Teton Sampling Date: 10-13-11

Applicant/Owner: Jackson/Teton County Pathways State: WY Sampling Point: SP1

Investigator(s): Brian Remlinger Section, Township, Range: 32, 41N, 116W

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave Slope (%): 0-1%

Subregion (LRR): Rocky Mountain Forests & Rangeland Lat: 43° 28' 43.277" Long: -110° 47' 33.815" Datum: NAD 83

Soil Map Unit Name: 25 - Leavitt Variant Loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	____	____
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' x 15')			
1. *Salix exigua*	50	yes	FACW
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
50% = 25, 20% = 10	50	= Total Cover	
Herb Stratum (Plot size: 5' x 5')			
1. *Carex utriculata*	50	yes	OBL
2. *Alopecurus pratensis*	20	yes	FAC
3. *Cirsium arvense*	5	no	FAC
4. *Carex spp.*	5	no	____
5. _____	_____	____	____
6. _____	_____	____	____
7. _____	_____	____	____
8. _____	_____	____	____
9. _____	_____	____	____
10. _____	_____	____	____
11. _____	_____	____	____
50% = 40, 20% = 16	80	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	____	____
2. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq$3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks:

Project Site: WY22-US189 Pathway East Seg. / Spring Gulch Intersection

SOIL

Sampling Point: SP1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	80					Loam	
4-8	10YR 5/1	70	2.5YR 4/6	3	C	PL	CL	
8-16	10YR 5/1	90	10YR5/1		D	M	SiC	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches): _____
Water Table Present?	Yes	☒	No	☐	Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches): 1

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Irrigation ditch to south sits high and leaks into project area. 2nd ditch crosses under road in culvert and daylights in project area. Both had flowing water during sample.

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

Project Site: WY22-US189 Pathway East Seg. / Spring Gulch Intersection City/County: Jackson/Teton Sampling Date: 10-13-11

Applicant/Owner: Jackson/Teton County Pathways State: WY Sampling Point: SP2

Investigator(s): Brian Remlinger Section, Township, Range: 32, 41N, 116W

Landform (hillslope, terrace, etc.): slope from road Local relief (concave, convex, none): concave Slope (%): 5%

Subregion (LRR): Rocky Mountain Forests & Rangeland Lat: 43° 28' 43.417" Long: -110° 47' 33.682" Datum: NAD 83

Soil Map Unit Name: 25 - Leavitt Variant Loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	____	____
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' x 15')			
1. *Salix exigua*	20	yes	FACW
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
50% = 10, 20% = 4	20	= Total Cover	
Herb Stratum (Plot size: 5' x 5')			
1. *Bromus inermis*	40	yes	FAC
2. *Cirsium arvense*	10	no	FAC
3. *Pascopyrum smithii*	10	no	FACU
4. _____	_____	____	____
5. _____	_____	____	____
6. _____	_____	____	____
7. _____	_____	____	____
8. _____	_____	____	____
9. _____	_____	____	____
10. _____	_____	____	____
11. _____	_____	____	____
50% = 30, 20% = 12	60	= Total Cover	
Woody Vine Stratum (Plot size: 5 x 5)			
1. *Ribes aureum*	10	yes	FAC
2. _____	_____	____	____
50% = 5, 20% = 2	10	= Total Cover	
% Bare Ground in Herb Stratum 10			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks:

Project Site: WY22-US189 Pathway East Seg. / Spring Gulch Intersection

SOIL

Sampling Point: SP2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 4/3	70					SiL	some gravel
5-12	10YR 4/3	50					grSiL	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches): _____
Water Table Present?	Yes	☐	No	☒	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

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

Project Site: WY22-US189 Pathway East Seg. / Spring Gulch Intersection City/County: Jackson/Teton Sampling Date: 10-13-11

Applicant/Owner: Jackson/Teton County Pathways State: WY Sampling Point: SP3

Investigator(s): Brian Remlinger Section, Township, Range: 32, 41N, 116W

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave Slope (%): 0-1%

Subregion (LRR): Rocky Mountain Forests & Rangeland Lat: 43° 28' 45.030" Long: -110° 47' 35.707" Datum: NAD 83

