MORRISON MAIERLE, INC.
An Employee-Owned Company

BRIDGER BOWL BASE AREA WETLAND DELINEATION REPORT

August 2006

Prepared For

Bridger Canyon Partners, L.L.C.
P.O. Box 7078
Bozeman, MT 59771

Prepared By

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JB 4,202

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
BILLINGS REGULATORY OFFICE
2602 FIRST AVENUE NORTH, ROOM 309
BILLINGS MT 59101

FILE COPY

Reply to the attention of:

October 17, 2006

Billings Regulatory Office
Phone (406) 657-5910
Fax (406) 657-5911

RE: Jurisdictional Determination – Bridger Bowl Base Area
Corps File No. 2006-90-721
MMI # 4150.002

Mr. Steve M. Laufenberg
Morrison Maierle, Inc.
Post Office Box 1113
Bozeman, Montana 59771

Dear Mr. Laufenberg:

Reference is made to a Wetland Delineation Report submitted in support of a proposed development project located northeast of Bozeman, Montana. The 350 acre project area is located in Sections 19, 20, 29, and 30, Township 1 North, Range 7 East, in Gallatin County, Montana.

Under the authority of Section 404 of the Clean Water Act, Department of the Army permits are required for the discharge of fill material into waters of the United States. Waters of the United States include the area below the ordinary high water mark of stream channels and lakes or ponds connected to the tributary system, and wetlands adjacent to these waters.

Based on the information you provided, and a subsequent field visit conducted by Shannon Johnson on October 11, 2006, none of the following sites are located within jurisdictional waters of the U. S. under the authority of Section 404 of the Clean Water Act: W-1-06, W-2-06, W-3-06, W-4-06, W-7-06, W-8-06, W-9-06, W-11-06, W-13-06, W-14-06, W-15-06, W-17-06, W-18-06, W-20-06, W-22-06, W-26-06, W-27-06, W-28-06, W-30-06, W-33-06, W-34-06, W-35-06 and W-36-06.

The following sites are located within jurisdictional waters of the U. S. under the authority of Section 404 of the Clean Water Act: W-5-06, W-6-06, W-10-06, W-12-06, W-19-06, W-21-06, W-23-06, W-24-06, W-29-06, W-31-06, W-32-06 and W-37-06.

These are Approved Jurisdictional Determinations, and they are valid for a period of 5 years from the date of this letter unless new information warrants revision of the determination before the expiration date. If you disagree with this jurisdictional determination, you have the right to appeal the decision. If you would like more information on the jurisdictional appeal process, contact this office.

If you have any questions, please call Shannon Johnson of the Billings office at (406) 657-5910, and reference File No. 200690721.

upland (FACU), or upland (UPL). If a species does not have an indicator status due to insufficient information available to determine an indicator status, a no indictor (NI) designation is utilized. If a species has not been reviewed and given an indicator status, a no status indicator (NS) is utilized. Species with an indicator status of OBL, FACW, or FAC are considered adapted for life in saturated or anaerobic soil conditions. A sample plot is considered to meet the hydrophytic vegetation criterion if more than 50 percent of dominant species present have an indicator status of OBL, FACW, or FAC. A positive sign (+) following a regional indicator specifies a frequency toward the higher end of a category (more frequently found in wetlands), and a negative sign (-) indicates a frequency toward the lower end of a category (less frequently in wetlands). An asterisk (*) following a regional indicator identifies tentative assignments based on limited information from which to determine the indicator status.

Hydric Soils

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile (Wetland Training Institute 2001). Soil is saturated when all voids (pores) between soil particles are filled with water.

Hydric soils exhibit certain physical characteristics that can be observed in the field. These characteristics, or indicators, include high organic content, accumulation of sulfides, greenish or bluish gray color (gley formation), mottling, and dark soil colors (low soil chroma). Organic content is estimated visually and texturally, sulfidic material is determined by the odor of sulfide gases, and soil colors are determined by using *Munsell Soil Color Charts* (Munsell Color 2000). A sample plot is considered to meet the hydric soil criterion if one or more of the accepted hydric soil indicators are present.

