



July 25, 2012

Ms. Mary Ramero U.S. Army Corps of Engineers, Alaska District P.O. Box 6898 2204 3rd St. JBER, AK 99506-0898

Subject: Request for Approved Jurisdictional Determination of Proposed Mustang Development Project Area, Southern Miluveach Unit, North Slope, Alaska

Dear Ms. Ramero:

On behalf of Brooks Range Petroleum Corporation (BRPC), OASIS Environmental, Inc., an ERM Company (OASIS), submits this request for an approved jurisdictional determination to the U.S. Army Corps of Engineers (USACE). It covers the wetland delineation conducted by our office in the proposed oil and gas reservoir called the Mustang Field, located in the Southern Miluveach Unit (SMU) and adjacent to the western boundary of the Kuparuk River Unit (KPU) on Alaska's North Slope.

This cover letter and included report follow guidance provided in Special Public Notice (SPN) 2010-45 "Consultant-Supplied Jurisdictional Determination Reports" (January 29, 2010), and summarize our approach and findings. We request USACE confirm that:

- the wetland delineation performed by OASIS complies with USACE methodology;
- there are no other wetlands present within the project area; and
- OASIS has evaluated the jurisdictional status of the project area wetlands appropriately.

As per SPN 2010-45, the following information is provided for reference:

PURPOSE OF THE REQUEST & PROJECT DESCRIPTION

The purpose of this request is to obtain an approved jurisdictional determination for the wetlands located within the proposed project area. BRPC proposes to develop the Mustang Field, an oil and gas reservoir located in the Southern Miluveach Unit [SMU] and adjacent to the western unit boundary of the Kuparuk River Unit [KRU]. The target horizon is the Kuparuk C sand. The proposed development will include an independent, standalone processing center to produce dry oil for transport and sales to the Alpine common carrier pipeline system. Source water for Mustang reservoir pressure maintenance and waterflood will come from the Alpine source water line via pipeline in the same pipeline corridor as the Alpine common-carrier sales pipeline. Shared wellbores, horizontal drilling technology and long-reach wells will be used to maximize production while minimizing surface impacts. BRPC expects to recover 40 million barrels (bbl) of oil from these accumulations.

The assessment area included all of the areas being considered for project activities (including project alternatives) plus a 250-meter buffer around all proposed design footprints for a total of 2,014 acres. More

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specifically, the project area is located in the USGS Quad Harrison Bay A1 & B1; 70.2590 ddN, -150.1840 ddW NAD83 datum; Township 10N, Range 7E; Township 10N, R8E; Township 11N, Range 7E; Township 11N, Range 8E of the Umiat Meridian (UM).

The project area can be accessed via road travel or air. From Prudhoe Bay, the project site can be accessed through the greater Prudhoe Bay road infrastructure. Beginning at the Deadhorse Airport, follow the Spine Road to the wye intersection of the Oliktok and Tarn/Meltwater roads; then follow the Tarn/Meltwater Road until just southwest of the Kuparuk River Unit Drill Site 2 where the proposed Mustang Project access road will leave the Tarn/Meltwater Road and proceed west to the proposed project drilling and production pad. Total road travel is approximately 48 miles from the Deadhorse Airport to reach the proposed Mustang access road.

CURRENT PROPERTY OWNER

State of Alaska, Department of Natural Resources Office of the Commissioner 550 W. 7th Ave., Suite 1400 Anchorage, AK 99501

APPLICANT

Brooks Range Petroleum Corporation Mark Wiggin 510 L Street, Suite 601 Anchorage, AK 99516 (907) 339-9965

WETLAND DELINEATOR

OASIS Environmental, Inc., *an ERM Company*Jeannette Blank and Levia Shoutis (Delineators), Dave Trudgen (Contact) 825 W. 8th Ave.
Anchorage, AK 99501
(907) 258-4880

LANDOWNER PROPERTY ACCESS PERMISSION

A letter granting permission to access the project site is provided in Appendix A (signed by landowner and renter). A drafted letter has been compiled for Brooks Range to use or edit.

REQUEST SUMMARY

OASIS on behalf of BRPC requests an approved jurisdictional determination for the proposed Mustang Development project area. If you have questions or require additional information, please contact Dave Trudgen or myself at (907) 258-4880.



Sincerely,

OASIS Environmental, Inc., an ERM company

MacNamara Shoulders

Project Manager

MUSTANG DEVELOPMENT PROJECT

REQUEST FOR JURISDICTIONAL DETERMINATION APPROVAL



July 25, 2012

Prepared for:

Brooks Range Petroleum Corporation

510 L St., Suite 601 Anchorage, AK 99501

Prepared by:



An ERM Company 825 W. 8th Ave. Anchorage, AK 99501

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ACRONYMS AND ABBREVIATIONS

ACP	. Arctic Coastal Plain
ACS	. Alaska Clean Seas
ADF&G	. Alaska Department of Fish & Game
ADNR	. Alaska Department of Natural Resources
bgs	.below ground surface
BLM	.Bureau of Land Management
BRPC	.Brooks Range Petroleum Corporation
CAH	. Central Arctic Caribou Herd
CFR	.Code of Federal Regulations
USACE Manual	. 1987 USACE of Engineers Wetland Delineation Manual
CWA	. Clean Water Act
DP	.Determination Point
GPS	. Global Positioning System
JD	.Jurisdictional Determination
MDP	.Mustang Development Project
NRCS	National Resources Conservation Service
NSB	. North Slope Borough
NWI	. National Wetlands Inventory
OASIS	OASIS Environmental, Inc., an ERM company
PCH	. Porcupine Caribou Herd
PJD	Preliminary Jurisdictional Determination
Regional Supplement	Alaska Regional Supplement to the 1987 USACE Manual
RPW	. Relatively permanent waters
TCH	.Teshekpuk Caribou Herd
TNW	.traditional navigable waters
UM	. Umiat Meridian
USACE	. United States Army Corps of Engineers
USDA	. United States Department of Agriculture
USDOI	. United States Department of the Interior
USFWS	.United States Fish & Wildlife Service
USGS	. United States Geologic Survey
VSM	. Vertical Support Member
	. Western Arctic Caribou Herd
WET	.Wetland Evaluation Technique

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1. INTRODUCTION

This report presents the results of wetland delineations, characterizations, and wetland and aquatic habitat mapping for the proposed Mustang Development Project (MDP). The MDP is located in the Arctic Coastal Plain (ACP) ecoregion of Alaska (USGS, 1995), a poorly drained, treeless coastal area that rises gradually from sea level to the northern foothills of the Brooks Range. The nearly level to gently rolling topography is underlain by thick permafrost, one to four feet below ground surface. This relatively impermeable permafrost acts as a shallow aquitard, creating a generally moist to wet environment with numerous ponds and lakes (as observed within the proposed project area).

Brooks Range Petroleum Corporation (BRPC) is proposing to develop the Mustang Field, an oil and gas reservoir located in the Southern Miluveach Unit [SMU] and adjacent to the western boundary of the Kuparuk River Unit [KRU]. The assessment area included all of the areas being considered for project activities (including project alternatives) plus a 250-meter buffer around all proposed design footprints for a total of 2,014 acres. More specifically, the project area is located in the USGS Quad Harrison Bay A1 & B1; 70.2590, -150.1840 decimal degrees in NAD83 datum; Township 10N, Range 7E; Township 10N, R8E; Township 11N, Range 7E; Township 11N, Range 8E of the Umiat Meridian (UM).

Full details of the Mustang Development project are described in the "Mustang Development Project Description" (BRPC 2012).

The Mustang Field will be a development of the same reservoir interval—Kuparuk "C" sand—as is being produced in the Kuparuk River Unit. Maximum oil production rate is predicted will be 15,000 bpd and total expected recovery will be approximately 40 million barrels oil over an expected field life of 15 years. Reservoir water flood and pressure support will employ KRU Seawater Treatment Plant. Surface facility development for the Mustang Field will make provision for up to 38 wells on a minimum of 15-foot well centers. Power for process facilities and non-process infrastructure will be generated onsite with dual-fueled turbine generation packages. All produced gas volumes not used for fuel gas will be re-injected into the productive horizon for pressure support. Lift gas will be the lift mechanism for the field.

The separation process will be a 2-phase separation with inlet heater, inlet separator, and treater followed by crude cooling, crude sales measurement, and shipping pumps to the Alpine Transportation Company pipeline. Well allocations will be accomplished using a test separator configuration at the drill site adjacent to the wells.

1.1. Primary Development Elements

The overall scope of the development includes the following major elements: 1) gravel mine development, gavel roads, and production pad; 2) drill site modules, central processing facility modules, and cross country pipelines; 3) non-process buildings and equipment; 4) communications tower and related hardware; 5) injection and production wells; 6) temporary drilling support facilities, vehicles, and equipment. The Mustang oil

field will be developed as a standalone process facility concept, one largely independent of connections to existing North Slope processing facilities. The only process connections between the Mustang facility and existing field process infrastructure will be two pipeline connections; 1) approximately an 6" diameter crude sales pipeline with connection to the Alpine Transportation Company 14" diameter crude sales pipeline, and 2) approximately an 6" diameter water pipeline with connection to the Alpine 12" source water pipeline, both approximately 750 feet from Mustang pad.

1.2. Development Elements and Associated Components

As a standalone, independent oil field, Mustang will necessitate installation of many of the same facility and project components associated with other North Slope oil field developments. The Mustang project will include the following major components:

1.2.1. Gravel Mine, Roads and Pad

(See Appendix A of the 404 Application, "Mustang Gravel Mine Development and Rehabilitation Plan")

- Ice roads to support gravel mine development and pad / road construction in winter-2013 through April-2013;
- A 500 ft by 500 ft wide ice pad to be constructed adjacent to the access road, approximately one mile east of the Mustang production pad, used to support installation of the production facilities during the winter of 2012 and 2013;
- Development of a gravel mine 3,400 feet north of Mustang production pad;
- A 0.67 mile, 32 feet wide, gravel mine access road (4.3 acres) between gravel mine and access road to production pad;
- An approximately 4.4 mile, 32 feet wide production pad access road (29 acres) to connect Mustang Pad to KRU road near KRU Drill Site 2M; and
- Gravel production pad [~19 acres] for wells, central production facilities, and nonprocess infrastructure.

1.2.2. Surface Process Facilities and Cross-Country Pipelines

- Three-phase central processing facility to produce sales-quality crude;
- Tank Farm:
- Well tie-ins, pipe rack, headers, and well test separation for production allocation;
- Oil pipeline for transport of sales oil to the Alpine Pipeline;
- Water pipeline for seawater transport from the Alpine source water pipe-line to the Mustang Field; and
- Pipe rack and ancillaries for up to 38 production and injection wells and associated well tie-ins.

1.2.3. Non-Process Buildings / Equipment

Buildings will include:

- Operations / Drilling Camp ~ 120-bed
- Construction Camp ~ 250-bed
- Operations Support Center [OSC]
 - Warehouse
 - Maintenance facility
 - Storage
 - Offices
 - Process Control room
- Construction Support Center [CSC]
 - Warehousing and issue counter
 - Welding
 - Laydown
 - Maintenance
- Non-process equipment and vehicles will potentially include:
 - Rolling stock such as loaders / vac trucks / diesel fuelers
 - Light Plants / portable generation
 - Passenger vehicles / transport buses / work trucks

1.2.4. Communications infrastructure

- Tower
- Communications Module

1.2.5. Wells

 Initial 12 producers and 11 injectors on 30 foot well centers with provision for up to 38 wells on 15 foot well centers

1.3. Purpose

The purpose of the wetland delineation and evaluation work is to identify areas of the proposed project that are within the jurisdiction of Section 404 of the Clean Water Act (CWA) as interpreted by the United States Army Corps of Engineers (USACE), Alaska District. These jurisdictional areas require authorizations from USACE prior to development activities in the form of a Section 404 permit for the discharge of dredged or fill material into waters of the U.S., and wetlands. Section 404 jurisdiction includes all "waters of the U.S." as defined in 33 CFR Part 328.3(a)(1 – 8). This report and attached maps and data are provided to assist USACE in developing an approved jurisdictional determination (JD) of wetlands and waters within the assessment area.

The 2,014-acre area investigated for the proposed MDP spans approximately 9 kilometers, and ranges from between 500-1500 meters wide, between the Tarn/Meltwater Road near DS2M and west to the Miluveach River. The assessment

area (wetland mapping area) includes all of the proposed project infrastructure, proposed gravel mine, access roads, as well as potential alternatives, and a surrounding 'buffer area' (extending a minimum of 250-meters from proposed infrastructure centerlines) that may be affected by project activities (See Appendix B, Figures). In addition to the buffered project area, the assessment area also includes a few additional areas, such as the area between the proposed and alternative road alignments, where it was more efficient to map these intermediary areas rather than subsequently clip them out. Note that the proposed and alternative alignments have changed since the original field assessment, and the proposed gravel mine has been added north of the project area, thus there are wetland determination points located outside of the current assessment area.

For the purpose of this report, the entire assessment area has been evaluated for the presence of jurisdictional wetlands and waterways. The following sections describe methods and findings of this evaluation.

The wetland investigation included the following:

- Documentation of the presence of wetlands and waters of the U. S. occurring within the proposed project corridor and alternatives;
- Delineation of the wetland boundaries and uplands occurring within the proposed project corridor and alternatives using accurate field mapping techniques;
- Characterization of vegetation communities and habitats potentially affected by the project;
- Assessment of the function and value of these communities. (Note: the functions and values assessment is described in a separate project report titled the "Mustang Development Project Wetland Functional Assessment and Categorization Report").

This jurisdictional determination report includes:

- A description of the methods used to evaluate project area wetlands and a summary of the important findings;
- A letter from the landowner granting permission to access the site if necessary to assist USACE in the JD evaluation process (Appendix A);
- Wetland classification and mapping (Appendix B) using field data, topographic maps, 1 ft-resolution aerial imagery, and U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Mapper (http://www.fws.gov/wetlands/Data/Mapper.html);
- Supporting figures for jurisdictional determination findings (Appendix B);
- The field survey data (datasheets) used to verify wetland and upland boundaries (Appendix C) and associated photographs (Appendix D);
- A list of plant species observed on site and a list of wildlife species associated with Arctic Coastal Plain habitat (Appendix E); and

• A preliminary jurisdictional determination (PJD) form to assist in the JD evaluation (Appendix F).

The field survey was performed for and under the direction of BRPC by OASIS on August 5th through August 10th of 2011, during the normal growing season when vegetation, soils, and hydrology parameters were obtainable for detailed evaluation. On August 5th and 6th the sites were accessed by helicopter operated by Bristow Helicopters in Deadhorse, AK and on August 7th through the 10th the sites were accessed via pick-up truck on gravel roads from Deadhorse and walking. Project design plans were updated following the 2011 field season which required additional 'desktop' wetland mapping using ArcMap10, and 1 ft resolution aerial imagery.

1.4. Background Information

The project area is located in the Arctic Coastal Plain (ACP) ecoregion of Alaska (USGS, 1995). The ACP is a poorly drained, treeless coastal area that rises gradually from sea level to the northern foothills of the Brooks Range. The nearly level to gently rolling topography is underlain by thick permafrost, one to four feet below ground surface. This relatively impermeable permafrost acts as a shallow aquitard, creating a generally moist to wet environment with numerous ponds and lakes (as observed within the proposed project area). Average annual precipitation ranges from 100 mm to 150 mm. Average annual temperature ranges from 13°C to -10°C. Freezing can occur in any month of the year. Winds are persistent and are a contributing factor in shaping the vegetation and landforms of the area, although freeze-thaw cycles predominate in shaping the landscape. Microtopographic landscape features that affect soil drainage are also closely connected to the distribution of vegetation communities. As defined by Walker's (1983) Level C classification, there are 16 community types in the assessment area, including 14 wetland vegetation communities, 1 imported gravel area, and 1 upland community (Table 1 and Appendix B).

Rivers and streams within the proposed project area have their headwaters in the ACP. Streams originating in the ACP tend to have low velocities and have one spring peak in their hydrograph, corresponding with spring breakup. Surface water drainage patterns in the project areas are depicted in the Map Atlas (Appendix B)(Alaska Clean Seas 2010, http://www.alaskacleanseas.org/tech-manual/).

The ACP provides a diversity of bird habitat that includes large rivers, deltas, barrier islands and lagoons, wetlands, and many lakes and ponds (USACE 1999). These areas are used for molting, nesting, brood rearing, foraging, and as migration staging areas (USDOI, BLM 2004). Large mammals such as caribou, muskoxen and grizzly bear use the proposed project area on a seasonal basis.

The calving and summer range of the Central Arctic Caribou Herd (CAH) encompasses much of the Prudhoe Bay oil fields and the lower reaches of Kuparuk River (Arthur and Del Vecchio 2007). The CAH winters in the northern and southern foothills and mountains of the Brooks Range. The herd's range often overlaps with the Porcupine caribou herd (PCH) on summer and winter range to the east and with the Western Arctic

(WAH) and Teshekpuk (TCH) Herds on summer and winter range to the west. (ADF&G 2001).