Soil Map Unit Name: 25 - Leavitt Variant Loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
50% = _____, 20% = _____	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' x 15')			
1. *Salix exigua*	70	yes	FACW
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
50% = 35, 20% = 14	70	= Total Cover	
Herb Stratum (Plot size: 5' x 5')			
1. *Phalaris arundinacea*	60	yes	FACW
2. *Carex utriculata*	10	no	OBL
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
50% = 35, 20% = 14	70	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
50% = _____, 20% = _____	_____	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq$3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks:

Project Site: WY22-US189 Pathway East Seg. / Spring Gulch Intersection

SOIL

Sampling Point: SP3

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	15	10YR6/2	10	D	M	CL	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	_____
Water Table Present?	Yes	☒	No	☐	Depth (inches):	8
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	6

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

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

Project Site: WY22-US189 Pathway East Seg. / Spring Gulch Intersection City/County: Jackson/Teton Sampling Date: 10-13-11

Applicant/Owner: Jackson/Teton County Pathways State: WY Sampling Point: SP4

Investigator(s): Brian Remlinger Section, Township, Range: 32, 41N, 116W

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave Slope (%): 3%

Subregion (LRR): Rocky Mountain Forests & Rangeland Lat: 43° 28' 45.154" Long: -110° 47' 35.561" Datum: NAD 83

Soil Map Unit Name: 25 - Leavitt Variant Loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
50% = _____, 20% = _____	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' x 15')			
1. *Salix exigua*	10	yes	FACW
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
50% = 5, 20% = 1	10	= Total Cover	
Herb Stratum (Plot size: 5' x 5')			
1. *Phalaris arundinacea*	10	no	FACW
2. *Pascopyrum smithii*	50	yes	FACU
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
50% = 30, 20% = 12	60	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
50% = _____, 20% = _____	_____	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤ 3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks: Salix (willow) shrub stratum canopy overhangs onto steep slope of highway shoulder. Roots of willows are growing in wetland at bottom of slope and not in this sample plot.

Project Site: WY22-US189 Pathway East Seg. / Spring Gulch Intersection

SOIL

Sampling Point: SP4

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	1-YR 4/3	60					grsi	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Soils appear to be homogeneous road base and shoulder fill.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches): _____
Water Table Present?	Yes	☐	No	☒	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

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

Project Site: WY 22 Pathway, west of Spring Gulch Road City/County: Jackson/Teton Sampling Date: 3-10-16

Applicant/Owner: Jackson/Teton County Pathways State: WY Sampling Point: SP-5

Investigator(s): Brian Remlinger Section, Township, Range: 29, 41N, 116W

Landform (hillslope, terrace, etc.): Ditch Local relief (concave, convex, none): concave Slope (%): 0-1%

Subregion (LRR): Rocky Mountain Forests & Rangeland Lat: 43° 28' 47.714" Long: -110° 47' 40.529" Datum: NAD 83

Soil Map Unit Name: 25 - Leavitt Variant Loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
50% = _____, 20% = _____	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' x 15')			
1. *Salix exigua*	70	yes	FACW
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
50% = 35, 20% = 14	70	= Total Cover	
Herb Stratum (Plot size: 5' x 5')			
1. *Phalaris arundinacea*	50	yes	FACW
2. *Carex utriculata*	10	no	OBL
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
50% = 30, 20% = 12	60	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
50% = _____, 20% = _____	_____	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	_____	x1 = _____
FACW species	_____	x2 = _____
FAC species	_____	x3 = _____
FACU species	_____	x4 = _____
UPL species	_____	x5 = _____
Column Totals:	_____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq$3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks:

Project Site: WY22 Path, west of Spring Gulch Road

SOIL

Sampling Point: SP-5

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	15	10YR6/2	10	D	M	CL	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches): _____
Water Table Present?	Yes	☐	No	☒	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

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

Project Site: WY 22 Pathway, west of Spring Gulch Road City/County: Jackson/Teton Sampling Date: 3-10-16

Applicant/Owner: Jackson/Teton County Pathways State: WY Sampling Point: SP-6

Investigator(s): Brian Remlinger Section, Township, Range: 29, 41N, 116W

Landform (hillslope, terrace, etc.): slope from road Local relief (concave, convex, none): concave Slope (%): 5%

Subregion (LRR): Rocky Mountain Forests & Rangeland Lat: 43° 28' 47.714" Long: -110° 47' 40.529" Datum: NAD 83