Wetland Hydrology

The technical guidelines for the wetland hydrology parameter have been established as soils that are periodically inundated or saturated in the upper 12 inches for a minimum of 5 percent of the growing season (Wetland Training Institute 2001). Wetland hydrology may be supplied by surface water, groundwater, and/or direct precipitation. Sites are examined for visual indicators of wetland hydrology such as current ponding or soil saturation, previous inundation or saturation, and observable drainage patterns. A sample plot is considered to meet the wetland hydrology criterion if at least one primary indicator or two secondary indicators are present.

3.2.2 Non-Wetland /Waterways

Non-wetland waterways are currently defined by the USACE as having either perennial or intermittent flow as evidenced by the presence of a defined channel with bed and bank, or a streambed dominated by hydrophytic vegetation. These non-wetland waterways may be considered isolated or jurisdictional depending on adjacency to or the existence of a surface hydrologic connection to a known waters of the U.S.

of an on-site inspection using the Routine Level 2 Determination Method outlined in the *1987 USACE Wetlands Delineation Manual* (Environmental Laboratory 1987).

3.1 OFF-SITE REVIEW

A preliminary off-site review of a variety of source documents was completed to identify potential wetland areas and waterways. The source documents used for this review included: the U.S. Geological Survey (USGS) 1987 Saddle Peak, Montana 7.5' Topographic Map (USGS 1987), provided as Figure 1; a privately flown orthographic aerial photograph of the subject property (Map Inc. 2006), provided as Figure 2; a portion of the U.S. Department of Agriculture *2002 Soil Survey of Gallatin County, Montana* (USDA 2002), provided as Figure 3; and the U.S. Fish and Wildlife Service (USFWS) *National Wetland Inventory Map* (NWI). NWI mapping has not been completed for the project area and was therefore unavailable for review.

3.2 ON-SITE REVIEW

Using the Routine Level 2 Determination Method, wetlands were identified on-site as areas that met the standard criteria for hydrophytic vegetation, hydric soils, and wetland hydrology. The wetland criteria for each of the above three parameters is discussed in detail in Section 3.2.1. Based on this method, these three parameters were evaluated at sample points (S) along linear transects to determine the boundary between upland and wetland areas. If all three parameters at a sample point exhibited positive wetland indicators, a positive wetland determination was made for the area represented by the sample point. If any one of the three parameters at a sample point failed to exhibit positive wetland indicators, the area was determined to be non-wetland, as specified in the 1987 USACE Wetlands Delineation Manual. Areas that were determined to be wetland (W) were marked with pin flags, documented, surveyed, and mapped. The locations of wetlands are provided on Figure 4, Wetland Delineation Map. Waterways that exhibited bed and bank characteristics were delineated at the OHW boundary with flags, documented, surveyed, and mapped. The locations of the delineated waterways are also provided on Figure 4, Wetland Delineation Map.

3.2.1 Hydrophytic Vegetation, Hydric Soils, and Wetland Hydrology

The following is a discussion of the wetland indicators for each of the three parameters (vegetation, soils, and hydrology) examined in the field when utilizing the Routine Level 2 Determination Method. Under most circumstances, a positive wetland indicator must be identified for each of the three parameters in order for an area to be determined as wetland.

Hydrophytic Vegetation

Plants must be physiologically or morphologically adapted for life under saturated or anaerobic soil conditions to grow in wetlands. The USACE and the U.S. Fish and Wildlife Service have determined the estimated probability of each plant species occurrence in wetlands and have assigned an "indicator" status to each species to reflect their findings. Accordingly, plants may be categorized as obligate (OBL), facultative wetland (FACW), facultative (FAC), facultative

Table 1 Wetland Numbers, Types, Area, and Observed Jurisdictional Status (continued)

WETLAND #	WETLAND TYPE	WETLAND AREA (acre)	OBSERVED JURISDICTIONAL STATUS
W-13-06	Slope	0.201	No
W-14-06	Slope	0.015	No
W-15-06	Slope	0.006	No
W-17-06	Slope	0.066	No
W-18-06	Slope	0.015	No
W-19-06	Slope/Riverine	7.092	Yes
W-20-06	Slope	0.008	No
W-21-06	Slope	0.024	Yes
W-22-06	Slope	0.003	No
W-23-06	Riverine	5.167	Yes
W-24-06	Riverine	0.034	Yes
W-26-06	Slope	0.296	No
W-27-06	Depressional	0.009	No
W-28-06	Slope	0.119	No
W-29-06	Slope/Riverine	0.325	Yes
W-30-06	Slope	0.039	No
W-31-06	Riverine	2.962	Yes
W-32-06	Slope	0.198	Yes
W-33-06	Slope	0.602	No
W-34-06	Slope	0.322	No
W-35-06	Slope	0.162	No
W-36-06	Slope	0.042	No
W-37-06	Slope/Riverine	0.456	Yes