Muskoxen are far less common than caribou in the area. Encounters in or near the project area or on roadways are expected to be rare. Current numbers of this reintroduced ACP population are depressed. Recent studies indicate they are vulnerable to calf predation by grizzly bears. Muskoxen generally avoid areas of deep snow in winter (ADF&G 2001). In summer, small herds disperse across the tundra and are often observed to the west in the lower Sagavanirktok river area.

Grizzly bears (*Ursus arctos*) on the Arctic Coastal Plain are at the northern limit of their range in North America and are major predators of both musk ox and caribou (Reynolds et al. 2002). However, the coastal plain is considered marginal bear habitat due to severe climate, short growing season, and limited food resources (Shideler and Hechtel, 2000).

The Miluveach River headwaters are located to the south in the ACP. The Miluveach River contains Dolly Varden (*Salvelinus malma*) and whitefish (undifferentiated species) anadromous fish populations (ADFG, 2011) in the vicinity of the project.

Please refer to the Environmental Report for a more detailed discussion of the wildlife habitat and species use of the proposed project area.

Historic and existing landuse within the proposed project area is minimal. The Tarn/Meltwater road has the only existing gravel in the project area. Approximately 1.8 acres of the road lie withinin the proposed project area. There is no other prior development within the proposed project area. There are also no known 'environmental concerns' such as contamination or pollutants within the proposed project area.

2. METHODS

2.1. Wetland Delineation

Wetland determinations were performed by experienced wetland scientists according to the 1987 Corps of Engineers Wetland Delineation Manual (Corps Manual) (USACE 1987) and the Alaska Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (USACE 2007b). The primary tasks included a review of existing maps and ecological information, collection of field data at sample points to determine the presence or absence of wetlands including characterization, and delineation of the boundaries separating uplands and wetlands by habitat type.

Wetlands and waters within the entire assessment area were mapped using a combination of desktop and field techniques. Field data was collected in 2011 to map vegetation community types and boundary locations. Vegetation throughout the assessment area was mapped to Level C of Walker's (1983) hierarchical vegetation classification ("Walker"), which describes communities based on site moisture regime, dominant plant growth form, and physiognomic descriptor. This level of mapping relies on aerial photo interpretation with extensive ground reference data. To groundtruth the desktop vegetation mapping, thirty field determination points (DP) were established within the proposed project corridor and alternate corridor, with consistent spacing (≤0.8 km) to provide adequate coverage for mapping. A total of 30 data points were collected in the field. At each determination point, a wetland determination was completed using USACE (1987) standard wetland delineation methods. In an effort to classify vegetation using Walker et al (1987), the following vegetation data was collected at each determination point: plant species and percent cover, dominant growth forms (e.g. sedge, dwarf shrub, forb, etc.), site moisture regimes (dry, moist, wet, or aquatic), and physiognomy (e.g. tundra, sand dunes). Desktop analysis was then used to complete the vegetation mapping effort, and included an analysis of determination point data, existing vegetation mapping, NWI mapping, aerial photographs and surface hydrology data. USFWS NWI (Cowardin 1979) class codes, and hydrologic modifiers, were also assigned to each wetland polygon.

Desktop analysis was used to complete the vegetation mapping effort and included an analysis of determination point data, existing vegetation mapping, NWI mapping, aerial photographs and surface hydrology data. The following data relevant to project vegetation, soils, and hydrology was reviewed by OASIS:

- 1-foot resolution orthophotography;
- 1:6000 topographic mapping;
- Surface hydrology flow vectors (Alaska Clean Seas [ACS, 2010]);
- U.S. Fish & Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping;
- Field Indicators of Hydric Soils in Alaska (USDA-NRCS, 2005);
- National List of Plant Species That Occur in Wetlands (USFWS)

 Other supporting literature, reference materials and data are listed in the Reference Cited section.

Detailed surface hydrology data (ACS, 2010) were reviewed to determine connections between wetlands and waters within the assessment area. ACS (2010) interpreted surface flow vectors from 1:6,000 topographic maps. These data indicate surface water flow connections between wetlands and waters likely during the early growing season, when the water table is high or possible connections later in the growing season during precipitation events.

USFWS NWI mapping was downloaded from the official NWI web site and reviewed for initial assessment and background information (NWI 2012). These NWI maps, created from aerial photo interpretation with limited ground-truthing, are useful for identifying relatively large and obvious wetland areas for planning purposes. Due to the scale at which available NWI mapping maps were created (typically 1:63,360) and the limited correlation with conditions on the ground, some wetlands could be missed. In addition, the scale of the NWI maps is usually not sufficient to determine accurate wetland boundaries in the field, though it does provide a guide to the location of major wetland areas.

OASIS also collected soils and hydrology data in accordance with the currently accepted methods for wetland determination in Alaska, described in the Regional Supplement. This 'three parameter approach' employed in wetland determination requires the three essential characteristics of wetlands (hydrophytic vegetation, hydric soils, and wetland hydrology) be present to have a positive wetland determination. Wetland delineation data sheets and photo documentation were completed for each sample location visited in 2011. Datasheet from the 2011 field effort are provided in Appendix C and representative photos are provided in Appendix D. The location of wetland determination points and other notable features were recorded with a Trimble GeoXH 2005 series Global Positioning System (GPS) unit.

For the purposes of mapping within the project area, wetland or vegetation types were based on the predominant ecosystem and vegetation of the wetland as a whole and not necessarily narrow bands or inclusions of other wetland/vegetation types or uplands. Most habitat in the project area consisted of mosaics of wetland/vegetation types. Dominant vegetation types were typically used to characterize habitats, but sometimes a combination of vegetation types was used to describe habitat within the project area, with multiple vegetation communities comprising a single wetland type.

2.2. Jurisdictional Determination

To determine the potential JD categories appropriate for wetlands and waters within the assessment area, OASIS reviewed existing data including aerial photographs, topography, and detailed surface hydrology inferred from topographic maps (ACS, 2010). This review was performed in consultation with federal guidance, including *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States (June 5, 2007); U.S. Army Corps of Engineers*

Jurisdictional Determination Form Instructional Guidebook and Approved Jurisdictional Determination Form (May 30. 2007); and SPN 2010-45 (January 29, 2010).

Per these guidance documents, agencies will assert jurisdiction over the following categories of water bodies:

- Traditional Navigable Waters (TNWs);
- all wetlands adjacent to TNWs;
- non-navigable tributaries to TNWs that are relatively permanent (RPWs)¹; and
- wetlands that directly abut such tributaries².

Agencies will also assert jurisdiction over every water body that is not an RPW if that water body is determined to have a significant nexus with a TNW. These include the following water bodies:

- non-navigable tributaries that do not typically flow year-round or have continuous flow at least seasonally;
- wetland adjacent to such tributaries; and
- wetlands adjacent to but that do not directly abut a relatively permanent, nonnavigable tributary.

TNWs were determined through review of the Alaska Department of Natural Resources (ADNR) Navigable Waters website mapping tool (ADNR, 2010).

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¹ RPWs are tributaries that typically flow year-round or have continuous flow at least seasonally (USACE 2007a).

² A wetland abuts a tributary if it is not separated from the tributary by uplands, a berm, dike or similar feature (USACE 2007a).

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3. IMPORTANT FINDINGS

Wetlands within the assessment area are classified as Palustrine, Riverine and Lacustrine by the existing USFWS NWI mapping (NWI, 2012). The predominant USFWS (NWI, 2012) classification in the assessment area is PEM1/SS1B with smaller areas of PEM1E, PEM1/SS1E, PEM1/USE, PABH, PUBH, L1UBH and R2US/UB. Wetlands within the assessment area are surrounded by and connected to larger wetland systems. Palustrine systems are connected to the east and south, a riverine system runs south to north immediately west of the assessment area (Miluveach River), and large lacustrine wetlands are located to the north of the assessment area with smaller lacustrine wetlands scattered throughout the central portion of the area.

The following provides a summary of the wetland areas that are likely within the jurisdiction of Section 404 of the CWA. This determination was based on the location of wetlands relative to TNWs and RPWs and their hydrologic linkage to those water bodies.

3.1. Determination and Mapping

A total of 2,014.0 acres were assessed in support of the proposed Mustang Development Project and of this amount, 2,010.8 acres were classified and mapped as wetlands. A pingo, located within the proposed project corridor is classified as upland habitat (1.4 acres) and 1.8 acres of previously placed gravel fill for the Tarn/Meltwater Road are located in the proposed and alternative corridors, which comprise the remaining non-wetland acreage. Wetland features were delineated as distinct vegetation communities following Walker (1983) and are depicted in maps provided in Appendix B. Classified vegetation types are listed in Table 1 with their cumulative area, percent cover mapped within the proposed corridor and pad and the alternative project corridor, as well as a description of the vegetation type and the associated data point(s). Note that the 30 data points were initially distributed throughout the assessment area, however with new revisions of the project area, several data points are now located outside the original assessment area.

Vegetation communities include those associated with rivers, streams, lakes and ponds, and palustrine scrub-shrub/emergent wetlands. Non-wetland (pingo) or unknown/disturbed communities (placed gravel) make up a very small portion of the overall vegetation survey area (less than 1%). Individual Data Forms for Routine Wetland Delineations from each determination point are presented in Appendix B along with select photographs from each determination point in Appendix D.

Additionally, field observations, vegetation characterization, landscape and plot-investigations were used to further describe wetlands. Wetlands were often present as a mixture of vegetation types distributed across a microlandscape; distinct boundaries between wetland types were not always discernable. Using Walker's (1983) classification method, twelve distinct vegetation classifications [and one for gravel fill (Xe)] were identified in the investigation area (Table 1 in Section 3).

3.2. Assessment Area Vegetation Classifications

3.2.1. Water (la)

Areas classified as Walker Type Ia account for approximately 70.4 acres, comprising 3.5% of the assessment area. This vegetation type was further parsed into three water codes, streams/rivers (Ia2) (4.4 acres, 0.2%), lakes (lentic habitats greater than 20 acres, Ia3) (0.8 acres, 0.04%), and ponds (lentic habitats less than 20 acres, Ia4) (65.1 acres, 3.2%). All of the rivers/streams or riverine habitat are associated with the Miuveach River on the western edge of the assessment area, while the pond and lake communities are located throughout the assessment area. All Walker Type 1a wetlands are permanently flooded during the open water season, although some of the riverine habitats may become dry gravels during dry conditions present late in the summer season. The substrate in this type of habitat is generally unconsolidated with little to no vegetation. No determination points were established in this habitat type.

A long-tailed duck (*Clangula hyemalis*) with a brood of three was observed in this habitat type (lake) and unidentified fish species were observed in the Miluveach River during field investigations.



PHOTOGRAPH 1: OPEN WATER HABITAT LOCATED NEXT TO PROPOSED PRODUCTION PAD SITE (ADJACENT TO DP B4)

3.2.2. Shallow Water (IIa)

This habitat type occurs sporadically throughout the assessment area and in alternative corridors as shallow lakes and ponds. Total acreage is 26.7 acres, comprising 1.3% of the assessed area. These areas are permanently flooded during the open water season, although edges of the habitat may become exposed mud during dry conditions present late in the summer season. The substrate in this type of habitat is generally unconsolidated with little to no vegetation. No determination points were established in this habitat type.



PHOTOGRAPH 2: SHALLOW WATER HABITAT (LOCATED SOUTH OF DP B21)

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3.2.3. Water/Tundra Complex (IId)

This habitat type was mapped in one area near the eastern edge of the assessment area adjacent to a large lake, located in a larger depressional basin. Total area is 4.2 acres, comprising 0.2% of the assessed area. Standing water was present throughout with emergent vegetation and small ponds. *Carex aquatilis* was the dominant vegetation with very few species other than this aquatic sedge. Although no determination points were established in this habitat type, it was investigated as part of DP B18 which is located on the fringe of this mapped polygon.

Greater white-fronted geese (*Anser albifrons*), red-necked phalarope (*Phalaropus lobatus*), and glaucous gulls (*Larus hyperboreus*) were observed on-site in this habitat.



PHOTOGRAPH 3: WATER/TUNDRA COMPLEX HABITAT (LOCATED ADJACENT TO DP B18)

3.2.4. Wet Sedge Tundra (Illa)

This vegetation community is found in isolated pockets throughout the assessment area. Cumulative acreage of this habitat type is 68.4 acres, comprising 3.4% of the assessed area. It typically contained standing water or super-saturated tundra with emergent vegetation. Sedges (*Carex aquatilis* and *C. saxatilis*) and cotton grass (*Eriophorum angustifolium*) were the dominant plants found in this habitat type with prostrate willows (*Salix* sp.), lousewort (*Pedicularis sedetica*), and avens (*Dryas integrifolia*) occupying topographic micro-highs. The substrate was found to be mostly loam. Determination points B4, B7 and B18 were located in this habitat type.

Caribou (*Rangifer tarandus*), and Lapland longspur (*Calcarius lapponicus*) were observed in this habitat type.



PHOTOGRAPH 4: WET SEDGE TUNDRA HABITAT (LOCATED AT DP B7)

3.2.5. Wet Sedge Tundra/Water Complex (IIIc)

This habitat type is common in the assessment area, especially in the central portion, but also found in the floodplain of the Miluveach River. Total area is 344.5 acres, comprising 17.1% of the assessed area. Ponds intermixed with sedge flats typified this community, often with standing water or super-saturated tundra between the ponds, which is found in lower areas (topographically) and broad draws. Cottongrass (*Eriophorum angustifolium*) and sedges (*Carex aquatilis*, *C. saxatilis*, *C. podocarpa*) were dominant plant species with avens (*Dryas integrifolia*) and willows (*Salix reticulate*, *S. arctica*, *S. planifolia*) occupying topographic micro-highs. Determination points B1, B8, B11, B12, B22, and B28 were located in this habitat type.

Caribou (*Rangifer tarandus*), Lapland longspurs (*Calcarius lapponicus*), American golden plover (*Pluvialis dominica*), willow ptarmigan (*Lagopus lagopus*) and parasitic jaegers (*Stercorarius parasiticus*) were observed in this habitat type during site investigations.



PHOTOGRAPH 5: WET SEDGE TUNDRA/WATER COMPLEX (AT DP B22)

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3.2.6. Wet Sedge/Moist Sedge Dwarf Shrub Tundra Complex (IIId)

This habitat type is the most common type of habitat mapped in the assessment area. Total area is 670.1 acres, comprising 33.3% of the assessed area. Sedges (*Carex* sp.) intermixed with prostrate willows (*Salix* sp.) and avens (*Dryas* sp.) in a patterned ground complex typified this community. Standing water or super-saturated tundra was commonly present in troughs with drier, slightly elevated areas spaced throughout, although saturated soil conditions were always present within a couple inches of the soil surface (regardless of micro-topography). The soils were typically loamy sand. Determination points B6, B10, B13, B14 and B21 were located in this habitat type.

An unidentified jaeger (*Stercorarius* sp.) was observed hunting in this habitat type and an unidentified vole and semipalmated sandpiper (*Calidris pusilla*) were also observed.



PHOTOGRAPH 6: TYPICAL WET SEDGE/MOIST SEDGE DWARF SHRUB TUNDRA COMPLEX

3.2.7. Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (IVa)

This is a common type of habitat mapped in the assessment area comprising 584.8 acres, or 29.0% of the assessment area, existing mostly as large, broad areas surrounding the wetter and drier tundra areas. A complex vegetation community exists, created by the variable micro-topography and patterned ground that is typical of this habitat within the assessment area. Sedges (*Carex* sp.), cotton grass (*Eriophorum* sp.), and avens (*Dryas* sp.) are the most common types of plants. Soils are typically sandy loams with the water table or permafrost typically around 15 inches of the ground surface. Standing water existed occasionally and sporadically throughout this habitat during the assessment with saturated soils ranging from 0 to 10 inches below the ground surface. Lichens are more common in this community type than in the communities described above. Determination points B17, B19, B20, B24, B29 and B30 were located in this habitat type.

Caribou (*Rangifer tarandus*), parasitic jaeger (*Stercorarius parasiticus*), American golden plover (*Pluvialis dominica*), Lapland longspurs (*Calcarius lapponicus*), greater white-fronted geese (*Anser albifrons*), glaucous gulls (*Larus hyperboreus*), willow ptarmigan (*Lagopus lagopus*), and unidentified microtines were observed in this habitat type.



PHOTOGRAPH 7: MOIST SEDGE, DWARF SHRUB/WET GRAMINOID TUNDRA COMPLEX (LOWER LEFT HALF OF PHOTO – LOCATED SOUTHEAST OF DP B8)

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3.2.8. Moist Sedge, Dwarf Shrub Tundra (Va)

This moist to dry tundra habitat exists mostly in the eastern and western ends of the assessment area in areas that are relatively well drained. A total of 25.2 acres, or 1.3% of the area assessed was mapped as this community type. The substrate is a mixture of loam, sand, clay and organics. The water table was encountered at least 12 inches below the surface, although isolated surface water was observed in small ponds and trenches. Saturated soils ranged from 0 to 10 inches below the ground surface. Sedges (*Carex* sp.) and cottongrass (*Eriophorum* sp.) were common with prostrate willows (*Salix* sp.) and avens (*Dryas* sp.) comprising a greater percentage of the plant communities than in tundra habitats described above. Determination points B2, B5, B25, and B26 were located in this habitat type.