Soil Map Unit Name: 25 - Leavitt Variant Loam NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	____	____
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' x 15')			
1. *Salix exigua*	10	yes	FACW
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
50% = 5, 20% = 2.5	10	= Total Cover	
Herb Stratum (Plot size: 5' x 5')			
1. *Bromus inermis*	40	yes	FAC
2. *Cirsium arvense*	10	no	FAC
3. *Pascopyrum smithii*	10	no	FACU
4. _____	_____	____	____
5. _____	_____	____	____
6. _____	_____	____	____
7. _____	_____	____	____
8. _____	_____	____	____
9. _____	_____	____	____
10. _____	_____	____	____
11. _____	_____	____	____
50% = 30, 20% = 12	60	= Total Cover	
Woody Vine Stratum (Plot size: 5 x 5)			
1. *Ribes aureum*	10	yes	FAC
2. _____	_____	____	____
50% = 5, 20% = 2	10	= Total Cover	
% Bare Ground in Herb Stratum 10			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	_____	x1 = _____
FACW species	_____	x2 = _____
FAC species	_____	x3 = _____
FACU species	_____	x4 = _____
UPL species	_____	x5 = _____
Column Totals:	_____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq$3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks:

Project Site: WY22 Path, west of Spring Gulch Road

SOIL

Sampling Point: SP-6

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 4/3	70					SiL	some gravel
5-12	10YR 4/3	50					grSiL	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Highway fill material/ side slope

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches): _____
Water Table Present?	Yes	☐	No	☒	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

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

Project Site: WY 22 Pathway, west of Spring Gulch Road City/County: Jackson/Teton Sampling Date: 3-10-16

Applicant/Owner: Jackson/Teton County Pathways State: WY Sampling Point: SP-7

Investigator(s): Brian Remlinger Section, Township, Range: 32, 41N, 116W

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave Slope (%): 0-1%

Subregion (LRR): Rocky Mountain Forests & Rangeland Lat: 43° 28' 40.968" N Long: 110° 48' 14.639" W Datum: NAD 83

Soil Map Unit Name: 21 - Grobutte-Thayne gravelly loams, 30 NWI classification: None

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	____	____
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' x 15')			
1. *Salix exigua*	50	yes	FACW
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
50% = 25, 20% = 10	50	= Total Cover	
Herb Stratum (Plot size: 5' x 5')			
1. *Carex utriculata*	50	yes	OBL
2. *Bromus inermis*	20	yes	FAC
3. *Cirsium arvense*	5	no	FAC
4. *Carex spp.*	5	no	____
5. _____	_____	____	____
6. _____	_____	____	____
7. _____	_____	____	____
8. _____	_____	____	____
9. _____	_____	____	____
10. _____	_____	____	____
11. _____	_____	____	____
50% = 40, 20% = 16	80	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	____	____
2. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	
% Bare Ground in Herb Stratum 0			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is $\leq$3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks:

Project Site: WY22-US189 Pathway East Seg. / Spring Gulch Intersection

SOIL

Sampling Point: SP-7

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	80					Loam	
4-8	10YR 5/1	70	2.5YR 4/6	3	C	PL	CL	
8-16	10YR 5/1	90	10YR5/1		D	M	SiC	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches): _____
Water Table Present?	Yes	☐	No	☒	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches): _____

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Irrigation ditch to south sits high and leaks into project area..