Slope Wetlands

Slope wetlands include wetlands that are typically associated with groundwater seepage. This seepage usually persists and saturates the soil throughout the growing season but typically does not form a defined channel.

Twenty-two slope wetlands were delineated within the project area. Twenty slope wetlands were isolated and preliminarily observed to be non-jurisdictional. Two slope wetlands were observed to be likely jurisdictional based on their proximity to waterways. Wetland W-18-06 is a typical slope wetland within the project area and is located in the northwest portion of the project site. The hydrology indicators are inundated soils, saturation in the upper 12 inches, drainage patterns in the wetland, and a positive FAC-Neutral test. The hydric soil indicators are low chroma color (10YR 3/1) with mottles (10YR 5/6), and sulfidic odor. The dominant wetland vegetation includes beaked sedge (*Carex utriculata*, OBL), arrow-leaf groundsel (FACW+), field horsetail (FAC), large-leaf avens (FACW-), green alder (*Alnus crispa*, FACW*), leafy-white orchid (*Platanthera dilatata*, FACW+), and hairy willow-herb (FACW-). The wetland/upland

percent slopes (79C); Yellowmule-Lonniebee, stony-Redlodge complex 4 to 15 percent slopes (294D); Yellowmule-Lonniebee, stony complex 15 to 45 percent slopes (294E); Yellowmule-Ouselfal complex 8 to 25 percent slopes (492E); Bridger-Redlodge complex 4 to 25 percent slopes (550E); Beehive-Mooseflat complex 0 to 4 percent slopes (608B); Bangtail-Copenhaver complex 8 to 25 percent slopes (679E); Danahar, stony-Loberg, very stony complex 8 to 15 percent slopes (792D); Mollic Cryoboralfs-Argric Cryoborolls association, structurally controlled slopes, 10 to 20 percent slopes (84-2B); and Typic Cryoboralfs-Mollic Cryoboralfs complex, structurally controlled slopes,warm, 10 to 30 percent slopes (86-3B). The locations of the soil map units identified within the project area are provided as Figure 3. Five percent of the Yellowmule-Lonniebee, stony-Redlodge complex soil unit, 5 percent of the Yellowmule-Lonniebee, stony complex soil unit, 1 percent of the Bangtail-Bridger complex soil unit, 15 percent of the Bridger-Redlodge complex soil unit, 32 percent of the Beehive-Mooseflat complex, and 1 percent of the Danahar, stony-Loberg very stony complex soil unit are considered to be hydric soil units. The available soils information was not of sufficient detail to aid in the analysis of on-site hydric soils.

4.2 ON-SITE REVIEW

A map of the delineated wetland boundaries located within the project area has been provided as Figure 4. A total of 35 wetlands were identified and delineated within the investigation area. Delineated wetlands were numbered from W-1-06 to W-37-06; however, wetland numbers W-16-06 and W-25-06 were not used. Utilizing the HGM classification system, 22 slope wetlands, five riverine wetlands, one depressional wetland, six slope/riverine wetlands, and one slope/depressional wetland were identified within the project area. The following wetland descriptions reflect representative areas for all wetlands within the wetland type at the time of delineation. Table 1 describes the wetland number, type, area, and observed jurisdictional status of each wetland delineated within the project area. Corresponding data forms are provided in Appendix A and corresponding photographs are provided in Appendix B.