A brown bear (*Ursus arctos*), caribou (*Rangifer tarandus*), and buff-breasted sandpiper (*Tryngites subruficollis*) were observed in this habitat type.



PHOTOGRAPH 8: MOIST SEDGE, DWARF SHRUB TUNDRA (AT DP 26)

3.2.9. Moist Tussock Sedge, Dwarf Shrub Tundra (Vb)

This moist to dry tundra habitat type occurred in large, discrete polygons of the assessment area, and was also a minor component of other complex habitat types. Total area is 196.6 acres, or 9.8% of the assessed area. This community type contains a high degree of micro-topography with tussocks being a dominant feature, created mostly by *Eriophorum vaginatum*. Other common plants were *Dryas integrifolia*, *Cassiope tetragona*, *Salix reticulata*, and grasses (*Calamagrostis purpurascens*, *Poa arctica*). White, crustose lichens were also prevalent on top of micro-highs. Saturated soils were below the soil surface (≥2 inches below ground surface [bgs]) and the water table was not encountered in test pits (permafrost ranged from 10 to 16 inches bgs). Soils are typically loamy sand or silt loams. Determination points B3, B9, B16 and B23 were located in this tundra type.

Caribou (*Rangifer tarandus*), buff-breasted sandpiper (*Tryngites subruficollis*), and American golden plover (*Pluvialis dominica*) were observed in this tundra habitat.



PHOTOGRAPH 9: MOIST TUSSOCK SEDGE, DWARF SHRUB TUNDRA (AT DP B9)

3.2.10. Dry Dwarf Shrub, Crustose Lichen Tundra (Vc)

This tundra habitat occurs as an upland and wetland habitat and exists infrequently in the assessment area atop a pingo (upland), in the central portion of the assessment area. Total area is 1.4 acres, comprising 0.1% of the assessed area. Soils were relatively dry and well drained with live roots reaching up to 12 inches below ground surface. *Dryas integrifolia* dominated the plant communities and white crustose lichens were prevalent. Determination point B15 was located in this type of tundra habitat.

Multiple fox burrows were identified, especially west of DP B27 along the creek side bluff, and numerous owl (unidentified) pellets were located in this habitat near DP B15, atop the pingo.



PHOTOGRAPH 10: DRY DWARF SHRUB, CRUSTOSE LICHEN TUNDRA (AT DP B15 - ON PINGO)

3.2.11. Moist Graminoid, Dwarf Shrub Tundra/Barren Complex (Ve)

A total of 10.4 acres of this dry tundra habitat exists in well drained areas in the eastern portion of the assessment area, comprising 0.5% of the cover. *Dryas integrifolia, Carex rotundata, Salix reticulata*, and *Alapecurus alpinus* are common plants encountered in this habitat. Crustose and fruticose lichens were also prevelant. The substrate is loamy sand and sandy loam and saturated soils were found about 10 inches below ground surface. Determination point B27 was located in this tundra type.

Many ground squirrel (*Spermophilus parryii*) burrows were found in this type of habitat, especially between DPs B18 and B19, and caribou (*Rangifer tarandus*) were also observed.



PHOTOGRAPH 11: MOIST GRAMINOID, DWARF SHRUB TUNDRA/BARREN COMPLEX (AT DP B27)

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3.2.12. River Gravels (Xa)

River gravels occurred along the Miluveach River, west of the proposed production pad location and comprised a scant 7.8 acres, or 0.4% of the assessment area. With the exception of an occasional clump of sedges (*Carex* sp.), they were mostly devoid of vegetation. Caribou (*Rangifer tarandus*) tracks were quite common in the river gravels.



PHOTOGRAPH 12: RIVER GRAVELS (WEST OF PROPOSED PAD – MILUVEACH RIVER)

3.2.13. Gravel Roads and Pads (Xe)

Approximately 1.8 acres of previously placed gravel fill exists in the eastern portion of the assessment Area along the Tarn/Meltwater Road. Existing gravel roads and pads cover approximately 0.1% of the assessed area. The vegetation and tundra habitat type beneath the fill are unknown and the gravels are barren of vegetation for the most part.

3.2.14. Wet Mud (XIa)

Small pockets of exposed wet mud are scattered throughout the eastern portion of the assessment area for a total of 1.8 acres, or 0.1% of the assessed area. Areas if exposed mud were largely devoid of vegetation. No data points were taken within this community type.

TABLE 1: VEGETATION AND WETLAND TYPES OF THE MUSTANG DEVELOPMENT PROJECT ASSESSMENT AREA, ALASKA

				Area Mapped (Acres)						
Walker Classification Level C	Description	NWI Class/ Subclass	NWI Hydro Modifier	Cumulative Are		Proposed Project Corridor				Vegetation Community Description & Wetland Datapoints
				Acres	Percent	Acres	Percent			
la2	Rivers/streams	R2UB	Н	4.4	0.2%	2.4	0.1%	Streams and rivers upstream from ocean-derived salinity, including reaches subject to tides. Wetland Datapoints: None		
la3	Lakes: waterbodies >20 acres	L1UB	Н	0.8	0.0%	0.0	0.0%	Freshwater lakes greater than 20 acres. Wetland Datapoints: None		
la4	Ponds: waterbodies > 20 acres, lacking vegetation	PUB	Н	65.1	3.2%	19.7	1.0%	Freshwater ponds less than 20 acres. Wetland Datapoints: None		
lla	Shallow water: shallow ponds w/aquatic vegetation	PAB	Н	26.7	1.3%	13.5	0.7%	Very wet tundra/shallow ponds or pond margins. Little to no vegetation. Wetland Datapoints: None		
Ild	Water/Tundra Complex (pond complex)	PEM1	F	4.2	0.2%	1.5	0.1%	Water/Tundra Complex (inter-connected ponds with emergent vegetation). Lacustrine (L2UB/EM2H) and Palustrine (PUB/EM2H) Complexes of Open Water and Emergent Vegetation. Wetland Datapoints: None		
Illa	Wet Sedge Tundra	PEM1	E, F, H	68.4	3.4%	52.9	2.6%	Wet Sedge Tundra Palustrine Saturated Wet Sedge Meadows (PEM1B, PEM1E). Wet Sedge Meadows may be Permanently or Semi-Permanently Flooded (PEM1H, PEM1F). Wetland Datapoints: B4, B7, B18		
IIIc	Wet Sedge Tundra/Water Complex (pond complex)	PEM1/AB	F, H	344.5	17.1%	166.2	8.3%	Wet Sedge Tundra/Water Complex (inter-connected ponds). Lacustrine (L2EM2/UBH) and Palustrine (PEM1/UBH) Complexes of Emergent Vegetation and Open Water. Wetland Datapoints: B1, B8, B11, B12, B22, B28		
IIId	Wet Sedge/Moist Sedge. Dwarf Shrub Tundra Complex (wet patterned-ground complex)	PEM1/SS1	B, E, F	670.1	33.3%	534.0	26.5%	Wet Sedge/Moist Sedge, Dwarf Shrub Tundra Complex (wet patterned-ground complex). Complexes of Palustrine Scrub Shrub, Wet Sedge Meadows (PSS/EM1B) and Saturated Wet Sedge Meadows (PEM1B, PEM1E). Wet Sedge Meadows may be Permanently or Semi-Permanently Flooded (PEM1H, PEM1F). Wetland Datapoints: B6, B10, B13, B14, B21		
IVa	Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (moist patterned-ground complex)	PEM1/SS1	B, E	584.8	29.0%	368.1	18.3%	Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (moist patterned-ground complex). Complexes of Palustrine Scrub Shrub, Wet Sedge Meadows (PSS/EM1B) and Saturated Wet Sedge Meadows (PEM1E). Wet Sedge Meadows may be Permanently or Semi-Permanently Flooded (PEM1H, PEM1F). Wetland Datapoints: B17, B19, B20, B29, B30, B24*		
Va	Moist Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	25.2	1.3%	25.2	1.3%	Moist Sedge, Dwarf Shrub Tundra. Palustrine Saturated Shrub Emergent Wetlands (PSS/EM1B). Wetland Datapoints: B2, B5, B25*, B26*		
Vb	Moist Tussock Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	196.6	9.8%	121.9	6.1%	Moist Tussock Sedge, Dwarf Shrub Tundra. Palustrine Saturated Emergent and Scrub Shrub Wetlands (PEM/SS1B). Wetland Datapoints: B3, B9, B16, B23		
Vc	Dry Dwarf Shrub, Crustose Lichen Tundra (Dryas tundra)	U		1.4	0.1%	0.5	0.0%	Dry Dwarf Shrub, Crustose Lichen Tundra (<i>Dryas</i> tundra, pingos). Uplands or wetlands. Wetland Datapoints: B15		
Ve	Moist Graminoid, Dwarf Shrub Tundra/Barren Complex (frost-scar complex)	PSS1/EM1	В	10.4	0.5%	8.6	0.4%	Moist Graminoid, Dwarf Shrub Tundra/Barren Complex (frost-scar tundra complex). Palustrine Saturated Scrub Shrub Emergent Wetlands (PSS/EM1B). Wetland Datapoints: B27*		
Xa	River Gravels	R2US	С	7.8	0.4%	4.5	0.2%	River Gravels. Riverine, Seasonally Flooded Areas (R2USC, R3USC). Wetland Datapoints: None		
Xe	Gravel Roads and Pads	U		1.8	0.1%	1.8	0.1%	Gravel Roads and Pads. Upland/Unknown. Wetland Datapoints: None		
Xla	Wet Mud	PUB	E	1.8	0.1%	0.0	0.0%	Wet, exposed mud. Largely unvegetated. Wetland Datapoints: None		
Totals				2014.0	100.0%	1320.8	65.6%			

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3.3. Potential Jurisdictional Status

For the purposes of making a JD for the assessment area, only those areas mapped as wetlands were evaluated for their jurisdictional status. All wetlands within the assessment area are believed to fall under potential CWA jurisdiction based on either observation or inference of hydrologic connections linking these wetlands with a TNW via a RPW. The TNW associated with project area wetlands is the Colville River which flows into the Beaufort Sea to the north. The navigability status of the Miluveach River is 'unknown' according to the ADNR Navigable Waters website mapping tool. For the purpose of this report, we are assuming the Miluveach is considered an RPW. Hydrologic data for the Miluveach was not available for this report; however flowing water is readily seen in the project aerials taken on July 10, 2010, which suggests continuous seasonal flow. Figures showing hydrologic connections to TNWs (in Appendix B) and a "Multiple Waters Spreadsheet" and supporting JD information (in Tables attachment) has been prepared to summarize the jurisdictional status of the wetlands and waters within the assessment area. A Preliminary JD Form has also been prepared for the assessment area wetlands as supporting documentation for this report (Appendix F). All wetlands within the assessment area are considered to fall into the following JD category:

- A RPW (Miluveach River) that flows directly into a TNW (Colville River).
- Wetlands abutting an RPW with continuous seasonal flow (Miluveach River) that flows directly into a TNW (Colville River). Assessment area wetlands are contiguous and directly abut the Miluveach River. They have a direct hydrologic connection to the Miluveach River (RPW) and ultimately to the Colville River (TNW) through seasonal flooding, continuous soil saturation, or shallow groundwater.

Detailed surface hydrology data were reviewed to determine connections between assessment area wetlands and the Miluveach River (RPW) and Colville River (TNW) (ACS 2010). ACS technicians manually interpreted surface flow vectors through review of detailed North Slope topography, identifying surface water flow paths between wetlands and waters. ACS surface hydrology data for the assessment area is represented by surface water flow vectors shown on the wetland maps in Appendix A. Data were evaluated beyond the assessment area to determine connections to TNWs. Surface water flow vectors for the western portion of the site are clearly directed toward the Miluveach River, while surface water flow vectors for the eastern portion of the site are more ambiguous and generally trend toward the Miluveach River as it approaches the Colville River. For the purposes of this JD report, we are reporting that all project area wetlands have a primary hydrologic connection to the Miluveach River.

In addition to potential surficial connections, wetlands within the ACP are also expected to have a hydrologic connection to TNWs through adjacent soil saturation. This condition can extend into adjacent wetlands for extended distances before encountering an RPW

or TNW, and can link seemingly "isolated" wetlands to streams and rivers that flow into large TNWs, and eventually the Beaufort Sea.

- Wetlands in the following categories were not identified in the assessment area:
- Wetlands adjacent (not abutting) RPWs that flow directly or indirectly into TNWs*
- Wetlands adjacent (not abutting) to non-RPWs that flow directly or indirectly into TNWs*
- Isolated wetlands*
 - * These designations require a significant nexus determination.

Because these categories are not asserted, a technical determination of a significant nexus is not presented.

4. CONCLUSIONS

OASIS conducted a wetland delineation on behalf of the Brooks Range Petroleum Company within the proposed Mustang Development project area located in the Southern Miluveach Unit and adjacent to the western boundary of the Kuparuk River Unit. The purpose of the wetland delineation and evaluation work is to identify areas of the proposed project that are within the jurisdiction of Section 404 of the Clean Water Act (CWA) as interpreted by the "Alaska District" U. S. Army Corps of Engineers (Corps). Wetland determinations were performed by experienced wetland scientists according to the 1987 Corps of Engineers Wetland Delineation Manual (Corps Manual) (USACE 1987) and the Alaska Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (USACE 2007b). Field work was conducted in August 2011, and final desktop analysis using GIS and aerial photography was completed in June 2012.

A total of 2,014.0 acres were assessed in support of the proposed Mustang Development Project and of this amount, 2,010.8 acres were classified and mapped as wetlands. Wetlands were mapped to Level C of Walker's (1983) vegetation classification system. It is OASIS's professional opinion that the wetlands within the assessment area fall under the jurisdiction of Section 404 of the Clean Water Act as interpreted by the "Alaska District" U. S. Army Corps of Engineers. This is based on OASIS's JD analysis in which it was determined that 1) the Miluveach River is a RPW with continuous seasonal flow that flows directly to the Colville River, a TNW; and 2) all of the assessment area wetlands abut the Miluveach River. Assessment area wetlands have a direct hydrologic connection to the Miluveach River (RPW) and ultimately to the Colville River (TNW) through seasonal flooding, continuous soil saturation, or shallow groundwater.

