

**APPENDIX D10:
WETLANDS**

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LIST OF ABBREVIATIONS AND ACRONYMS

COE	Corps of Engineers
FAC	Facultative
FACU	Facultative upland
FACW	Facultative wetland
GPS	Global positioning system
ISR	In Situ Recovery
NI	Insufficient information
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
OBL	Obligate wetland
PEMC	Palustrine emergent seasonally flooded
PEMF	Palustrine emergent semipermanently flooded
UPL	Upland
USGS	U.S. Geological Survey
WDEQ/LQD	Wyoming Department of Environmental Quality, Land Quality Division
WUS	Waters of the U.S.

D10.1.0 INTRODUCTION

A survey for potential wetlands (and other waters of the U.S. [WUS]) within the Nichols Ranch ISR Project area was conducted as required by the Wyoming Department of Environmental Quality, Land Quality Division (WDEQ/LQD) Guideline No. 6 (1997).

The U.S. Army Corps of Engineers (COE) defines wetlands as “areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (COE 1987). Most WUS in the area are ephemeral channels so, for the purposes of this delineation, WUS were identified as those channels with a well-defined bed and bank. WUS boundaries extend to the ordinary high-water mark or to the boundaries of adjacent wetlands (COE 1987).

The purpose of the wetland survey is to establish the location and quantity of premine wetland habitats and WUS. The information presented herein includes a description of the wetland and WUS habitat, its distribution, and vegetative species composition.

D10.1.1 LOCATION OF PROJECT

The Nichols Ranch ISR Project area is located in Campbell and Johnson Counties, Wyoming, and encompasses two production units--the Hank Unit and the Nichols Ranch Unit. The project area encompasses approximately 3,370.53 acres in portions of Sections 7, 8, 17, 18, and 20, T43N, R76W, and Sections 30 and 31, T44N, R75W, and Sections 5, 6, 7 and 8, T43N, R75W. Access to the project area is by way of the Van Buggenum Road off Wyoming Highway 50. The project area is within the 10- to 14-inch Northern Plains (10-14NP) zone of northeastern Wyoming (Natural Resources Conservation Service [NRCS] 1988). Topographic relief ranges from 4,670 to 4,900 ft above mean sea level in the Nichols Ranch Unit and from 5,055 to 5,209 ft above mean sea level in the Hank Unit. Annual precipitation varies from 10- to 14 inches, with approximately 35-41% falling during the normal growing season (NRCS 1988). Growth of native cool-season plants begins about April 1 and continues to about July 1. Growth

of native warm-season plants begins about May 15 and continues to about August 15. According to Wyoming Gap data, two primary vegetation types occur in the project area--sagebrush shrubland and mixed grassland (Wyoming Gap Analysis 2000).

Cottonwood Creek, an ephemeral stream, is the main drainage in the Nichols Ranch Unit. Several artesian springs are located in the Cottonwood Creek drainage east and west of the Nichols Ranch Unit. Within the project area, Cottonwood Creek has been altered by local ranches and a system of irrigation ditches has been constructed to supply water to the area for hay production; therefore, there is no typical pool-riffle riverine system in the project area. Within one drainage to Cottonwood Creek, two ponds with adjacent wetlands have been created by local ranches excavating to the water table. Two ephemeral streams--Dry Willow Creek and Willow Creek--are the main drainages of the Hank Unit. No springs or seeps occur in the Hank Unit. Current land use in the project area is primarily livestock grazing, wildlife habitat, and coalbed methane and natural gas development.

D10.1.2 PERMITTING REQUIREMENTS

Protection of wetlands and other WUS is the responsibility of the COE. In order to comply with WDEQ/LQD permitting requirements and Section 404 of the federal *Clean Water Act*, a Nationwide Permit 44 from the COE may be required if there are discharges of dredged or fill material into a WUS that exceeds 0.5 acre in size. The Nationwide Permit 44 is specific to mining activities and requires the delineation and verification of jurisdictional wetlands and WUS in the affected area.