APPENDIX D – SOIL SURVEY REPORT

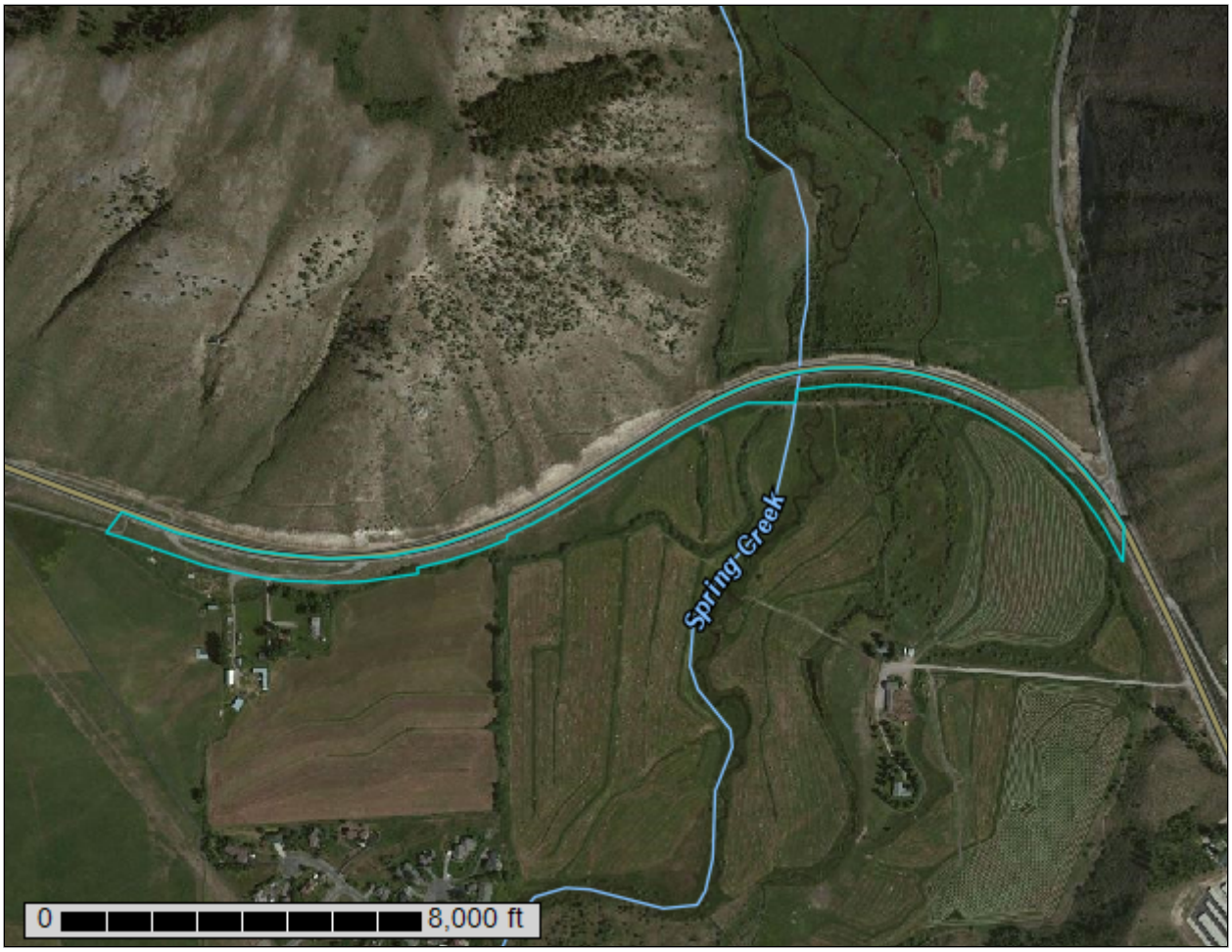
United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