OASIS, on behalf of BRPC, requests an Approved Jurisdictional Status Determination by the Corps based on the data and recommendations provided in this report. - Page Intentionally Left Blank -

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TABLES

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Waters_Name	Cowadin_Code HGM_Code	Measurement_Type	Amount	Units	Waters_Types	Latitude	Longitude	Local_Waterway
Miluveach River	R2UB	AREA		ACRE	RPW	70.2504	-150.2970	,
Miluveach River	R2UB	AREA		ACRE	RPW	70.2558	-150.3087	
Miluveach River	R2US	AREA		ACRE	RPW	70.2490	-150.2918	
Miluveach River	R2US	AREA		ACRE	RPW	70.2480	-150.2942	
Miluveach River	R2US	AREA		ACRE	RPW	70.2497	-150.2939	
Miluveach River	R2US	AREA		ACRE	RPW	70.2512	-150.2974	
Miluveach River	R2US	AREA		ACRE	RPW	70.2553	-150.3087	
Miluveach River	R2US	AREA		ACRE	RPW	70.2520	-150.3035	
Miluveach River	R2US	AREA		ACRE	RPW	70.2570	-150.3107	
Miluveach River	L1UB	AREA		ACRE	RPWWD	70.2535	-150.2252	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2708	-150.1364	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2480	-150.2702	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2681	-150.1672	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2531	-150.2190	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2430	-150.2801	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2442	-150.2782	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2455	-150.2833	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2484	-150.2964	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2507	-150.3014	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2545	-150.1662	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2551	-150.1650	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2554	-150.1753	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2557	-150.1627	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2572	-150.1573	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2577	-150.1524	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2479	-150.2492	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2487	-150.2478	
Miluveach River	PAB PAB	AREA		ACRE ACRE	RPWWD RPWWD	70.2485	-150.2452 -150.2359	
Miluveach River Miluveach River	PAB	AREA AREA		ACRE	RPWWD	70.2499 70.2503	-150.2359	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2512	-150.2386	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2514	-150.2367	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2603	-150.1666	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2608	-150.1641	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2620	-150.1641	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2627	-150.1607	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2639	-150.1659	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2646	-150.1676	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2652	-150.1551	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2672	-150.1569	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2675	-150.1580	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2591	-150.1642	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2599	-150.1675	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2637	-150.1908	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2688	-150.1640	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2696	-150.1556	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2650	-150.1459	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2558	-150.1942	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2555	-150.1908	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2554	-150.1774	
Miluveach River	PAB	AREA		ACRE	RPWWD	70.2699	-150.1145	
Miluveach River	PEM1	AREA		ACRE	RPWWD	70.2718	-150.1290	
Miluveach River	PEM1	AREA		ACRE	RPWWD	70.2498	-150.2794	
Miluveach River	PEM1	AREA		ACRE	RPWWD	70.2487	-150.2283	
Miluveach River	PEM1	AREA		ACRE	RPWWD	70.2577	-150.1743	
Miluveach River	PEM1	AREA		ACRE	RPWWD	70.2716	-150.1266	
Miluveach River	PEM1	AREA		ACRE	RPWWD	70.2719	-150.1402	
Miluveach River	PEM1	AREA		ACRE	RPWWD	70.2724	-150.1441	
Miluveach River	PEM1	AREA		ACRE	RPWWD	70.2698	-150.1161	
Miluveach River	PEM1	AREA		ACRE	RPWWD	70.2713	-150.1347	
Miluveach River	PEM1	AREA		ACRE	RPWWD	70.2665	-150.1704	
Miluveach River	PEM1	AREA		ACRE	RPWWD	70.2552	-150.2031	
Miluveach River	PEM1	AREA		ACRE ACRE	RPWWD	70.2574	-150.1812	
Miluveach River	PEM1	AREA	17.60	ACKE	RPWWD	70.2687	-150.1650	

Waters_Name	Cowadin_Code	HGM_Code	Measurement_Type	Amount Units	Waters_Types	Latitude L	ongitude Local_Waterway
Miluveach River	PEM1		AREA	0.20 ACRE	RPWWD	70.2699	-150.1164
Miluveach River	PEM1		AREA	2.35 ACRE	RPWWD	70.2556	-150.3099
Miluveach River	PEM1		AREA	4.03 ACRE	RPWWD	70.2533	-150.3059
Miluveach River	PEM1		AREA	42.73 ACRE	RPWWD	70.2525	-150.2170
Miluveach River	PEM1		AREA	13.82 ACRE	RPWWD	70.2628	-150.1749
Miluveach River	PEM1		AREA	6.95 ACRE	RPWWD	70.2646	-150.1674
Miluveach River	PEM1		AREA	30.66 ACRE	RPWWD	70.2654	-150.1528
Miluveach River	PEM1		AREA	9.97 ACRE	RPWWD	70.2661	-150.1609
Miluveach River	PEM1		AREA	44.39 ACRE	RPWWD	70.2454	-150.2847
Miluveach River	PEM1		AREA	18.12 ACRE	RPWWD	70.2502	-150.2983
Miluveach River	PEM1		AREA	7.43 ACRE	RPWWD	70.2511	-150.2962
Miluveach River	PEM1		AREA	0.01 ACRE	RPWWD	70.2596	-150.1576
Miluveach River	PEM1		AREA	0.59 ACRE	RPWWD	70.2603	-150.1572
Miluveach River	PEM1		AREA	22.61 ACRE	RPWWD	70.2608	-150.1617
Miluveach River	PEM1		AREA	72.25 ACRE	RPWWD	70.2599	-150.1908
Miluveach River	PEM1		AREA	28.12 ACRE	RPWWD	70.2600	-150.3086
Miluveach River	PEM1		AREA	9.23 ACRE	RPWWD	70.2626	-150.3001
	PEM1		AREA	8.35 ACRE	RPWWD	70.2496	-150.2887
Miluveach River Miluveach River	PEM1		AREA	8.45 ACRE	RPWWD	70.2498	-150.2667
Miluveach River	PEM1		AREA	6.88 ACRE	RPWWD	70.2492	-150.1200
	PEM1	1	AREA	1.51 ACRE	RPWWD	70.2713	
Miluveach River Miluveach River	PEM1	1	AREA	134.71 ACRE	RPWWD	70.2569	-150.1658 -150.2813
	PEM1					70.2544	
Miluveach River Miluveach River	PEM1	1	AREA AREA	24.78 ACRE 8.48 ACRE	RPWWD RPWWD	70.2544	-150.2117 -150.1632
			AREA				
Miluveach River	PEM1			10.23 ACRE	RPWWD	70.2705	-150.1204
Miluveach River	PEM1		AREA	18.42 ACRE	RPWWD	70.2590	-150.1712
Miluveach River	PEM1		AREA	167.81 ACRE	RPWWD	70.2485	-150.2666
Miluveach River	PEM1		AREA	46.65 ACRE	RPWWD	70.2565	-150.2021
Miluveach River	PEM1		AREA	40.76 ACRE	RPWWD	70.2609	-150.1815
Miluveach River	PEM1		AREA	0.44 ACRE	RPWWD	70.2722	-150.1261
Miluveach River	PEM1		AREA	0.80 ACRE	RPWWD	70.2696	-150.1159
Miluveach River	PEM1		AREA	20.13 ACRE	RPWWD	70.2688	-150.1152
Miluveach River	PEM1		AREA	275.10 ACRE	RPWWD	70.2663	-150.1393
Miluveach River	PEM1		AREA	0.99 ACRE	RPWWD	70.2603	-150.1678
Miluveach River	PEM1		AREA	32.09 ACRE	RPWWD	70.2676	-150.1587
Miluveach River	PEM1		AREA	18.90 ACRE	RPWWD	70.2637	-150.1834
Miluveach River	PEM1		AREA	5.88 ACRE	RPWWD	70.2601	-150.1768
Miluveach River	PEM1		AREA	6.41 ACRE	RPWWD	70.2656	-150.1691
Miluveach River	PEM1		AREA	11.53 ACRE	RPWWD	70.2700	-150.1540
Miluveach River	PEM1		AREA	1.94 ACRE	RPWWD	70.2718	-150.1340
Miluveach River	PEM1		AREA	0.13 ACRE	RPWWD	70.2704	-150.1201
Miluveach River	PEM1		AREA	0.29 ACRE	RPWWD	70.2699	-150.1220
Miluveach River	PEM1		AREA	0.04 ACRE	RPWWD	70.2702	-150.1244
Miluveach River	PEM1		AREA	0.04 ACRE	RPWWD	70.2701	-150.1270
Miluveach River	PEM1		AREA	2.39 ACRE	RPWWD	70.2671	-150.1302
Miluveach River	PEM1		AREA	10.35 ACRE	RPWWD	70.2619	-150.3015
Miluveach River	PEM1		AREA	0.12 ACRE	RPWWD	70.2717	-150.1144
Miluveach River	PEM1		AREA	0.31 ACRE	RPWWD	70.2710	-150.1156
Miluveach River	PEM1		AREA	221.96 ACRE	RPWWD	70.2544	-150.2907
Miluveach River	PEM1		AREA	156.21 ACRE	RPWWD	70.2487	-150.2410
Miluveach River	PEM1		AREA	64.91 ACRE	RPWWD	70.2580	-150.2029
Miluveach River	PEM1		AREA	128.39 ACRE	RPWWD	70.2576	-150.1654
Miluveach River	PEM1		AREA	40.24 ACRE	RPWWD	70.2629	-150.1689
Miluveach River	PSS1		AREA	1.05 ACRE	RPWWD	70.2722	-150.1335
Miluveach River	PSS1		AREA	9.00 ACRE	RPWWD	70.2710	-150.1254
Miluveach River	PSS1		AREA	0.16 ACRE	RPWWD	70.2704	-150.1157
Miluveach River	PSS1		AREA	0.15 ACRE	RPWWD	70.2708	-150.1140
Miluveach River	PUB		AREA	0.26 ACRE	RPWWD	70.2523	-150.2069
Miluveach River	PUB		AREA	5.30 ACRE	RPWWD	70.2676	-150.1704
Miluveach River	PUB		AREA	1.74 ACRE	RPWWD	70.2718	-150.1410
Miluveach River	PUB		AREA	1.60 ACRE	RPWWD	70.2578	-150.1744
Miluveach River	PUB		AREA	2.61 ACRE	RPWWD	70.2631	-150.1959
Miluveach River	PUB		AREA	1.38 ACRE	RPWWD	70.2499	-150.2803

TABLE 2. SPN 2010-45 MULTIPLE WATERS TABLE

Waters_Name	Cowadin_Code	HGM_Code	Measurement_Type	Amount	Units	Waters_Types	Latitude	Longitude	Local_Waterway
Miluveach River	PUB		AREA	3.49	ACRE	RPWWD	70.2506	-150.2123	
Miluveach River	PUB		AREA	8.14	ACRE	RPWWD	70.2607	-150.1575	
Miluveach River	PUB		AREA	2.39	ACRE	RPWWD	70.2633	-150.1517	
Miluveach River	PUB		AREA	10.61	ACRE	RPWWD	70.2637	-150.1566	
Miluveach River	PUB		AREA	2.11	ACRE	RPWWD	70.2655	-150.1520	
Miluveach River	PUB		AREA	4.29	ACRE	RPWWD	70.2660	-150.1493	
Miluveach River	PUB		AREA	1.44	ACRE	RPWWD	70.2672	-150.1515	
Miluveach River	PUB		AREA	1.48	ACRE	RPWWD	70.2674	-150.1539	
Miluveach River	PUB		AREA	0.95	ACRE	RPWWD	70.2670	-150.1601	
Miluveach River	PUB		AREA	0.75	ACRE	RPWWD	70.2696	-150.1367	
Miluveach River	PUB		AREA	1.21	ACRE	RPWWD	70.2695	-150.1382	
Miluveach River	PUB		AREA	4.77	ACRE	RPWWD	70.2612	-150.1748	
Miluveach River	PUB		AREA	3.87	ACRE	RPWWD	70.2647	-150.1772	
Miluveach River	PUB		AREA	0.70	ACRE	RPWWD	70.2547	-150.1978	
Miluveach River	PUB		AREA	3.85	ACRE	RPWWD	70.2568	-150.1888	
Miluveach River	PUB		AREA	2.21	ACRE	RPWWD	70.2594	-150.1933	
Miluveach River	PUB		AREA	0.27	ACRE	RPWWD	70.2725	-150.1444	
Miluveach River	PUB		AREA	0.24	ACRE	RPWWD	70.2620	-150.1705	
Miluveach River	PUB		AREA	0.31	ACRE	RPWWD	70.2627	-150.1676	
Miluveach River	PUB		AREA	0.44	ACRE	RPWWD	70.2632	-150.1709	
Miluveach River	PUB		AREA	0.57	ACRE	RPWWD	70.2646	-150.1722	

Culvert Coordinates

		Distance from		
Culvert ID	Associated Road	Start of Road	Latitude (DD)	Longitude (DD)
Culvert 3+09	Proposed Access Road	309.03	70.2698	-150.1200
Culvert 6+04	Proposed Access Road	604.11	70.2698	-150.1224
Culvert 8+90	Proposed Access Road	890.41	70.2697	-150.1246
Culvert 12+81	Proposed Access Road	1281.43	70.2691	-150.1273
Culvert 17+13	Proposed Access Road	1713.03	70.2682	-150.1295
Culvert 18+81	Proposed Access Road	1881.33	70.2678	-150.1304
Culvert 20+76	Proposed Access Road	2076.46	70.2674	-150.1313
Culvert 22+46	Proposed Access Road	2246.24	70.2671	-150.1322
Culvert 24+55	Proposed Access Road	2455.17	70.2666	-150.1333
Culvert 30+03	Proposed Access Road	3003.08	70.2654	-150.1360
Culvert 34+24	Proposed Access Road	3424.12	70.2646	-150.1382
Culvert 35+71	Proposed Access Road	3571.08	70.2642	-150.1389
Culvert 37+15	Proposed Access Road	3715.04	70.2639	-150.1397
Culvert 41+13	Proposed Access Road	4113.19	70.2631	-150.1417
Culvert 49+51	Proposed Access Road	4951.04	70.2613	-150.1459
Culvert 50+76	Proposed Access Road	5076.40	70.2610	-150.1466
Culvert 52+11	Proposed Access Road	5211.14	70.2608	-150.1473
Culvert 58+80	Proposed Access Road	5880.14	70.2597	-150.1517
Culvert 64+61	Proposed Access Road	6461.18	70.2589	-150.1558
Culvert 68+15	Proposed Access Road	6815.34	70.2585	-150.1583
Culvert 89+25	Proposed Access Road	8925.03	70.2566	-150.1737
Culvert 93+61	Proposed Access Road	9361.06	70.2574	-150.1765
Culvert 108+14	Proposed Access Road	10814.22	70.2585	-150.1867
Culvert 116+71	Proposed Access Road	11671.02	70.2577	-150.1932
Culvert 122+68	Proposed Access Road	12268.29	70.2571	-150.1977
Culvert 130+56	Proposed Access Road	13056.23	70.2563	-150.2037
Culvert 155+06	Proposed Access Road	15506.36	70.2516	-150.2170
Culvert 170+75	Proposed Access Road	17075.16	70.2500	-150.2288
Culvert 201+93	Proposed Access Road	20193.12	70.2479	-150.2526
Culvert 203+30	Proposed Access Road	20330.46	70.2480	-150.2537
Culvert 210+17	Proposed Access Road	21017.26	70.2487	-150.2589
Culvert 213+28	Proposed Access Road	21328.13	70.2490	-150.2613
Culvert 214+98	Proposed Access Road	21498.45	70.2491	-150.2626
Culvert 220+61	Proposed Access Road	22061.22	70.2496	-150.2668
Culvert 227+97	Proposed Access Road	22797.05	70.2494	-150.2727
Culvert M1+71	Proposed Mine Road	171.18	70.2501	-150.2715
Culvert M9+08	Proposed Mine Road	908.48	70.2517	-150.2748
Culvert M17+78	Proposed Mine Road	1778.37	70.2531	-150.2805
Culvert M28+07	Proposed Mine Road	2807.09	70.2547	-150.2873
Culvert M35+08	Proposed Mine Road	3508.20	70.2558	-150.2920

NOTES:

¹⁾ The culverts are listed in order starting on the east end of the proposed road, near the TARN Road and continue south and west to the proposed gravel mine location.

2) A total of forty culverts (24" and 36" diameter) are slated to be installed along the proposed access and

mine road.

WETLAND DATAPOINT SUMMARY TABLE

Weltand	Walker				Location		
Datapoint ID	Classification Level C	Description	NWI Class/ Subclass	NWI Hydro Modifier	Latitude (dd)	Longitude (dd)	
B1	IIIc	Wet Sedge Tundra/Water Complex (pond complex)	PEM1/AB	F, H	70.2478	-150.2910	
B2	Va	Moist Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2490	-150.2894	
В3	Vb	Moist Tussock Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2481	-150.2854	
B4	Illa	Wet Sedge Tundra	PEM1	E, F, H	70.2494	-150.2790	
B5	Va	Moist Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2495	-150.2668	
B6	IIId	Wet Sedge/Moist Sedge. Dwarf Shrub Tundra Complex (wet patterned-ground complex)	PEM1/SS1	B, E, F	70.2485	-150.2467	
B7	Illa	Wet Sedge Tundra	PEM1	E, F, H	70.2494	-150.2308	
B8	IIIc	Wet Sedge Tundra/Water Complex (pond complex)	PEM1/AB	F, H	70.2541	-150.2179	
В9	Vb	Moist Tussock Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2556	-150.2087	
B10	IIId	Wet Sedge/Moist Sedge. Dwarf Shrub Tundra Complex (wet patterned-ground complex)	PEM1/SS1	B, E, F	70.2606	-150.1983	
B11	IIIc	Wet Sedge Tundra/Water Complex (pond complex)	PEM1/AB	F, H	70.2631	-150.1895	
B12	IIIc	Wet Sedge Tundra/Water Complex (pond complex)	PEM1/AB	F, H	70.2593	-150.1869	
B13	IIId	Wet Sedge/Moist Sedge. Dwarf Shrub Tundra Complex (wet patterned-ground complex)	PEM1/SS1	B, E, F	70.2567	-150.1774	
B14	IIId	Wet Sedge/Moist Sedge. Dwarf Shrub Tundra Complex (wet patterned-ground complex)	PEM1/SS1	B, E, F	70.2572	-150.1666	
B15	Vc	Dry Dwarf Shrub, Crustose Lichen Tundra (Dryas tundra)	U		70.2596	-150.1729	
B16	Vb	Moist Tussock Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2657	-150.1636	
B17	IVa	Tundra Campley (maist notterned ground	PEM1/SS1	B, E	70.2701	-150.1464	
B18	IIIa	Wet Sedge Tundra	PEM1	E, F, H	70.2709	-150.1263	
B19	IVa	Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (moist patterned-ground complex)	PEM1/SS1	В, Е	70.2695	-150.1264	

WETLAND DATAPOINT SUMMARY TABLE

Weltand	Walker				Loca	ntion
Datapoint ID	Classification Level C	Description	NWI Class/ Subclass	NWI Hydro Modifier	Latitude (dd)	Longitude (dd)
B20	IVa	Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (moist patterned-ground complex)	PEM1/SS1	B, E	70.2633	-150.1412
B21	IIId	Wet Sedge/Moist Sedge. Dwarf Shrub Tundra Complex (wet patterned-ground complex)	PEM1/SS1	B, E, F	70.2598	-150.1540
B22	IIIc	Wet Sedge Tundra/Water Complex (pond complex)	PEM1/AB	F, H	70.2447	-150.2817
B23	Vb	Moist Tussock Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2451	-150.2641
B24*	IVa	Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (moist patterned-ground complex)	PEM1/SS1	B, E	70.2393	-150.2501
B25*	Va	Moist Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2333	-150.2388
B26*	Va	Moist Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2268	-150.2317
B27*	Ve	Moist Graminoid, Dwarf Shrub Tundra/Barren Complex (frost-scar complex)	PSS1/EM1	В	70.2689	-150.0964
B28	IIIc	Wet Sedge Tundra/Water Complex (pond complex)	PEM1/AB	F, H	70.2624	-150.1741
B29	IVa	Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (moist patterned-ground complex)	PEM1/SS1	B, E	70.2624	-150.1788
B30	IVa	Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (moist patterned-ground complex)	PEM1/SS1	В, Е	70.2692	-150.1371

^{*}Datapoint was located within the original assessment area, but is not located within the smaller, revised assessment area.