Table 1 Wetland Numbers, Types, Area, and Observed Jurisdictional Status

WETLAND	WETLAND TYPE	WETLAND AREA (acre)	OBSERVED JURISDICTIONAL STATUS
W-1-06	Slope	0.014	No
W-2-06	Slope	0.037	No
W-3-06	Slope/Depressional	0.175	No
W-4-06	Slope	0.003	No
W-5-06	Slope/Riverine	0.706	Yes
W-6-06	Slope/Riverine	0.830	Yes
W-7-06	Slope	0.093	No
W-8-06	Slope/Riverine	0.030	No
W-9-06	Slope	0.020	No
W-10-06	Riverine	1.086	Yes
W-11-06	Slope	0.052	No
W-12-06	Riverine	1.598	Yes

EXECUTVE SUMMARY

At the request of Bridger Canyon Partners, L.L.C., the Bridger Bowl Base Area property was examined for the presence and extent of wetlands and waterways by Morrison-Maierle, Inc., Environmental Services Group on June 19 through 23, June 26 through 30, and July 5 and 6, 2006. The Bridger Bowl Base Area project site is an approximately 350-acre area, located in Sections 19, 20, 29, and 30, Township 1 North, Range 7 East, P.M.M., Gallatin County, Montana.

Historical land use on the subject property has consisted primarily of timber harvest and recreation. Existing conditions on site include steep forested terrain with several open alpine meadows, wetland areas, and drainages. Thirty-five wetlands were delineated within the 350-acre investigation area. Eight perennial drainages were delineated at the ordinary high watermark (OHW) and associated wetland fringe. The OHW was delineated for waterways that exhibited bed and bank characteristics. Bridger Creek is the major drainage within the project area, with Maynard Creek and six unnamed drainages as tributaries to Bridger Creek. The dominant vegetation in the forested areas includes Douglas fir (*Pseudotsuga menziesii*), sub-alpine fir (*Abies lasiocarpa*), lodge-pole pine (*Pinus contorta*), and spruce spescies (*Picea spp.*). The dominant vegetation in the open meadows and drainages includes Nebraska sedge (*Carex nebrascensis*), arrow-leaf groundsel (*Senecio triangularis*), large-leaf avens (*Geum macrophyllum*), field horsetail (*Equisetum arvense*), willow species (*Salix spp.*), common yarrow (*Achillea millefolium*), Richardson's cranes-bill (*Geranium richardsonii*), Canada thistle (*Cirsium arvense*), and other herbaceous plants.

Utilizing the Hydrogeomorphic Classification System, 22 slope wetlands, five riverine wetlands, one depressional wetland, six slope/riverine wetlands, and one slope/depressional wetland were identified and delineated throughout the project area. The total area of the 35 delineated wetlands on the property is approximately 22.95 acres. Twelve wetlands were preliminarily observed to be jurisdictional based on their apparent surface hydrologic connectivity to a known waters of the U.S. Final jurisdictional status for all delineated wetlands located within the project area will be provided by the U.S. Army Corps of Engineers.

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

At the request of Bridger Canyon Partners, L.L.C., the Bridger Bowl Base Area property was examined for the presence and extent of wetlands and waterways by Morrison-Maierle, Inc., Environmental Services Group (MMI) on June 19 through 23, June 26 through 30, and July 5 and 6, 2006. The Bridger Bowl Base Area project site is an approximately 350-acre area, located in Sections 19, 20, 29, and 30, Township 1 North, Range 7 East, P.M.M., Gallatin County, Montana.

Historical land use on the subject property has consisted primarily of timber harvest and recreation. Existing conditions on site include steep forested terrain with several open alpine meadows, wetland areas, and drainages. Thirty-five wetlands were delineated within the investigation area. Twenty-two slope wetlands, five riverine wetlands, one depressional wetland, six slope/riverine wetlands, and one slope/depressional wetland were identified and delineated throughout the 350-acre project area. Eight perennial drainages were delineated at the ordinary high watermark (OHW) and associated wetland fringe. The OHW was delineated for waterways that exhibited bed and bank characteristics. Bridger Creek is the major drainage within the project area, with Maynard Creek and six unnamed drainages as tributaries to Bridger Creek. The dominant vegetation in the forested areas includes Douglas fir (*Pseudotsuga menziesii*), sub-alpine fir (*Abies lasiocarpa*), lodge-pole pine (*Pinus contorta*), and spruce spescies (*Picea spp.*). The dominant vegetation in the open meadows and drainages includes Nebraska sedge (*Carex nebrascensis*), arrow-leaf groundsel (*Senecio triangularis*), large-leaf avens (*Geum macrophyllum*), field horsetail (*Equisetum arvense*), willow species (*Salix spp.*), common yarrow (*Achillea millefolium*), Richardson's cranes-bill (*Geranium richardsonii*), Canada thistle (*Cirsium arvense*), and other herbaceous plants.