D10.2.0 SURVEY METHODS

On-site inspections of the project area for potential jurisdictional wetlands and WUS were conducted throughout the 2006 growing season using procedures outlined in COE (1987). Prior to fieldwork, background information was obtained from National Wetland Inventory (NWI) maps, U.S. Geological Survey (USGS) topographic maps, and aerial photographs. Information from the NWI maps is presented in Figures D10-1 and D10-2. These sources were used to identify areas likely to contain wetlands and other WUS. All potential wetland and WUS sites identified on the NWI or USGS maps were visited to determine if a wetland or WUS were present. If at least the wetland indicator was present, the site was evaluated further to determine if a wetland was present. Other areas not designated as wetlands on the NWI map were investigated if standing water or other primary or secondary hydrology indicators were present or if areas of hydrophytic vegetation were observed.

During the on-site inspection, geomorphic and hydrologic characteristics of the site were investigated to determine if primary wetland hydrology indicators were present, including inundation, saturation, water marks, sediment deposits, drainage patterns, and drift lines. Secondary indicators (e.g., oxidized root channels) were searched for only if no primary indicators were identified.

Dominant plant species were identified at each potential wetland site to determine if hydrophytic vegetation was present. Plant species were either identified on-site or taken to the Rocky Mountain Herbarium at the University of Wyoming in Laramie and identified. An ocular estimate of percent cover was used to determine dominant species at each wetland site. *The National List of Plant Species that Occur in Wetlands: North Plains (Region 4)* (Reed 1988) was used to determine the indicator status of dominant plants within each community, and plant species were classified as obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), upland (UPL) species, or insufficient information is available to determine an indicator species (NI).