APPENDIX A

Landowner Permission Letter







July 25, 2012

Ms. Mary Ramero U.S. Army Corps of Engineers Alaska District PO Box 6898 2204 3rd Street JBER, AK 99506-0898

RE: LANDOWNER PERMISSION TO ACCESS PROPERTY ASSOCIATED WITH JURISDICTIONAL DETERMINATION REQUEST FOR THE MUSTANG DEVELOPMENT PROJECT

Dear Ms. Ramero,

This landowner permission letter is being submitted in support of the approved jurisdictional determination request for the Mustang Field development project. Brooks Range Petroleum Company (BPRC) grants access to the U.S. Army Corps of Engineers to the Mustang Field project area for the purpose of reviewing the parcel for the approved jurisdictional determination. This letter grants permission to access the following location: USGS Quad Harrison Bay A1 and B1; 70.2590 N, -150.1840 W NAD83 datum; Township 10N, Range 7E; Township 10N, Range 7E; Township 11N, Range 8E of the Umiat Meridian (UM). The project area can be accessed via road travel or air. From Prudhoe Bay, the project site can be accessed through the greater Prudhoe Bay road infrastructure. Beginning at the Deadhorse Airport, follow the Spine Road to the wye intersection of the Oliktok and Tarn/Meltwater roads; then follow the Tarn/Meltwater Road until just southwest of the Kuparuk River Unit Drill Site 2 where the proposed Mustang Project access road will leave the Tarn/Meltwater Road and proceed west to the proposed project drilling and production pad. Total road travel is approximately 48 miles from the Deadhorse Airport to reach the proposed Mustang access road.

BPRC leases the Mustang Field property from the State of Alaska Department of Natural Resources. Per the terms of the lease agreement, BPRC can authorize access to the property without written consent from the State. As such, the leasee signature below provides authorization for agents representing the U.S. Army Corps of Engineers to access the Mustang Field property for the purpose stated above.

Signed, Mark Wiggin

Engineering and Development Manager Brooks Range Petroleum Company

510 L Street, Suite 601, Anchorage, AK 99516

(907) 339-9965

(Signature)

(Printed Name)

APPENDIX B

Wetlands, Waters and Vegetation Map Set



TNW and Assessment Area Map Supporting Information

- See Table 1. Wetland Summary Table and Table 2. SPN 2010-45 Multiple Waters Table in main report for a summary of wetland types, sizes, locations and relationship with TNW.
- Watershed size: Lower Colville River HUC is 19060304, the area is 2,764,148 acres
- Average annual precipitation ranges from 100 mm to 150 mm. Average annual temperature ranges from 13°C to -10°C. Freezing can occur in any month of the year.
- There are no existing culverts
- Tributaries on site: Miluveach River
 - o 15-20 river miles to nearest TNW (Colville River)
 - o 5-10 aerial miles to nearest TNW (Colville River)
 - o Miluveach substrate is gravel/cobble with sands.

WETLAND DATAPOINT SUMMARY TABLE

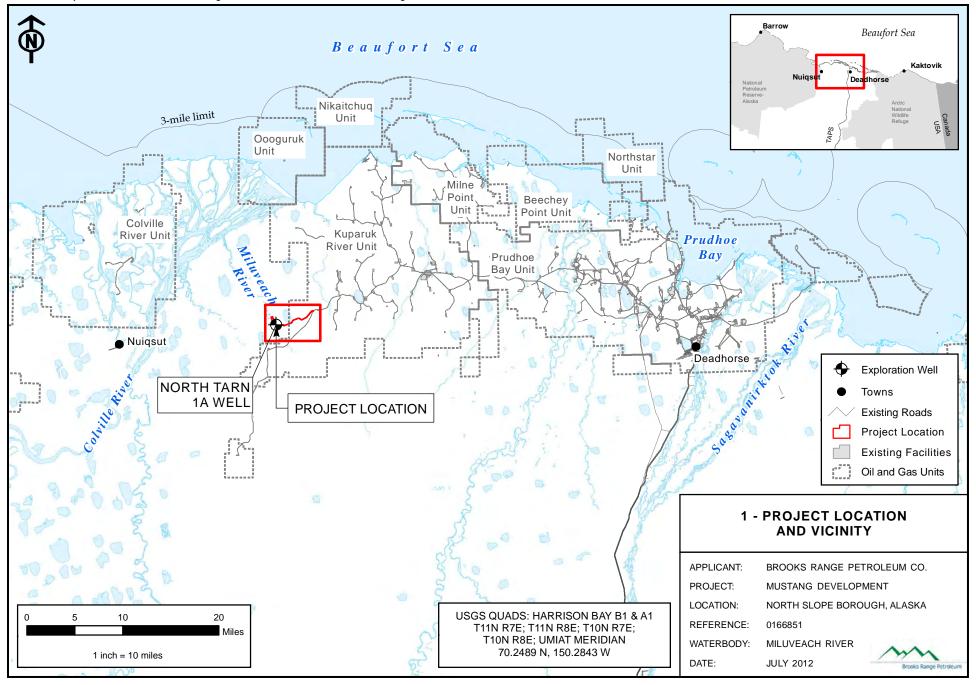
Weltand	Walker				Loca	ition
Datapoint ID	Classification Level C	Description	NWI Class/ Subclass	NWI Hydro Modifier	Latitude (dd)	Longitude (dd)
B1	IIIc	Wet Sedge Tundra/Water Complex (pond complex)	PEM1/AB	F, H	70.2478	-150.2910
B2	Va	Moist Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2490	-150.2894
В3	Vb	Moist Tussock Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2481	-150.2854
B4	Illa	Wet Sedge Tundra	PEM1	E, F, H	70.2494	-150.2790
B5	Va	Moist Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2495	-150.2668
В6	IIId	Wet Sedge/Moist Sedge. Dwarf Shrub Tundra Complex (wet patterned- ground complex)	PEM1/SS1	B, E, F	70.2485	-150.2467
B7	Illa	Wet Sedge Tundra	PEM1	E, F, H	70.2494	-150.2308
B8	IIIc	Wet Sedge Tundra/Water Complex (pond complex)	PEM1/AB	F, H	70.2541	-150.2179
В9	Vb	Moist Tussock Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2556	-150.2087
B10	IIId	Wet Sedge/Moist Sedge. Dwarf Shrub Tundra Complex (wet patterned- ground complex)	PEM1/SS1	B, E, F	70.2606	-150.1983
B11	IIIc	Wet Sedge Tundra/Water Complex (pond complex)	PEM1/AB	F, H	70.2631	-150.1895
B12	IIIc	Wet Sedge Tundra/Water Complex (pond complex)	PEM1/AB	F, H	70.2593	-150.1869
B13	IIId	Wet Sedge/Moist Sedge. Dwarf Shrub Tundra Complex (wet patterned- ground complex)	PEM1/SS1	B, E, F	70.2567	-150.1774
B14	IIId	Wet Sedge/Moist Sedge. Dwarf Shrub Tundra Complex (wet patterned- ground complex)	PEM1/SS1	B, E, F	70.2572	-150.1666
B15	Vc	Dry Dwarf Shrub, Crustose Lichen Tundra (Dryas tundra)	U		70.2596	-150.1729
B16	Vb	Moist Tussock Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2657	-150.1636

WETLAND DATAPOINT SUMMARY TABLE (CONT.)

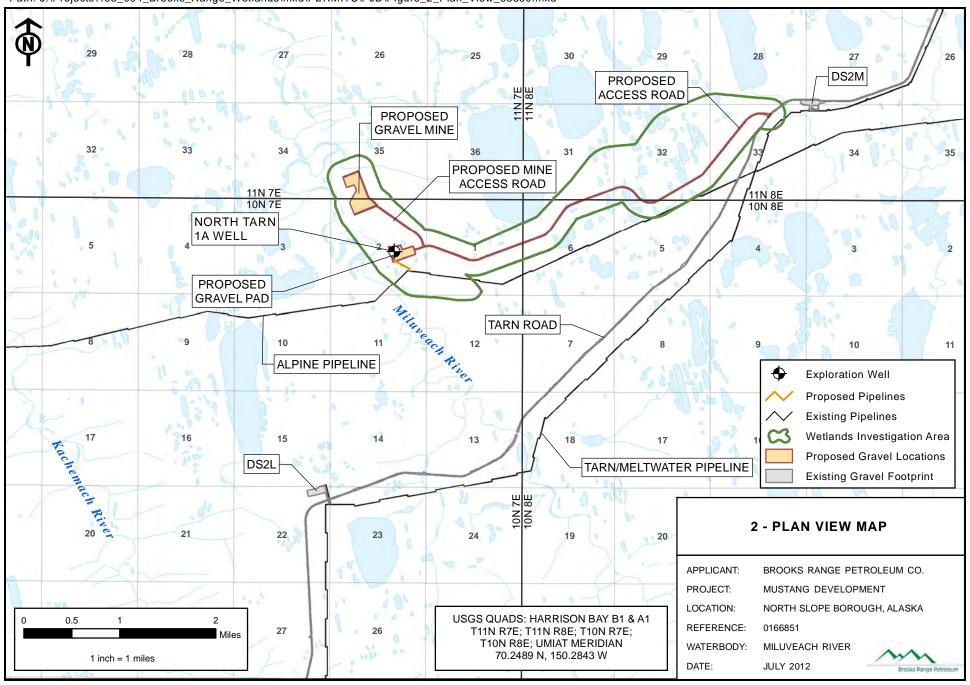
Weltand	Walker				Location		
Datapoint ID	Classification Level C	Description	NWI Class/ Subclass	NWI Hydro Modifier	Latitude (dd)	Longitude (dd)	
B17	IVa	Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (moist patterned-ground complex)	PEM1/SS1	B, E	70.2701	-150.1464	
B18	Illa	Wet Sedge Tundra	PEM1	E, F, H	70.2709	-150.1263	
B19	IVa	Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (moist patterned-ground complex)	PEM1/SS1	B, E	70.2695	-150.1264	
B20	IVa	Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (moist patterned-ground complex)	PEM1/SS1	В, Е	70.2633	-150.1412	
B21	IIId	Wet Sedge/Moist Sedge. Dwarf Shrub Tundra Complex (wet patterned- ground complex)	PEM1/SS1	B, E, F	70.2598	-150.1540	
B22	IIIc	Wet Sedge Tundra/Water Complex (pond complex)	PEM1/AB	F, H	70.2447	-150.2817	
B23	Vb	Moist Tussock Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2451	-150.2641	
B24*	IVa	Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (moist patterned-ground complex)	PEM1/SS1	В, Е	70.2393	-150.2501	
B25*	Va	Moist Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2333	-150.2388	
B26*	Va	Moist Sedge, Dwarf Shrub Tundra	PEM1/SS1	В	70.2268	-150.2317	
B27*	Ve	Moist Graminoid, Dwarf Shrub Tundra/Barren Complex (frost-scar complex)	PSS1/EM1	В	70.2689	-150.0964	
B28	IIIc	Wet Sedge Tundra/Water Complex (pond complex)	PEM1/AB	F, H	70.2624	-150.1741	
B29	IVa	Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (moist patterned-ground complex)	PEM1/SS1	В, Е	70.2624	-150.1788	
B30	IVa	Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (moist patterned-ground complex)	PEM1/SS1	В, Е	70.2692	-150.1371	

^{*}Datapoint was located within the original assessment area, but is not located within the smaller, revised assessment are

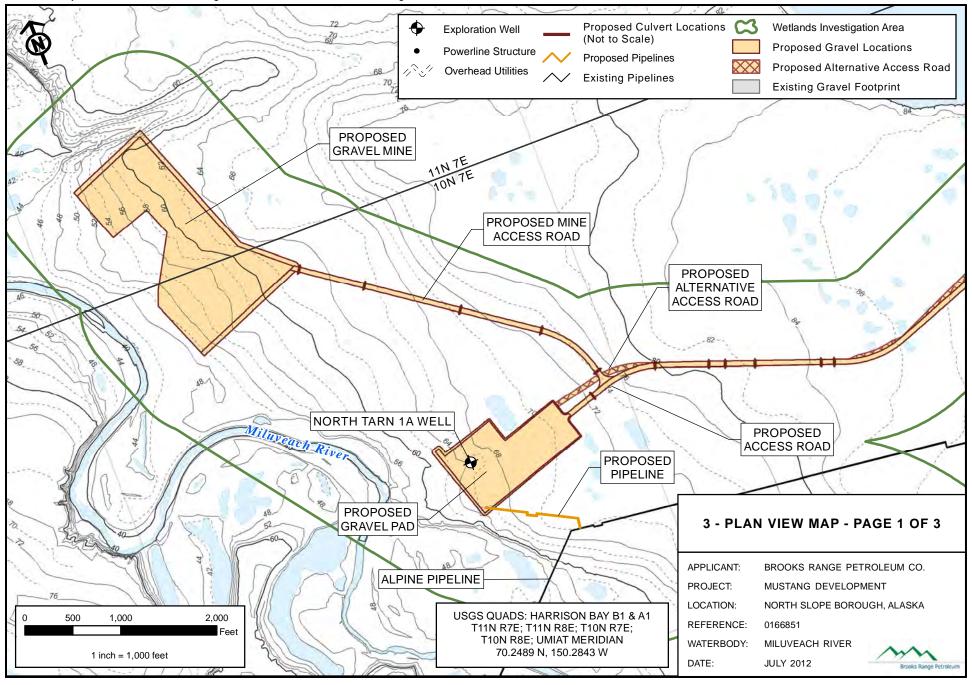
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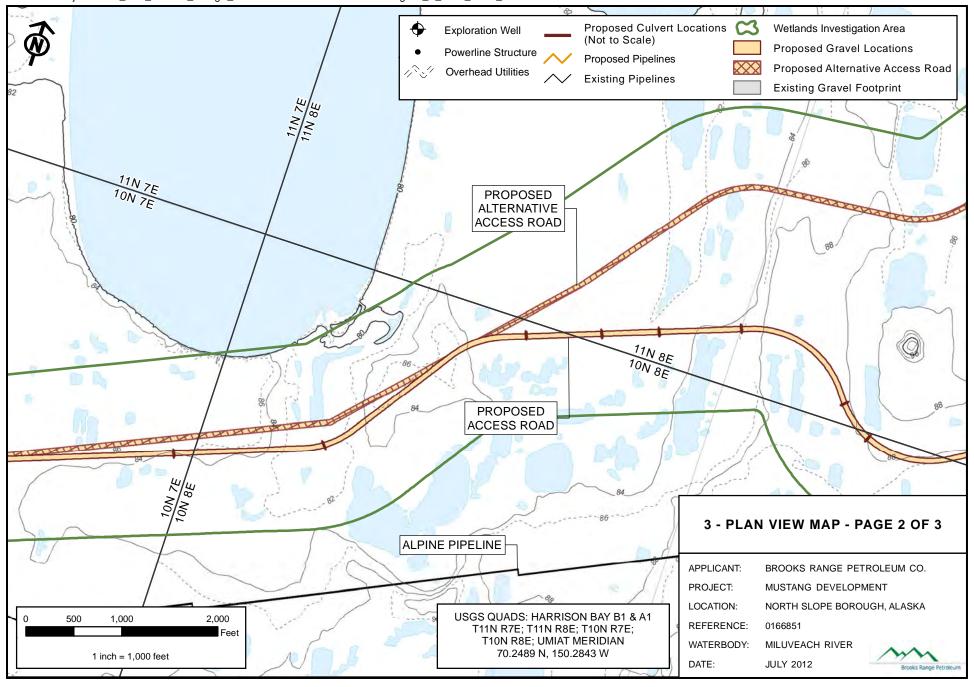