2.0 OBJECTIVES

The purpose of this study was to locate areas that meet the criteria for wetlands and non-wetland waterways within the Project investigation area, delineate their boundaries, and provide the results in a final report. A second objective was to provide observations as to the jurisdictional status of the delineated wetlands and non-wetland waterways based on their connection or adjacency to a known waters of the U.S.

The jurisdictional observations made during the course of the delineation effort are considered preliminary and are based on conditions observed in the field or during the off-site review, as well as interpretation of current regulatory guidelines. Final jurisdictional status will require concurrence from the U.S. Army Corps of Engineers (USACE). Jurisdictional determination criteria are discussed in more detail in Section 3.2.3.

3.0 METHODS

The wetland delineation for this project was based on the methodology developed by the USACE and other federal agencies, for implementation of Section 404 of the Clean Water Act. The investigation consisted of an off-site review of existing site-specific information and completion

3.2.3 Jurisdictional Determination

The observed jurisdictional status of wetlands was determined through visual documentation of a surface hydrologic connection to a known waters of the U.S. Final jurisdictional status for all wetlands and waterways located within the project area will be provided by the USACE.

3.2.4 Data Collection

Vegetation, soils, and hydrology were documented at representative locations along the wetland-upland boundary. Data were recorded for at least one sample point on both the upland and wetland sides of the wetland boundary along a linear transect. Copies of data sheets are provided in Appendix A. Sample points were documented and photographs taken of each sample point were also documented. Photographs and their descriptions are provided in Appendix B. The following is the sampling, data collection, and data recording methodology for each of the three wetland parameters (vegetation, soils, and hydrology) as well as for photograph and sample point documentation.

Vegetation Data

At each sample point, plant species dominance was estimated based on the percent aerial or basal coverage within a 30-foot radius for the tree and shrub layers and a 5-foot radius for the herbaceous layer within the community type being sampled. Plants were identified using standard regional plant keys. Taxonomy was based on *Vascular Plants of Montana* (Dorn 1984). Indicator status of plant species was taken from the *National List of Plant Species That Occur in Wetlands for Region 9-Northwest* (Resource Management Group 1993) and the *1993 Supplement to the List of Plant Species that Occur in Wetlands: Northwest (Region 9)* (Reed 1993).

Soil Data

At each sample point, soils were characterized to a minimum depth of 16 inches when possible. *Munsell Soil Color Charts* and standard soil texturing methodology were used to describe the soil profile.

Hydrology Data

At each sample point, hydrology was typically determined based on factors such soil saturation in the upper 12 inches, sediment deposits, or observable drainage patterns within the wetland. However, in cases where primary indicators were not readily visible, the determination was based on secondary factors such as oxidized root channels, topographic position, or other factors that would indicate the existence of sufficient wetland hydrology during the growing season.

Photograph and Sample Data Point Documentation

Sample points were marked in the field with pin flags. Each sample point was then assigned a number that corresponded to the wetland being documented, and this number was written on a

sample point flag. Photographs were taken at each representative sample point with the location and a description of the scene recorded on a field photolog sheet. Photographs are provided in Appendix B.

3.3 WETLAND CLASSIFICATION

Wetlands were classified using the Hydrogeomorphic (HGM) classification system. This system classifies Montana wetlands as riverine, slope, depressional, mud flats, or lacustrine (Berglund 1999). A brief description of each wetland type is presented below.

- **Riverine** wetlands include wetlands associated with waterway/drainage systems. These can be perennial or intermittent streams or rivers and/or their immediately adjacent wetlands.

- **Slope** wetlands include wetlands that are typically associated with groundwater seepage. This seepage usually persists and saturates the soil throughout the growing season but typically does not form a defined channel. Seepage slopes may convey water to a waters of the U.S. and therefore, would be considered jurisdictional. However, water in these wetlands may influence only a limited area and are often isolated and therefore, would be considered non-jurisdictional.