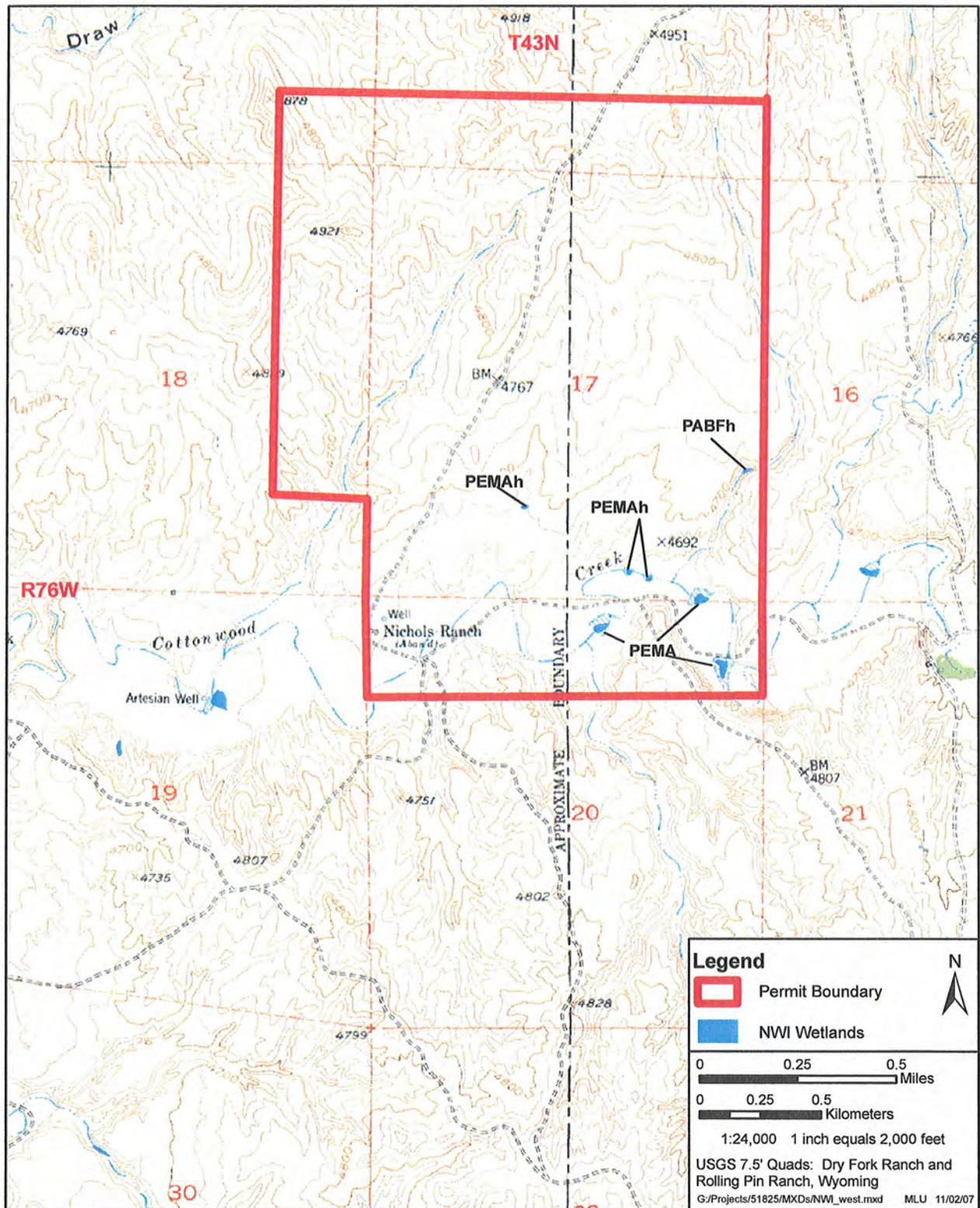


Figure D10-1 NWI Information, Nichols Ranch Unit, 2007.