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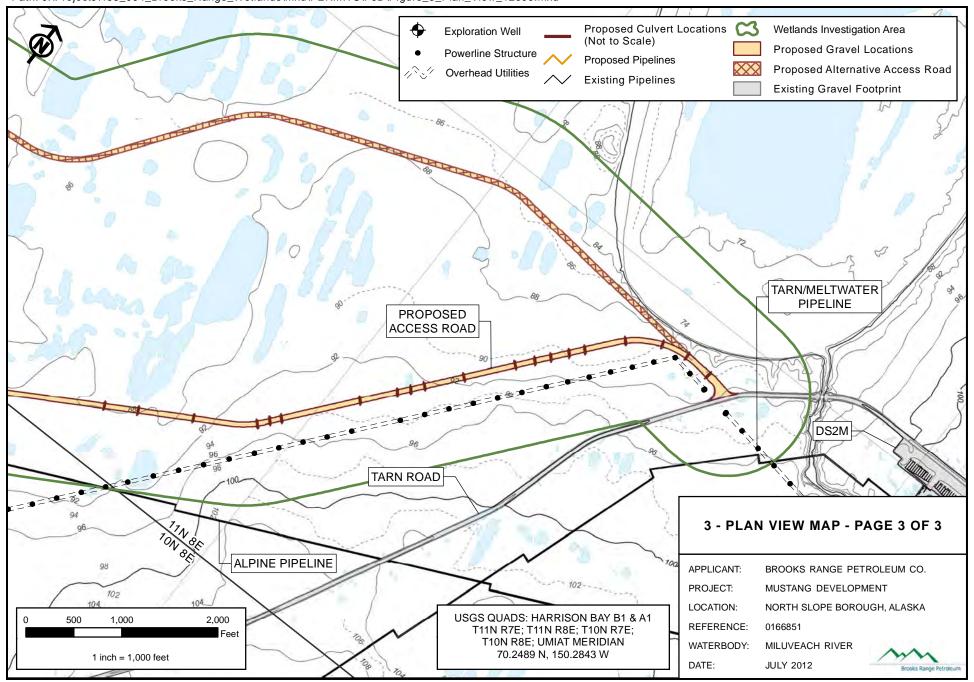


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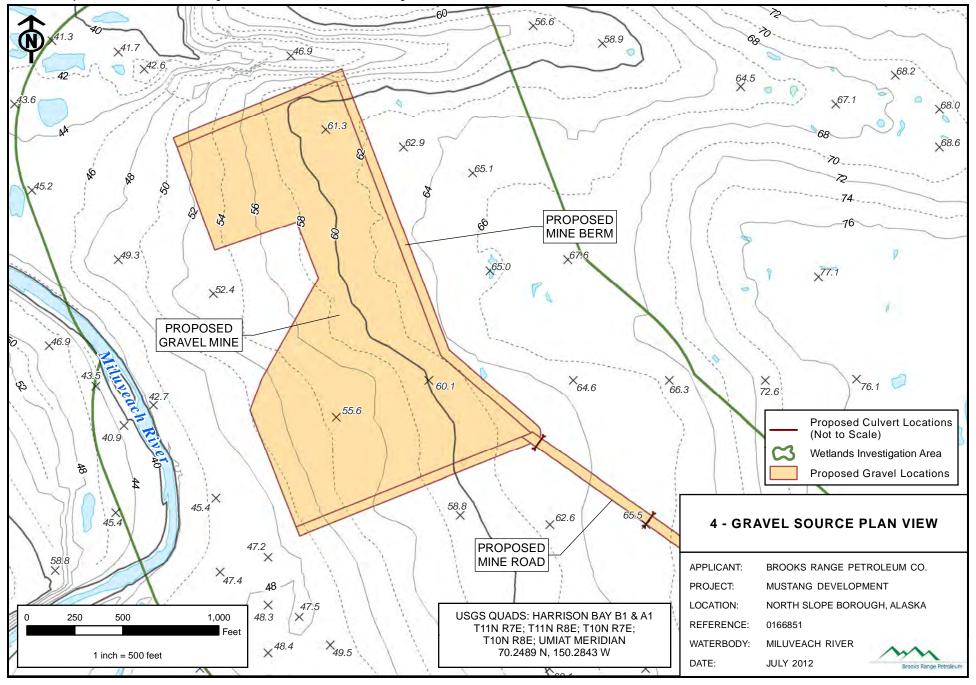