- **Depressional** wetlands include wetlands that typically form in isolated depressions such as glacial potholes. Hydrology for these wetlands may either be supplied by groundwater seepage or surface water from the surrounding watershed. Typically, these wetlands have no definable inlet or outlet.

- **Mud flats** include both mineral flats such as playas and organic flats such as expansive peat lands.

- **Lacustrine** wetlands include both wetlands immediately adjacent to large water bodies as well as the water body itself. In order to qualify as a lacustrine wetland, the water body must exceed 2 meters in depth, or the wetland is classified as depressional.

3.4 DRAINAGE CHARACTERISTICS

Perennial drainages, or streams, flow continuously and they are generally fed in part by springs. Surface water elevations are commonly lower than the water table elevation in adjacent soils (Hansen et al. 1995). Existing data, such as USGS topographic maps and NRCS soil survey maps, were reviewed to identify documented perennial drainages. Documented perennial streams were identified and these areas were evaluated during the delineation to determine if these conditions persisted.

4.0 RESULTS

The wetland delineation completed by MMI, consisted of reviewing existing site-specific information and completing an on-site inspection with sampling using the Routine Level 2 Determination Method outlined in the 1987 USACE Wetlands Delineation Manual.
The delineation effort consisted of a preliminary off-site investigation of available information and an on-site investigation that included a pedestrian survey of the project area, and delineation of individual wetlands and waterways. The investigation resulted in the delineation of twenty-two slope wetlands, five riverine wetlands, one depressional wetland, six slope/riverine wetlands, and one slope/depressional wetland. The total area of the thirty-five delineated wetlands on the property is approximately 22.95 acres.

4.1 OFF-SITE REVIEW

A preliminary off-site review was completed of the USGS 1987 Saddle Peak, Montana 7.5' Topographic Map (USGS 1987), provided as Figure 1; a privately flown orthographic aerial photograph of the subject property (Map Inc. 2006), provided as Figure 2; a portion of the U.S. Department of Agriculture *2002 Soil Survey of Gallatin County, Montana* (USDA 2002), provided as Figure 3; and the USFWS NWI map. NWI mapping has not been completed for the project area and was therefore unavailable for review.

4.1.1 USGS Topographic Map

A review of the Saddle Peak 1987 USGS 7.5' topographic map (Figure 1) of the area shows relatively steep terrain with an elevation change of approximately 620 feet across the property. The project area slopes from west to east, with the highest elevation of 6,640 feet in the northwest corner of the project area, and the lowest elevation of 5,820 feet in the southwest corner of the project area. Six drainages were identified on the topographic map. Bridger Creek is located in the eastern portion of the investigation area and is the major drainage present. Maynard Creek is identified in the central portion of the project area and is a tributary to Bridger Creek. The other four drainages are unnamed tributaries to Bridger Creek.

4.1.2 Aerial Photograph

A review of the aerial photograph (Figure 2) indicated the land use on site as primarily timber harvest. The project area is forested with evidence of several logged areas present. Bridger Creek flows through the eastern portion of the project area from north to south and is located adjacent to Bridger Canyon Road. Maynard Creek is located in the central portion of the project area and four unnamed drainages are located throughout. The six identified drainages were deemed to likely harbor wetlands and waterways.

4.1.3 Soil Survey Map

According to the *Soil Survey of Gallatin County, Montana*, ten soil map units were identified as occurring within the investigation area. On-site soil map units include: Bridger loam 2 to 8

vegetation includes prickly currant, willow species, cow-parsnip (*Heracleum lanatum*, FAC+), arrow-leaf groundsel, and nodding wild-rye (*Elymus Canadensis*, FAC). The wetland/upland boundary follows a change in vegetation from arrow-leaf groundsel, cow parsnip, and willow species in the wetland to common dandelion, Canada thistle (FACU+), timothy (*Phleum pratense*, FACU), and common tansy (*Tanacetum vulgare*, NI) in the upland.