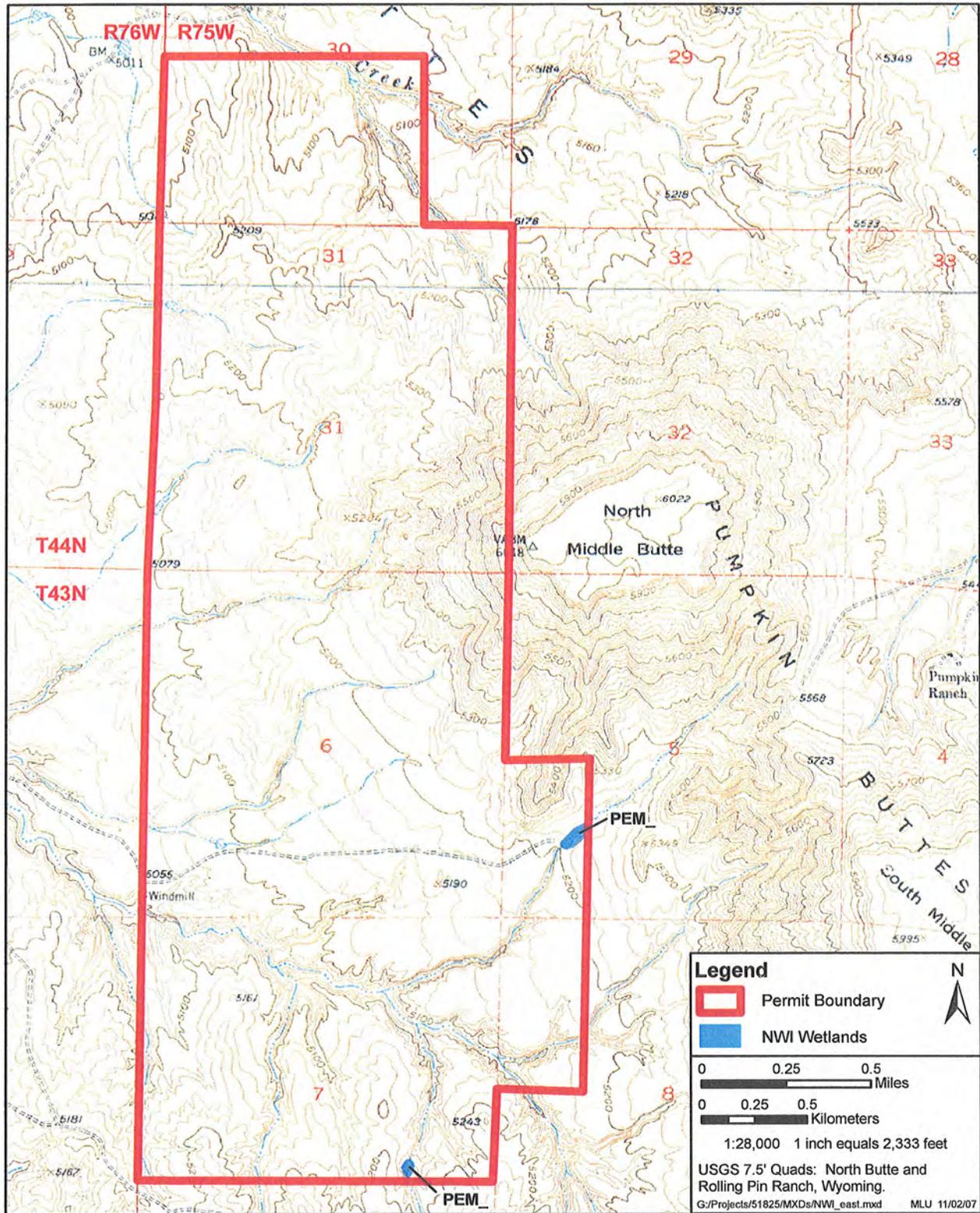


Figure D10-2 NWI Information, Hank Unit, 2007.

If vegetative and hydrologic wetland criteria were met, soil profiles were examined for hydric soil characteristics (e.g., mottling, gleying, saturation). Soil color was determined using a Munsell Soil Color Chart. Soil information was obtained from the Order 2 Soil Survey for the project (refer to Appendix D7). Wetland acreage was measured in the field and wetland boundaries were recorded with a Trimble Explorer 3 handheld Global Positioning System (GPS) unit. Relevant information about potential jurisdictional wetlands was then documented on appropriate COE-approved wetland delineation forms.

D10.3.0 RESULTS

D10.3.1 INTRODUCTION

The survey of potential jurisdictional wetlands and WUS was completed in June and July 2006 in accordance with the survey methods presented in Section D10.2. The survey was conducted by Ms. Jan Hart of TRC Environmental Corporation, Laramie, Wyoming. Ms. Hart is a COE-certified wetland delineator, has received formal wetland training from the Wetland Training Institute in 1998, and has been conducting jurisdictional wetland surveys since 1998.

NWI map information for each unit of the project area is presented on Figures D10-1 and D10-2. All potential wetland or WUS areas identified on the NWI maps were visited; however, not all NWI wetlands fit the COE criteria (i.e. the presence of either primary or secondary indicators of wetland hydrology, hydric soils or hydrophytic vegetation). Photographs of wetland Sites 1-3 and WUS are presented in Addendum D10A. No photograph is available for wetland Site 4. Wetland delineation forms were completed for each site determined to be a wetland and are presented in Addendum D10B.

D10.3.2 RESULTS FOR NICHOLS RANCH UNIT

D10.3.2.1 Wetlands

Four jurisdictional wetland sites were delineated in the Nichols Ranch Unit of the project area (refer to Table D10-1 and Figure D10-3). Sites 1, 2, and 3 are linear palustrine type wetlands located in a drainage to Cottonwood Creek. Site 4 is below an overflowing stock tank located in the Cottonwood drainage. Sites 1, 3, and 4 were inundated, and water is supplied to these sites from groundwater (i.e., springs). Sites 1 and 3 were created prior to 1950 and are the result of excavation to the water table, thereby creating small ponds (personal communication March 1, 2007, with Patricia Clark, T-Chair Ranch). Site 2 has signs of inundation (i.e., water marks and salt deposits). Vegetation at all four wetland sites is composed of hydrophytic species such as cattail, four-square bulrush, Baltic rush, rabbitfoot grass, barnyard grass, and foxtail barley.