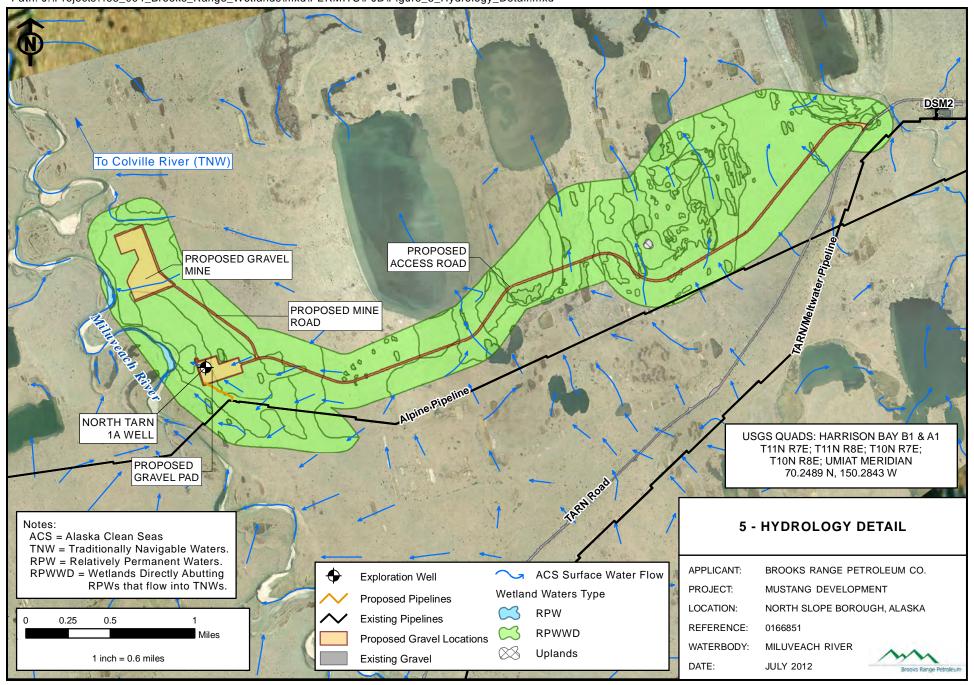
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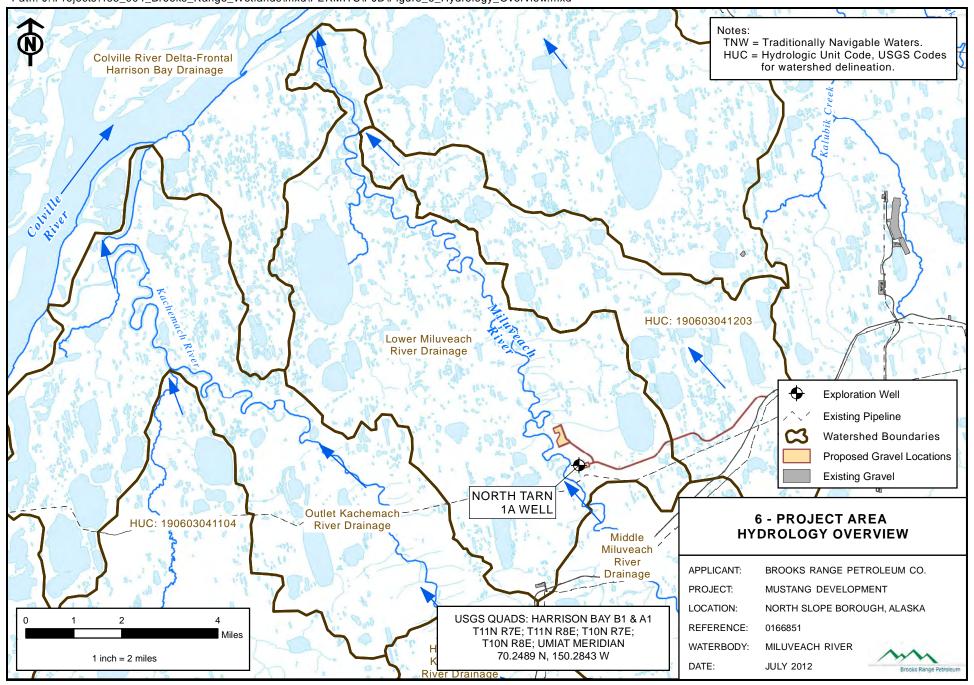
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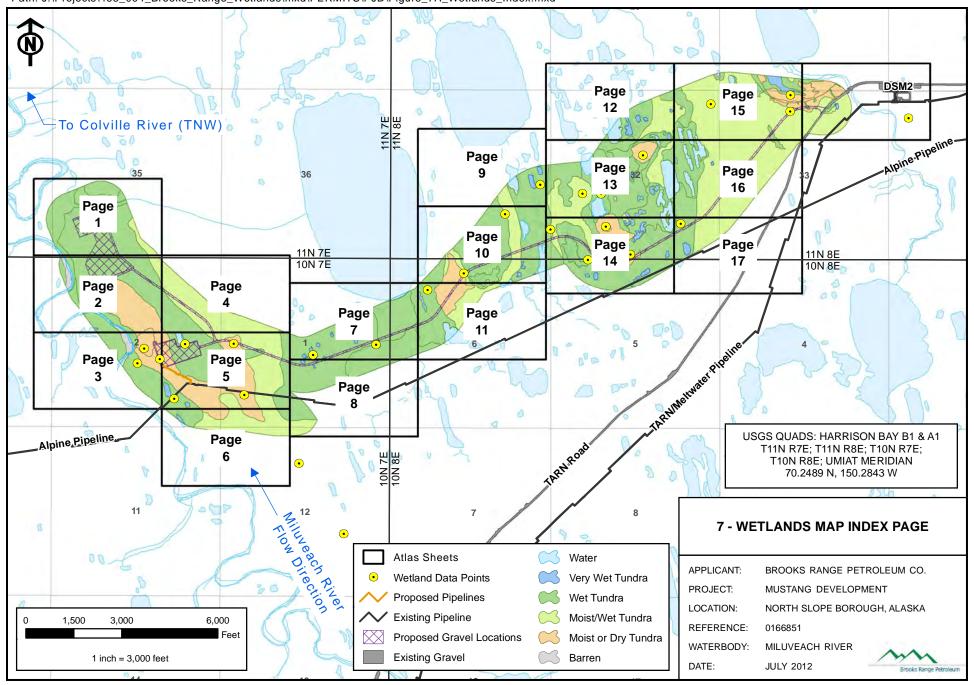
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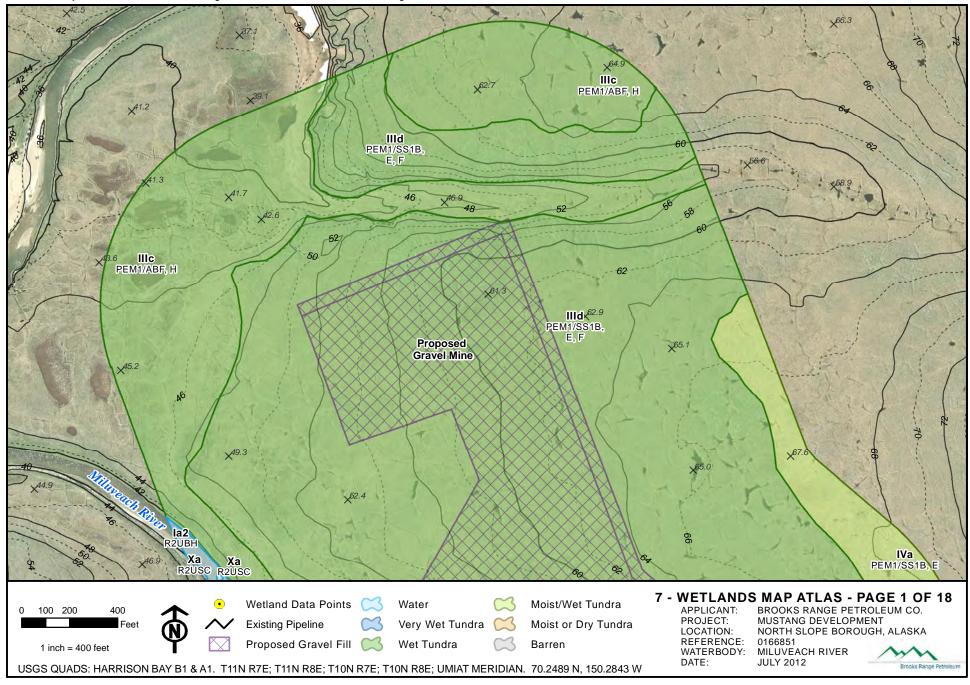
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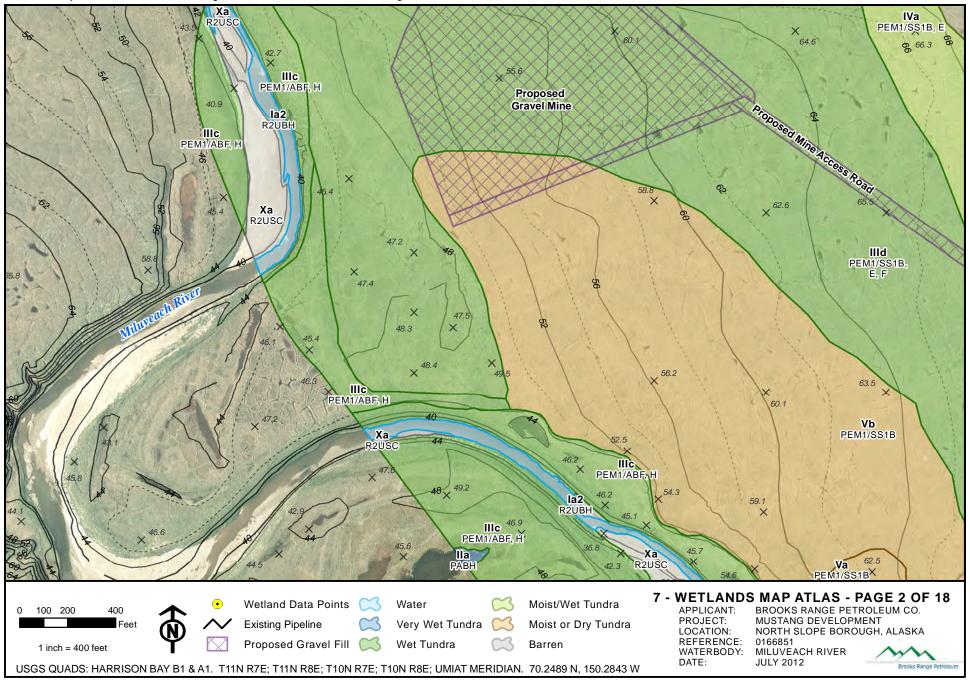
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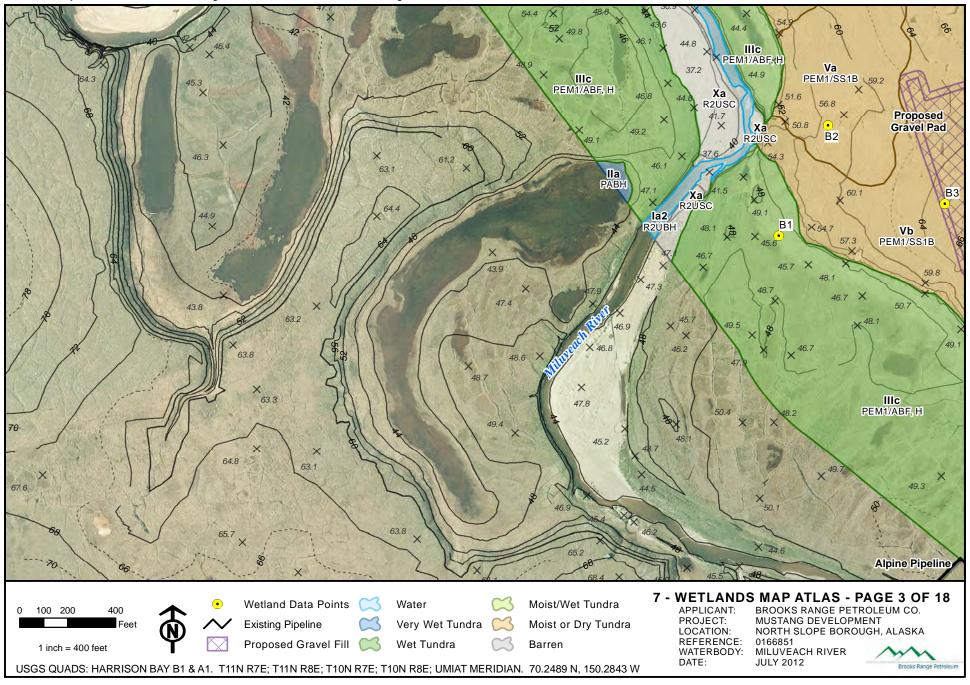
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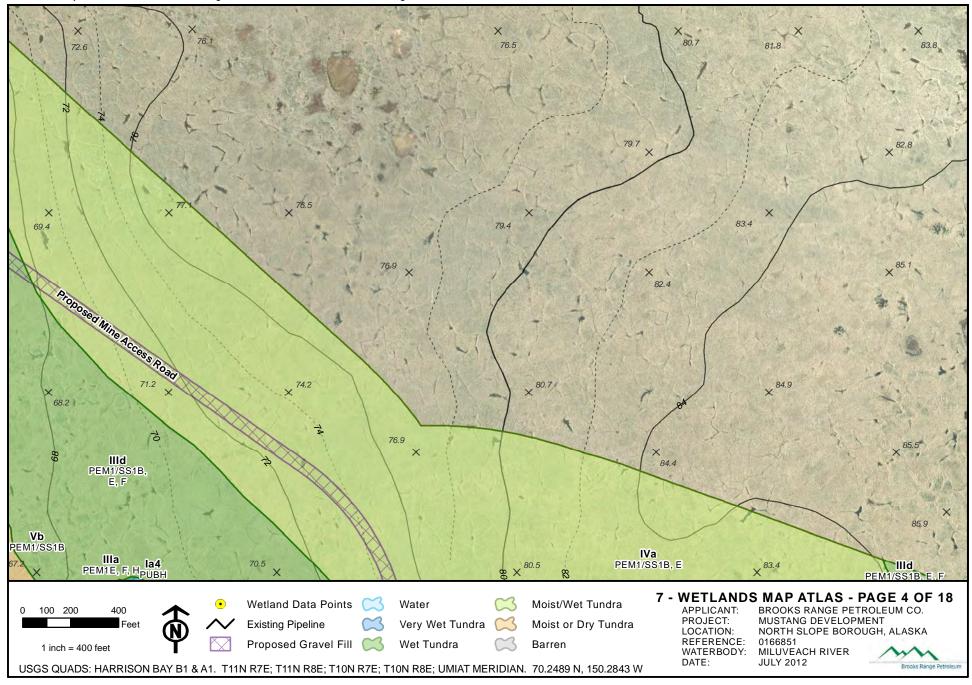
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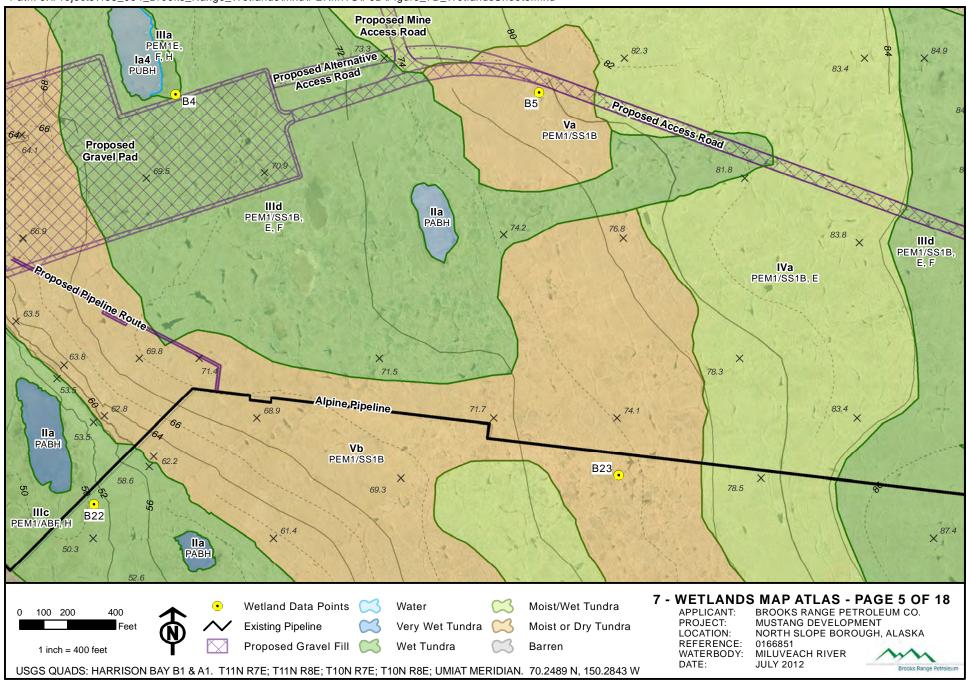
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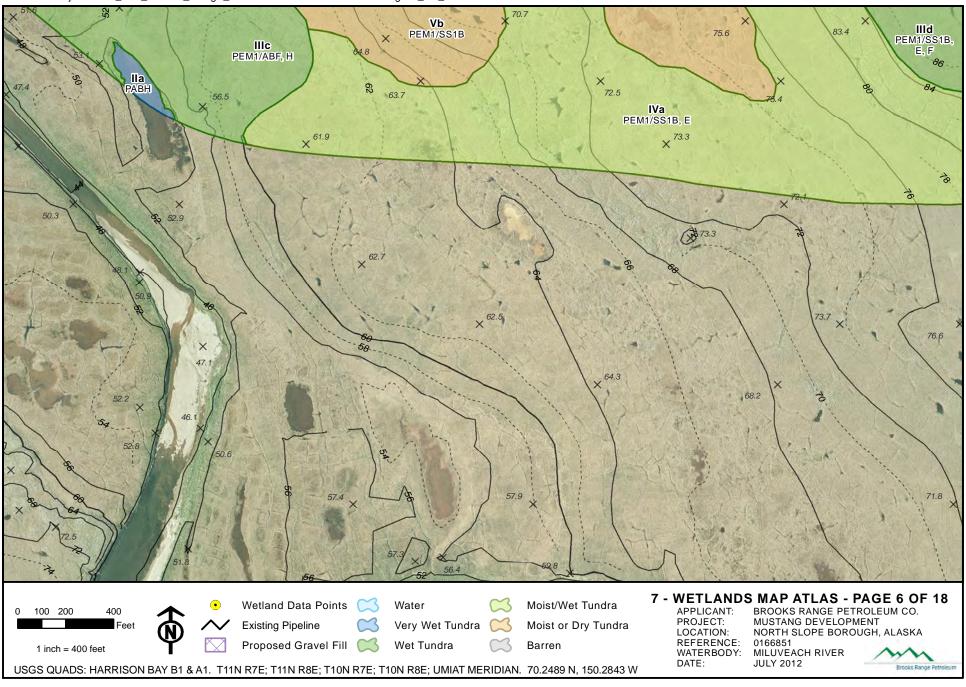
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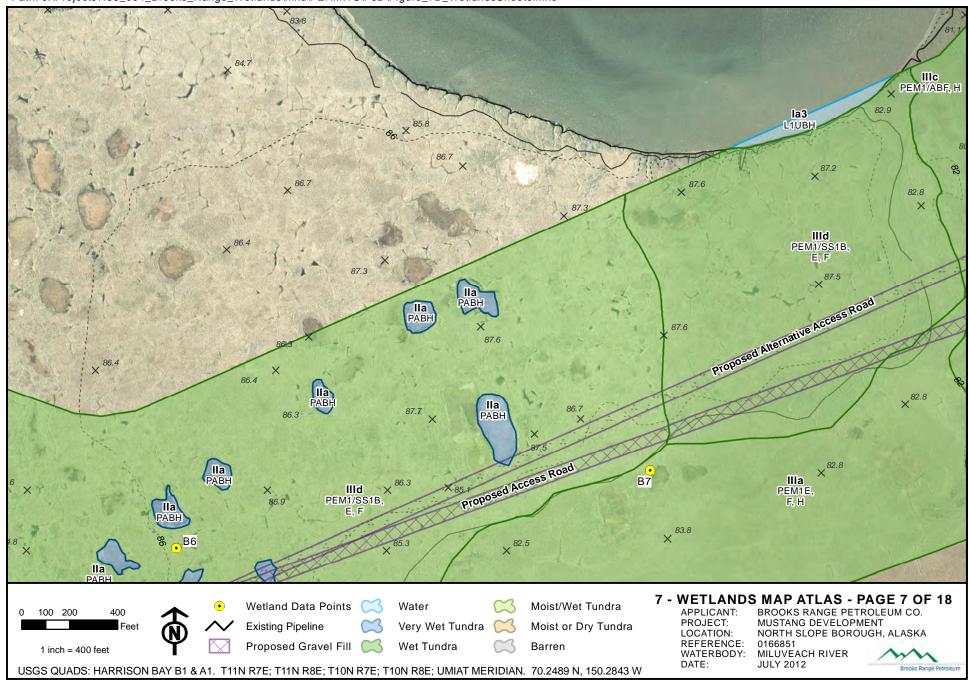
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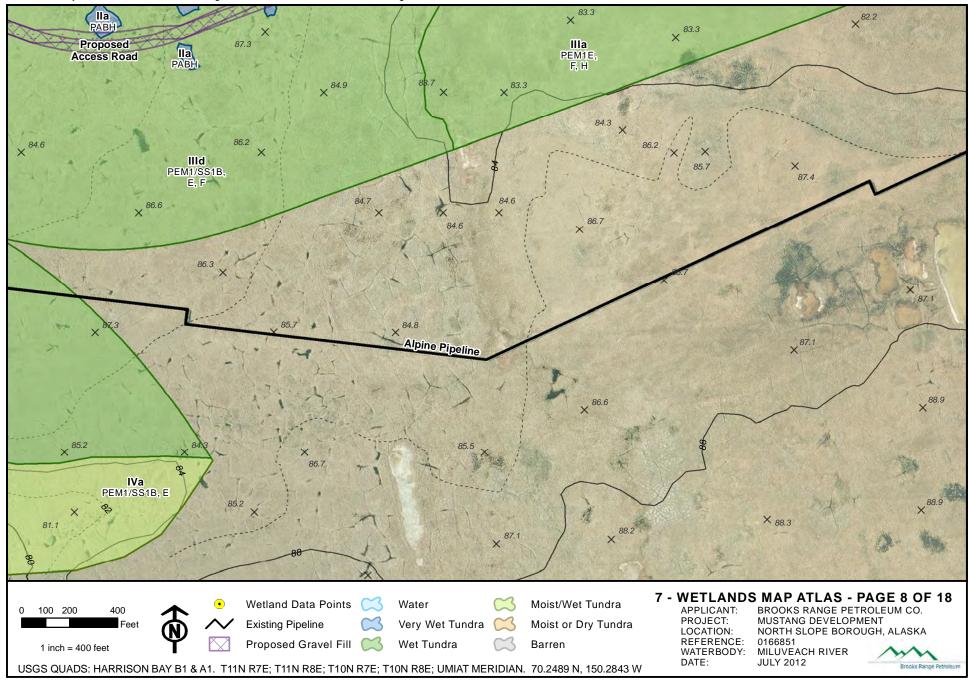
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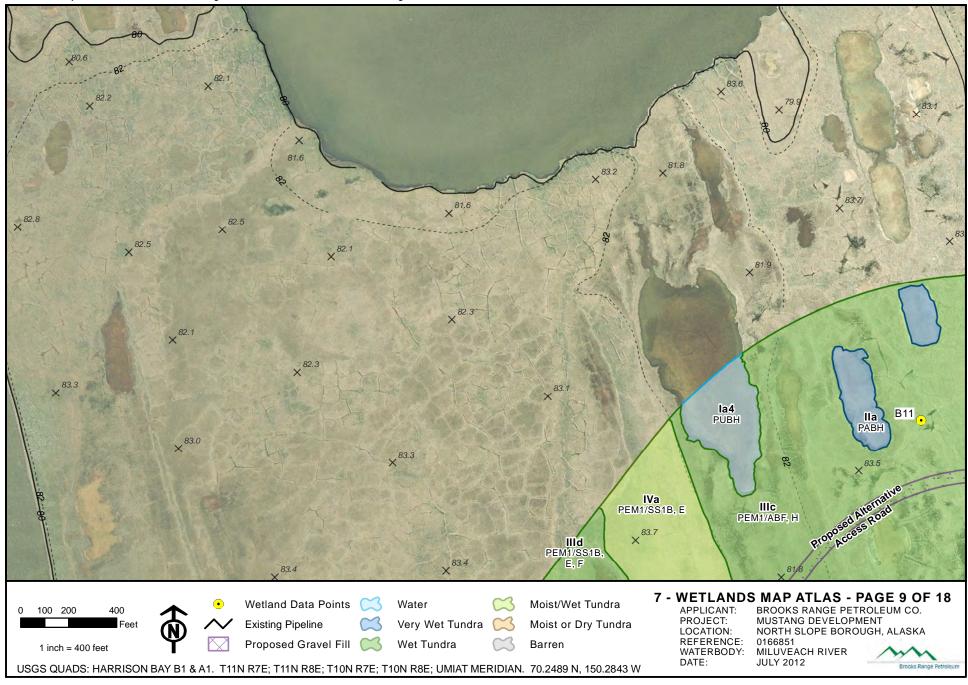
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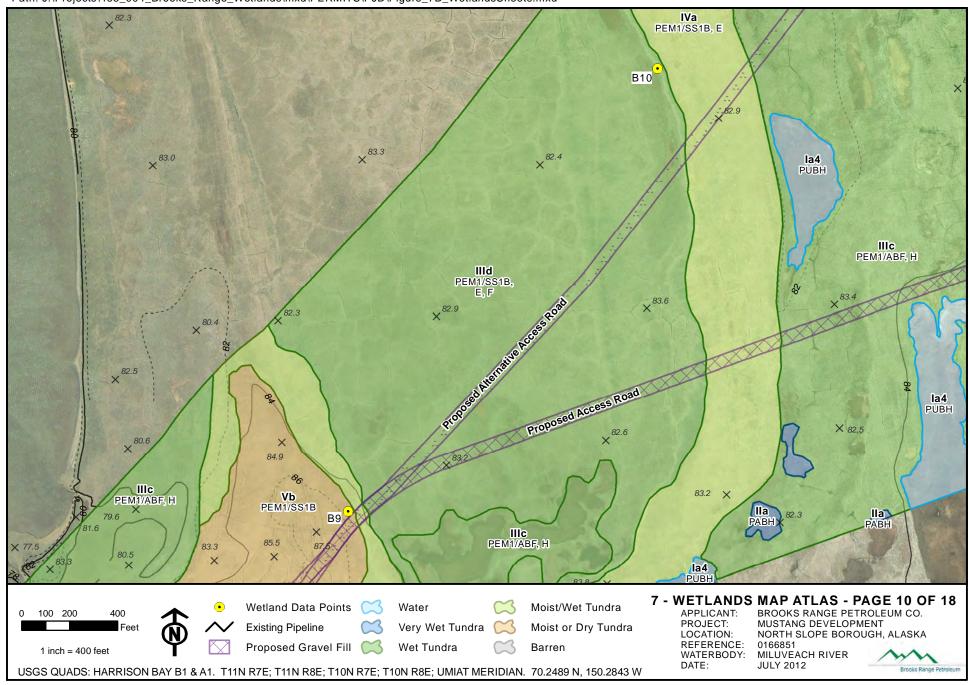
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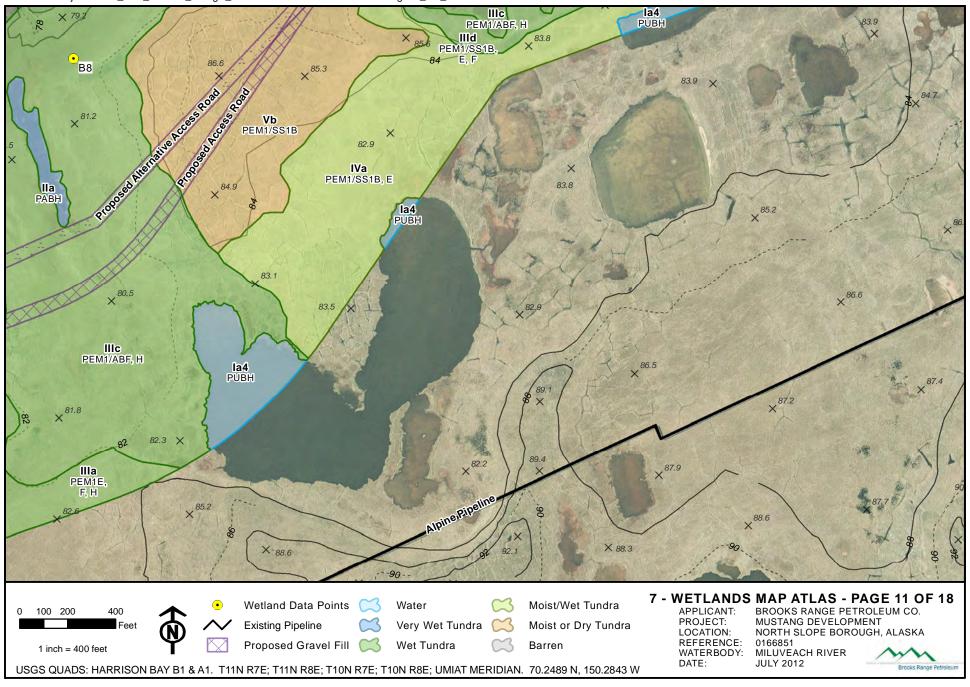
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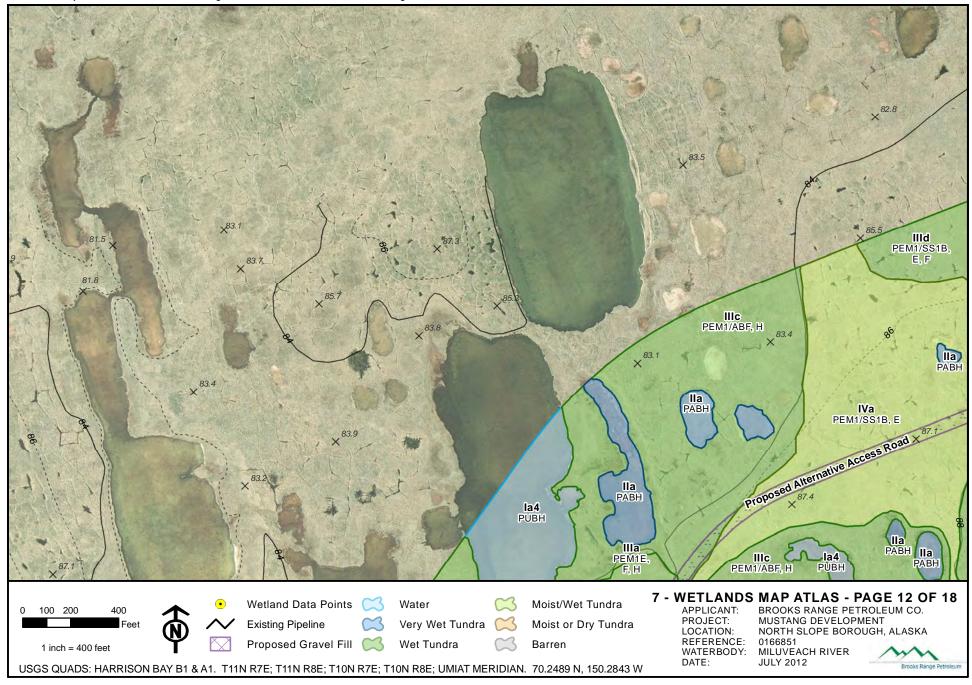
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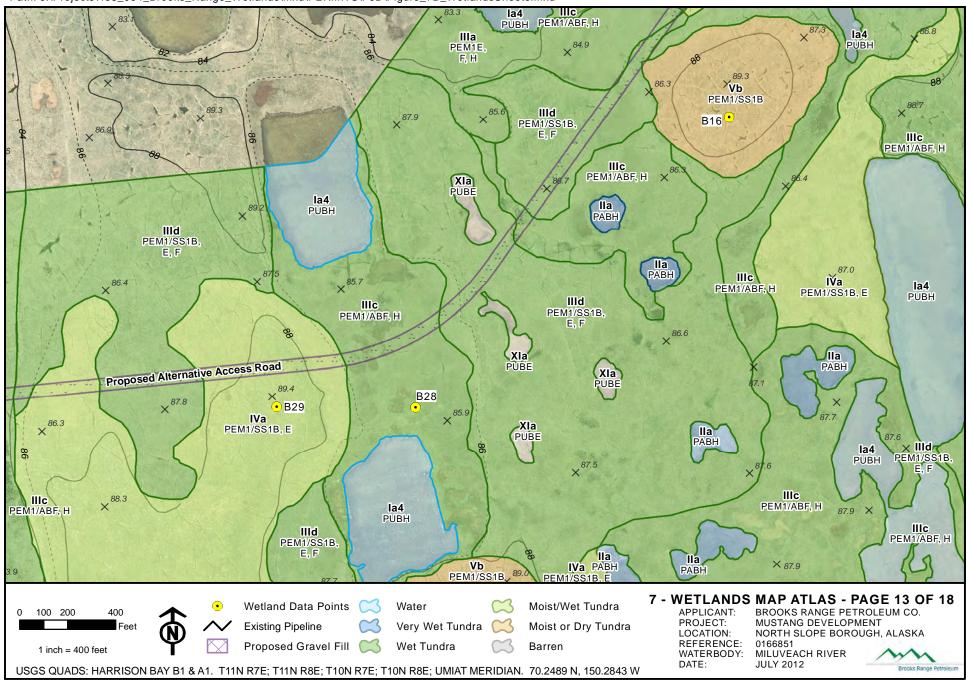
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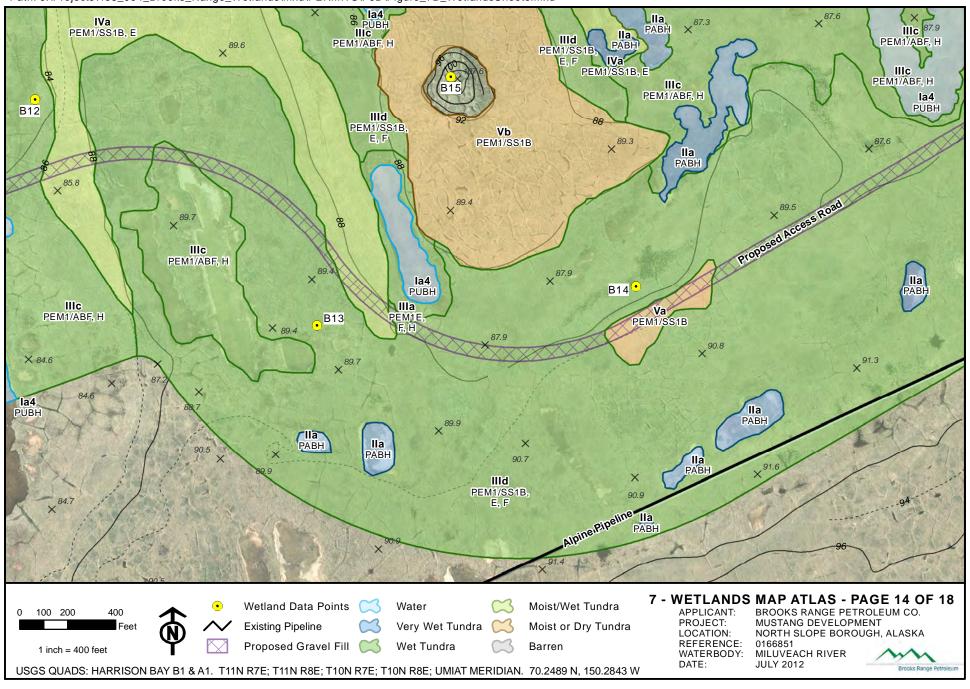
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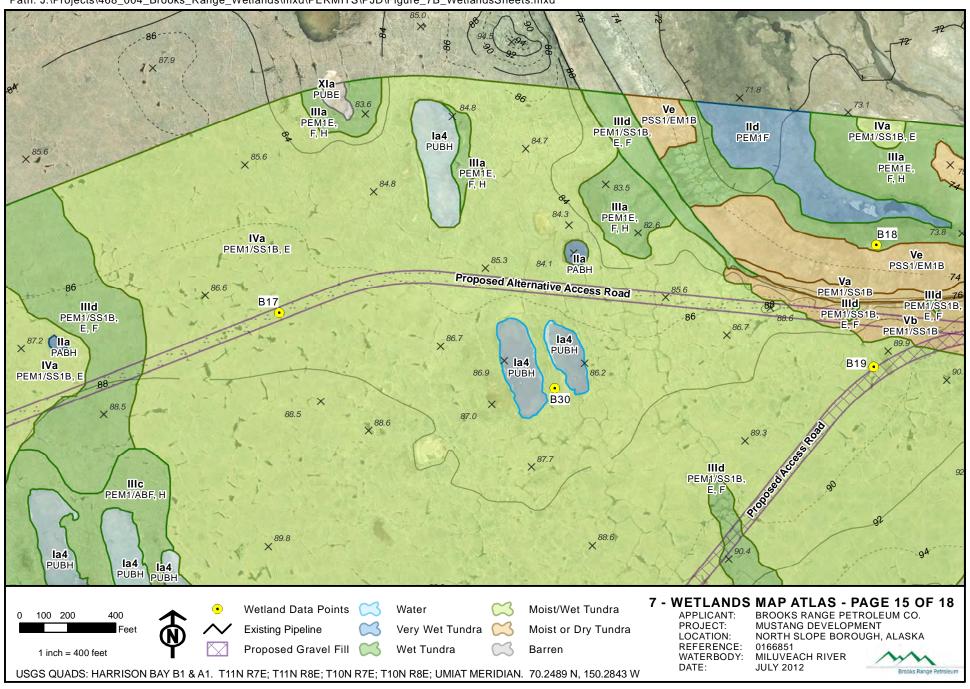
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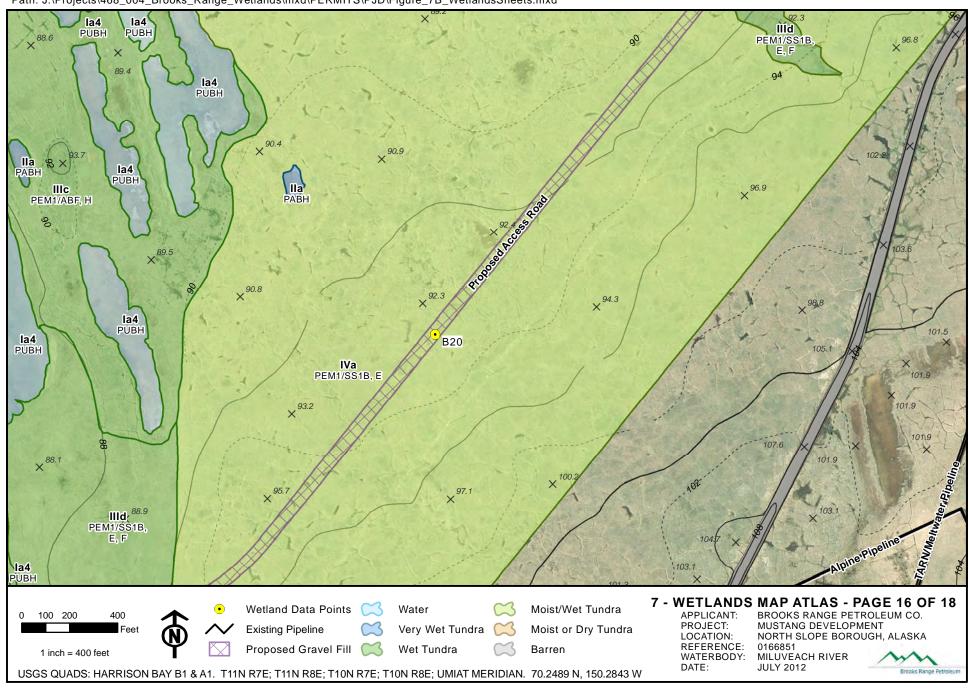
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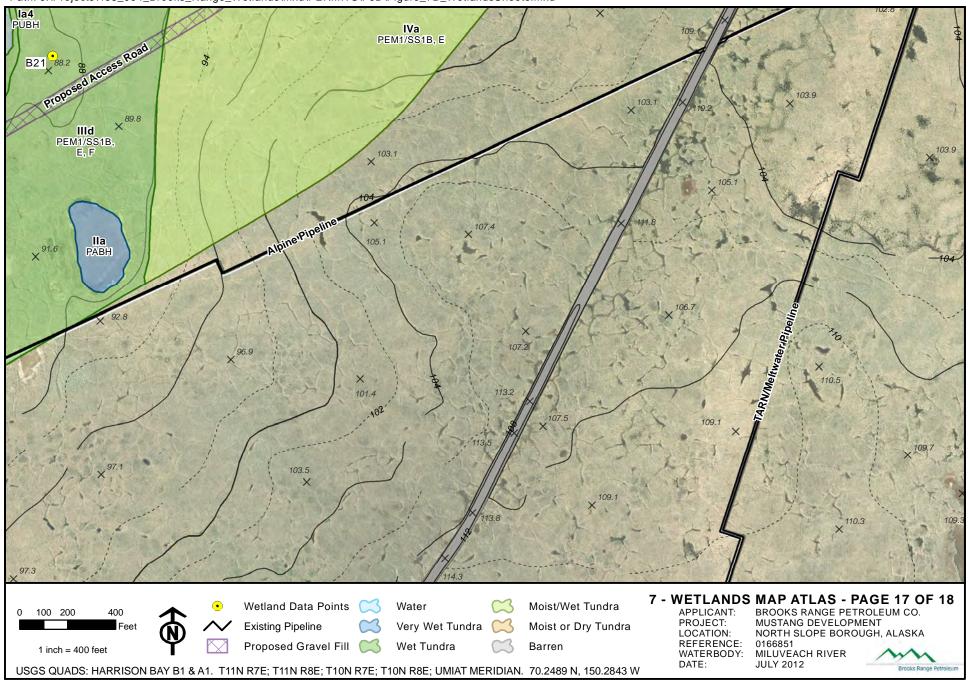
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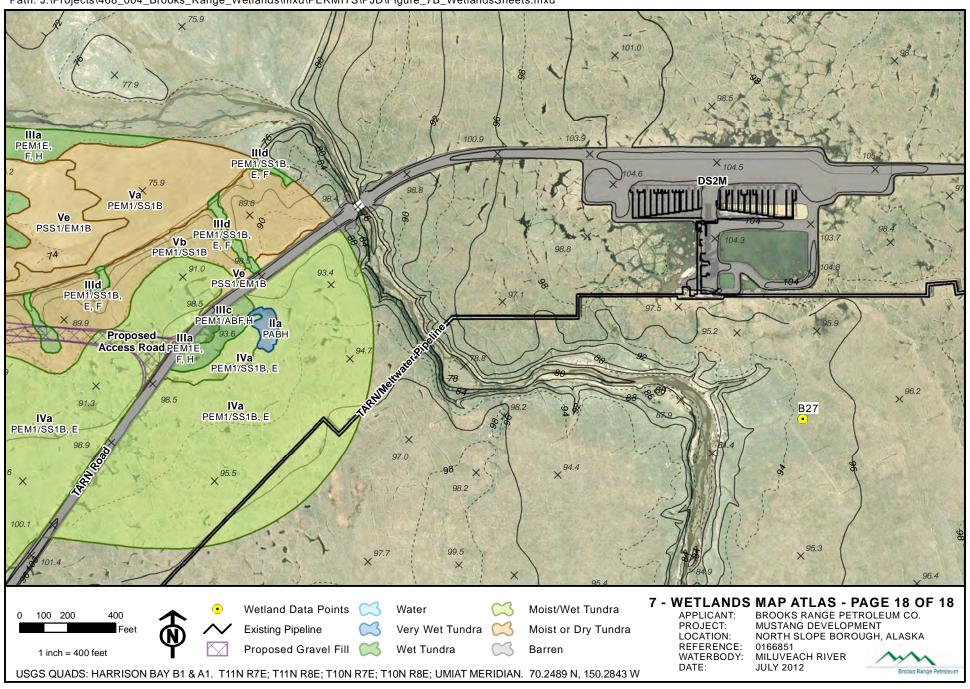
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APPENDIX C