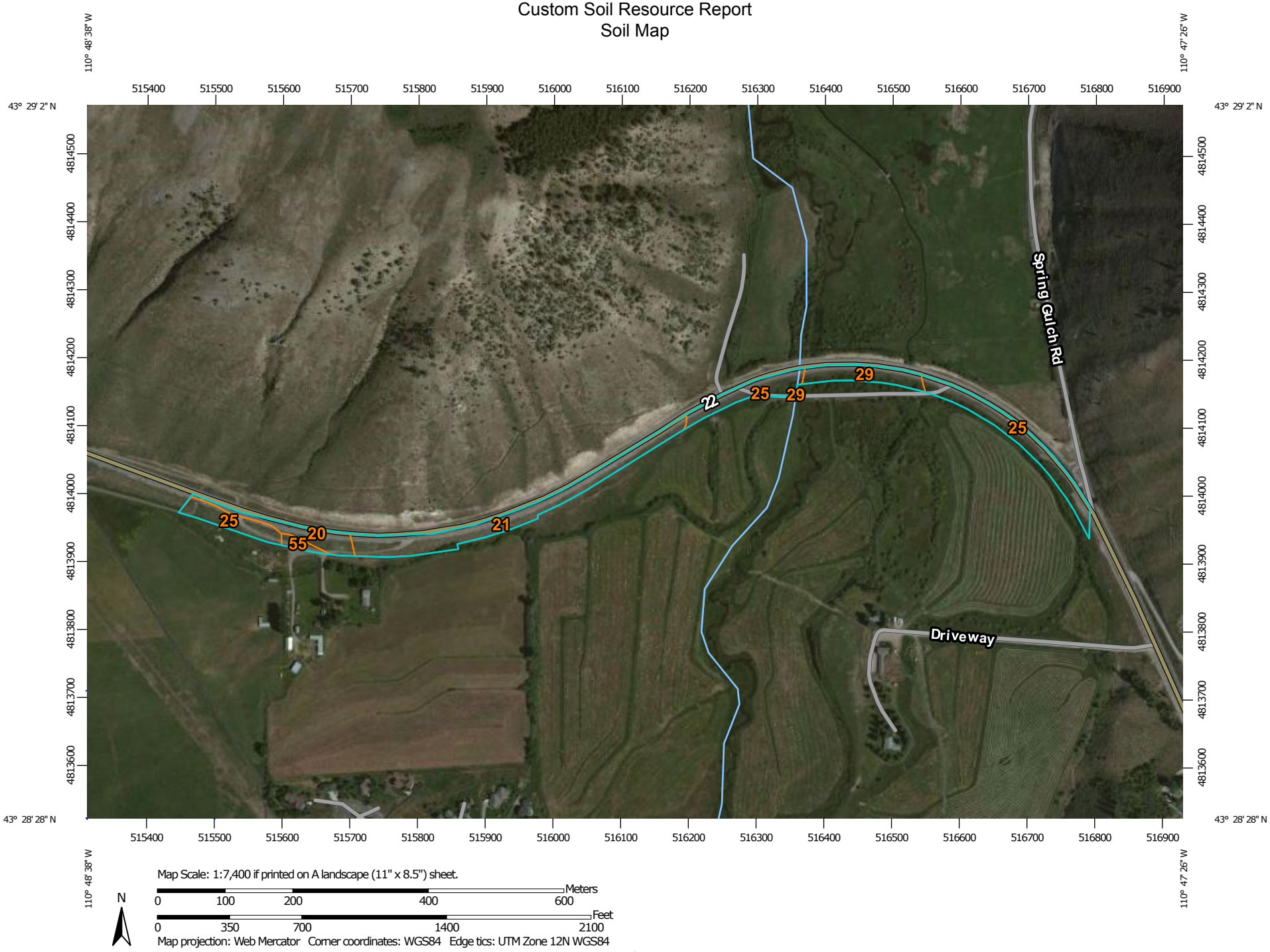
Custom Soil Resource Report for Teton County, Wyoming, Grand Teton National Park Area

WY 22 Pathway



March 10, 2016

Custom Soil Resource Report
Soil Map



Map Scale: 1:7,400 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 350 700 1400 2100

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)

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Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Teton County, Wyoming, Grand Teton National Park Area
Survey Area Data: Version 10, Sep 22, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 20, 2011—Aug 19, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Teton County, Wyoming, Grand Teton National Park Area (WY666)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
20	Greyback-Thayne complex, 20 to 30 percent slopes *	0.9	10.0%
21	Grobutte-Thayne gravelly loams, 30 to 60 percent slopes *	3.0	32.9%
25	Leavitt variant loam	3.9	43.1%
29	Newfork fine sandy loam	1.0	11.6%
55	Tetonville gravelly loam	0.2	2.3%
Totals for Area of Interest		**9.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Teton County, Wyoming, Grand Teton National Park Area

20—Greyback-Thayne complex, 20 to 30 percent slopes *

Map Unit Setting

National map unit symbol: 54h4
Elevation: 5,300 to 7,500 feet
Mean annual precipitation: 13 to 21 inches
Mean annual air temperature: 30 to 45 degrees F
Frost-free period: 60 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Greyback and similar soils: 60 percent
Tetonia and similar soils: 15 percent
Thayne and similar soils: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Greyback

Setting

Landform: Mountain slopes
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock and/or glaciofluvial deposits derived from igneous, metamorphic and sedimentary rock

Typical profile

A - 0 to 5 inches: gravelly loam
Bw - 5 to 13 inches: gravelly loam
Ck - 13 to 30 inches: very gravelly sandy loam
C2 - 30 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 20 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B

Ecological site: GRAVELLY (15-19W) (R043XY212WY)

Description of Thayne

Setting

Landform: Mountain slopes
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

A - 0 to 6 inches: gravelly loam
Bw - 6 to 34 inches: gravelly loam
Ck - 34 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 20 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 12 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: LOAMY (15-19W) (R043XY222WY)