Table D10-1 Wetland Sites, Nichols Ranch ISR Project Area, 2007.

Site Number	NWI Designation ¹	Field Determination	Wetland Acres in Project Area	Wetland Acres Affected
1	PEMC	Wetland	0.498	0
2	PEMF	Wetland	0.117	0
3	PEMC	Wetland	0.487	0
4	--	Wetland	0.102	0
Total			1.20	0

¹ PEMC = Palustrine emergent seasonally flooded; PEMF = Palustrine emergent semipermanently flooded.

Soils at all four wetland sites were determined to be hydric. None of the jurisdictional wetland sites in the Nichols Ranch Unit will be disturbed by mining activities.

D10.3.2.2 WUS

Approximately 21,722 linear ft of WUS occur in the Nichols Ranch Unit, and all WUS were dry at the time of the site visits (refer to Table D10-1 and Figure D10-3). In the Nichols Ranch Unit, drainage is to the southwest to Cottonwood Creek via small ephemeral moderately to deeply incised (1- to 15-ft banks) channels that range from 1 to 15 ft wide. WUS Segment 25 (refer to Figure D10-3) is deeply incised with 20- to 30-ft high banks. Within the Nichols Ranch Unit, Cottonwood Creek has been altered with a system of irrigation ditches and spreader dikes have been constructed to supply water to the area for hay production; therefore, there is no typical pool-riffle riverine system in the Nichols Ranch Unit. The spreader dikes are referred to in a 1927 description of the ranch (personal communication, March 1, 2007, with Patricia Clark, T-Chair Ranch).