Slope/Depressional Wetlands

Slope/depressional wetlands are wetlands that comprise characteristics of both slope and depressional wetland types in the form of a continuous wetland complex. One wetland was classified as slope/depressional wetland. Wetland W-3-06 begins as a slope wetland that extends into two small depressions with standing water (ponds). The wetland continues as a slope wetland downgradient of the ponds. The hydrology indicators are saturation in the upper 12 inches, free water occurring at a depth of 2 inches in the soil test pit, drainage patterns that occur in the wetland, and a positive FAC-Neutral test. The hydric soil indicators are low chroma color (10YR 2/1) and high organic matter content. The dominant wetland vegetation includes small-wing sedge (*Carex microptera*, FAC), tufted hairgrass (*Deschampsia cespitosa*, FACW), streamside bluebells (*Mertensia ciliate*, FACW+), cow-parsnip, field horsetail, and alsike clover. The wetland/upland boundary follows a change in vegetation from streamside bluebells, tufted hairgrass, and cow-parsnip in the wetland to Canada thistle, common yarrow (FACU), snowberry (*Symphoricarpos albus*, FACU), lodge-pole pine (FAC-), Douglas fir (NS), and lupine species (*Lupinus spp.*, FAC+ to FACU) in the upland.

4.3 OBSERVED JURISDICTIONAL STATUS

Twelve wetlands were preliminarily observed to be jurisdictional based on their surface hydrologic connection to a known waters of the U.S. The remaining wetlands were preliminarily observed to be non-jurisdictional. Final jurisdictional status for all delineated wetlands within the project area will be provided by USACE.

boundary follows a change in vegetation from beaked sedge, large-leaf avens, and green alder in the wetland to bracken fern (*Pteridium aquilinum*, FACU), strawberry (*Fragaria virginiana*, FACU), common dandelion (*Taraxacum officinale*, FACU), Richardson's crane's-bill (FAC-), and elder species (*Sambucus spp.*, FACU to OBL) in the upland.

Riverine Wetland

Riverine wetlands include waterways or drainage systems along with their immediately adjacent wetlands. Five riverine wetlands were delineated within the project area, all of which were preliminarily observed to be jurisdictional. Riverine wetland W-23-06, associated with Bridger Creek, is a typical riverine wetland within the project area that flows north to south in the eastern portion of the investigation area. The hydrology indicators are drainage patterns in the wetland and a positive FAC-Neutral test. The hydric soil indicator is low chroma color (7.5YR 3/1). The dominant wetland vegetation includes reed canary grass (*Phalaris arundinacea*, FACW), field horsetail, large-leaf avens, prickly currant (*Ribes lacustre*, FAC+), willow species (OBL to FAC), and starry false Solomon's-seal (*Smilacina stellata*, FAC-). The wetland/upland boundary follows a change in vegetation from large-leaf avens, reed canary grass, and willow in the wetland to sticky crane's-bill (*Geranium viscosissimum*, FACU+), Richardson's crane-bill, prickly currant, common red raspberry (*Rubus idaeus*, FACU), and smooth brome (*Bromus inermis*, NS) in the upland.

Depressional Wetlands

Depressional wetlands include wetlands that typically form in isolated depressions such as glacial potholes. Hydrology for these wetlands may either be supplied by groundwater seepage, surface water from the surrounding watershed, or a combination of the two. One wetland was classified as depressional. Wetland W-27-06 is a depressional wetland located in the north-central portion of the investigation area. This wetland was preliminarily observed to be non-jurisdictional. The hydrology indicators include saturation in the upper 12 inches, inundated soils with 1 to 3 inches of standing water, and drainage patterns in the wetland. The hydric soil indicator is low chroma color (2.5Y 3/1). The dominant wetland vegetation includes large-leaf avens, and hairy willow-herb. The wetland/upland boundary follows a change in vegetation from large-leaf avens and hairy willow-herb in the wetland to common dandelion, strawberry, and Richardson's crane's-bill in the upland.

Slope/Riverine Wetlands

Slope/riverine wetlands are wetlands that have characteristics of both slope and riverine wetland types in the form of a continuous wetland complex. Six wetlands were identified as slope/riverine, five of which were preliminarily observed to be jurisdictional. Wetland W-19-06 is a typical slope/riverine wetland within the project area that is located in the central portion of the investigation area. This wetland was observed to be likely jurisdictional. Wetland W-19-06 begins in a large alpine meadow, extends into a channel downslope of the meadow, and ultimately terminates into Bridger Creek. The hydrology indicator is drainage patterns in the wetland. The hydric soil indicator is low chroma color (10YR 3/1). The dominant wetland

5.0 REFERENCES

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