Description of Tetonia

Setting

Landform: Mountain slopes
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loess

Typical profile

A - 0 to 8 inches: silt loam
Bw - 8 to 30 inches: silt loam
Bk - 30 to 60 inches: silt loam

Properties and qualities

Slope: 20 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 12.0 inches)

Interpretive groups
Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: LOAMY (15-19W) (R043XY222WY)

Minor Components

Crow creek
Percent of map unit: 2 percent

Lantonia
Percent of map unit: 2 percent

Robana
Percent of map unit: 2 percent

Willow creek
Percent of map unit: 2 percent

Unnamed 1
Percent of map unit: 1 percent

Unnamed 2
Percent of map unit: 1 percent

21—Grobutte-Thayne gravelly loams, 30 to 60 percent slopes *

Map Unit Setting
National map unit symbol: 54h5
Elevation: 5,700 to 7,500 feet
Mean annual precipitation: 15 to 21 inches
Mean annual air temperature: 30 to 45 degrees F
Frost-free period: 60 to 105 days
Farmland classification: Not prime farmland

Map Unit Composition
Grobutte and similar soils: 50 percent
Greyback and similar soils: 20 percent
Thayne and similar soils: 20 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grobutte

Setting

Landform: Mountains
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock and/or colluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

A - 0 to 4 inches: gravelly loam
C1 - 4 to 10 inches: gravelly loam
C2 - 10 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 30 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 5 percent
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: STEEP STONY (15-19W) (R043XY270WY)

Description of Thayne

Setting

Landform: Mountain slopes
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

A - 0 to 6 inches: gravelly loam
Bw - 6 to 34 inches: gravelly loam
Ck - 34 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 30 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum in profile: 12 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: LOAMY (15-19W) (R043XY222WY)

Description of Greyback

Setting

Landform: Mountain slopes
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock and/or glaciofluvial deposits derived from igneous, metamorphic and sedimentary rock

Typical profile

A - 0 to 5 inches: gravelly loam
Bw - 5 to 13 inches: gravelly loam
Ck - 13 to 30 inches: very gravelly sandy loam
C2 - 30 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 30 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: STEEP STONY (15-19W) (R043XY270WY)

Minor Components

Crow creek

Percent of map unit: 5 percent

Rock outcrop

Percent of map unit: 5 percent

25—Leavitt variant loam

Map Unit Setting

National map unit symbol: 54h9
Elevation: 6,000 to 9,000 feet
Mean annual precipitation: 20 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 60 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Leavitt variant and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leavitt Variant

Setting

Landform: Mountain slopes
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

A - 0 to 7 inches: loam
Bt - 7 to 38 inches: clay loam
Bk - 38 to 52 inches: sandy clay loam
2C - 52 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): 4w

Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C
Ecological site: SUBIRRIGATED (15-19W) (R043XY274WY)

Minor Components

Charlos variant
Percent of map unit: 5 percent

Unnamed 1
Percent of map unit: 5 percent

Unnamed 2
Percent of map unit: 5 percent

29—Newfork fine sandy loam

Map Unit Setting
National map unit symbol: 54hf
Elevation: 5,500 to 10,500 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 36 to 37 degrees F
Frost-free period: 60 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition
Newfork and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Newfork

Setting
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile
A - 0 to 10 inches: gravelly fine sandy loam
Bg - 10 to 16 inches: gravelly fine sandy loam
2C - 16 to 60 inches: very gravelly loamy sand

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 6 to 48 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): 5w
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B
Ecological site: WETLAND (15-19W) (R043XY278WY)

Minor Components

Tetonville

Percent of map unit: 8 percent

Wilsonville

Percent of map unit: 7 percent

55—Tetonville gravelly loam

Map Unit Setting

National map unit symbol: 54jc
Elevation: 6,000 to 7,000 feet
Mean annual precipitation: 15 to 21 inches
Mean annual air temperature: 37 to 39 degrees F
Frost-free period: 60 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Tetonville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tetonville

Setting

Landform: Mountain valleys
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

A - 0 to 17 inches: gravelly loam
C2 - 17 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent

Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C
Ecological site: SUBIRRIGATED (15-19W) (R043XY274WY)

Minor Components

Newfork

Percent of map unit: 8 percent
Landform: Flood plains

Tetonville

Percent of map unit: 7 percent