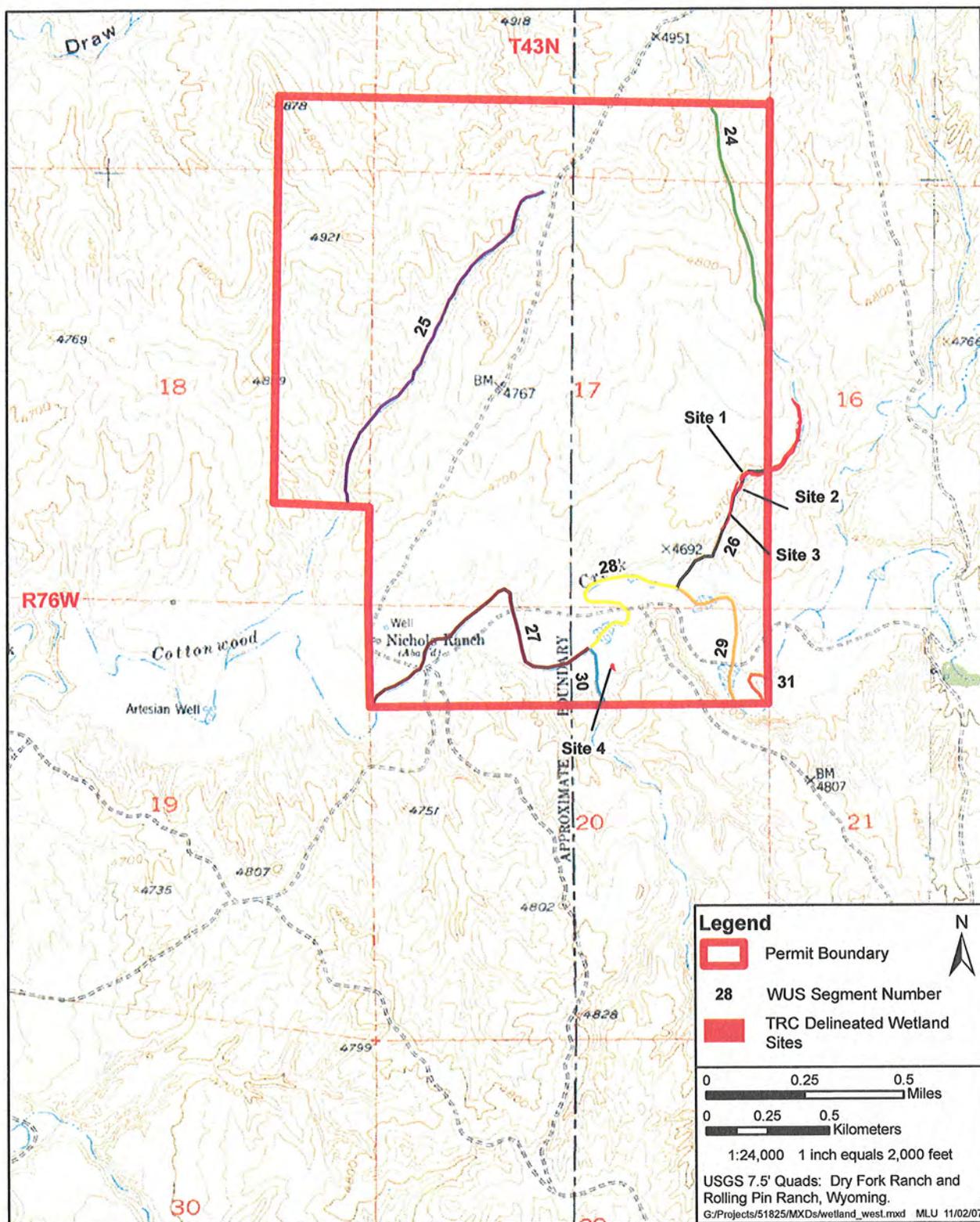


Figure D10-3 WUS Locations and Wetland Sites Delineated on the Nichols Ranch Unit, 2007.

D10.3.3 RESULTS FOR THE HANK UNIT

D10.3.3.1 Wetlands

Several palustrine wetlands are identified on the NWI map within the Hank Unit (refer to Figure D10-2); however, field investigation of these sites determined them to be non-wetlands based on the prevalence of upland plant species. Vegetation at these sites was composed of western wheatgrass, Wyoming big sagebrush, Sandberg bluegrass, cheatgrass, needle-and-thread grass, and threadleaf sedge. The sites were dry. The sites were not investigated for the presence of hydric soils due to the prevalence of upland plant species.

D10.3.3.2 WUS

Approximately 49,649 linear ft of WUS occur in the Hank Unit (Table D10-2 and Figure D10-4). In the Hank Unit, drainage generally is to the northwest and west off North Middle and South Middle Buttes via Dry Willow Creek and Willow Creek. Channel widths generally ranged from 1 to 2 ft in the headwater areas of these WUS and increased to 20 to 30 ft wide where the WUS leave the western edge of the Hank Unit. In general, the WUS are deeply incised with 10- to 50-ft high banks in the southern and northeastern portions of the Hank Unit and less incised in other parts of unit.

Table D10-2 Linear Feet of WUS, Nichols Ranch ISR Project Area, 2007.

WUS Identification Number	Linear Feet
Hank Unit	
1	620
2	1,262
3	2,329
4	641
5	1,712
6	2,650
7	3,701
8	4,601
9	190
10	5,850
11	4,391
12	4,587
13	2,712
14	1,745
15	772
16	1,451
17	2,642
18	3,775
19	1,443
20	700
21	1,261
22	156
23	458

Subtotal	49,649
Nichols Ranch Unit	
24	3,328
25	5,213
26	2,195
27	4,426
28	2,813
30	803
29	2,236
31	707

Subtotal	21,721
Total	71,370

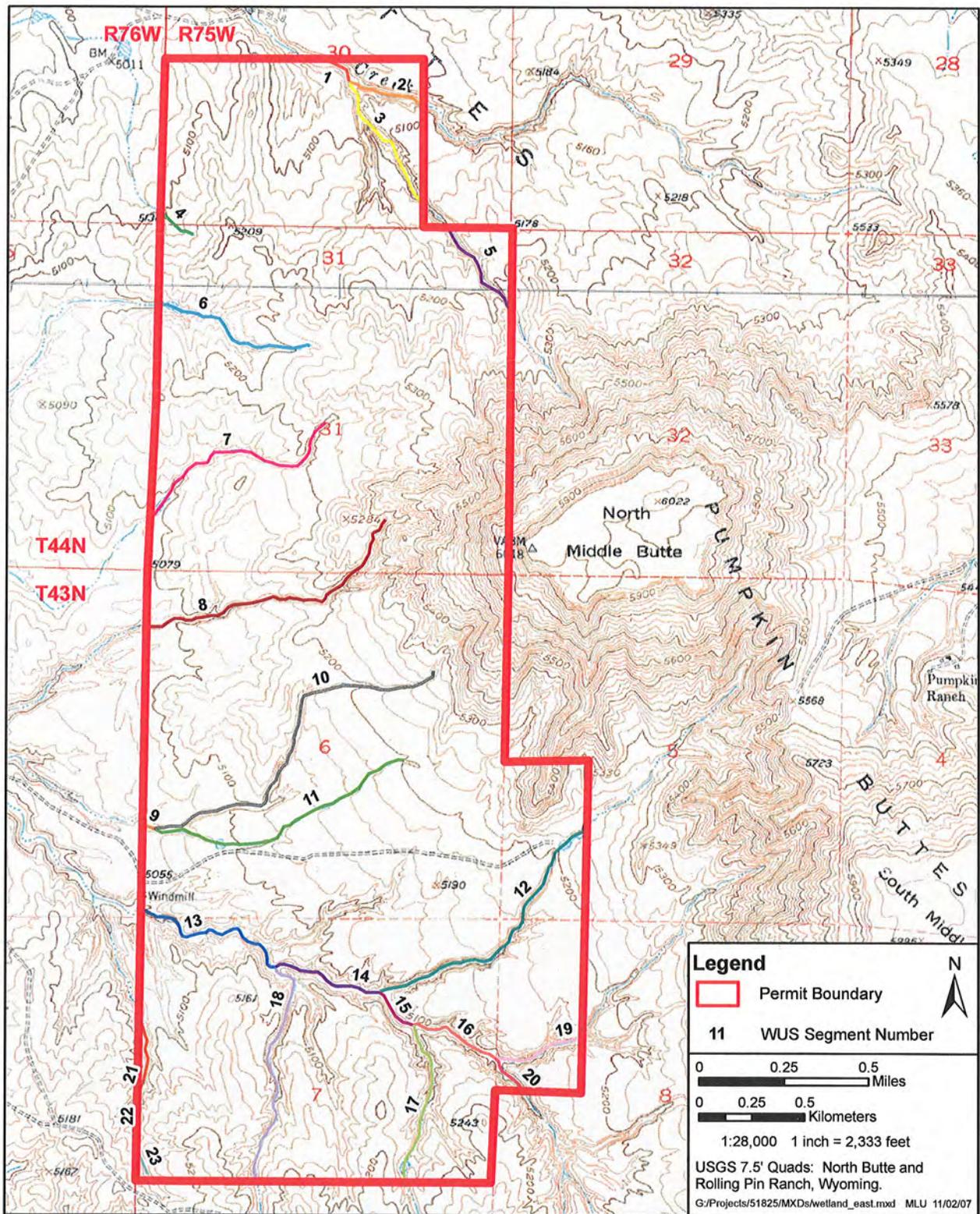


Figure D10-4 WUS Locations on the Hank Unit, 2007.

D10.4.0 CONCLUSION AND RECOMMENDATIONS

No jurisdictional wetlands will be disturbed by mining activities. WUS will be crossed at established roads and the appropriate sized culverts will be installed as required for any new roads constructed for the project. A COE Nationwide Permit 44 is required if discharges of dredged or fill material into a wetland or WUS exceeds 0.5 acre. Consequently, based on the current mine plan, an individual or nationwide permit from the COE will not be required. In the event that further disturbance would occur in a wetland or other WUS, consultation with the COE will be initiated.

D10.5.0 LITERATURE CITED

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