Wetland Determination Datasheets



Project Site: Mustang Development	Project Borough/C	ty:North SI	ope			Sampling	Date	Aug 5,
Applicate/Owner: Brooks Range Petr	oleum					4777		
nvestigator(s): JBrekken, JO'Brien	L	andform (hills	side, terrace	, Huumock, e	te: Hummocks	Sampling	Point:	B-1
Local Relief (concave, convex, none):	Concave	Sic	pe (%): 2	-3				
Subregion:	Lat		Long	1	Datum:			
Are climate/hydrologic conditions on the	site typical for this tin	ne of year? Y	es					
Are Vegetation?,No Soil? No	or Hydrocabon	No	significant	y disturbed?	Are "Normal Circu	ımstances" Pre	sent?	Yes
Are Vegetation?, No Soil? No	or Hydrocabon	No	naturally p	roblematic?	(If needed, explain a	iny answers in Re	emarks)	
UMMARY OF FINDINGS - Attach site	map showing same	ling point is	ocations, tr	ansects, imp	ortant features, e	tc.		
Hydrophytic Vegetation Present?	Yes	Is the S	Sampled Are	а	.,			
lydric Soils Present?	Yes	within a	Wetland?	Yes				
Vetland Hydrology Present?	Yes							
Remarks: Located on floodplain terrace of	Miluveach River							
/EGETATION (List all species	In plot)							
	in pioty	Absolute	Dominant	200,000,000,000	Dominance Test	worksheet:		>
Tree Stratum (Use scientific names) 1.		%Cover	Species		Number of Domina			VAN
5					That Are OBL, FA		3	(A)
2.					Total Number of D Species Across Al	Called Attraction of the	4	(B)
3.					Percent of Domina	ent Species	_	- 3.7
4.					That Are OBL, FA		75	(A/B)
Sampling/Shrub Stratum	Total 50% of total cover:	Cover:	of total cover		Prevalence Ind			
Salix reticulata	50 % of total cover.	3	Yes	FAC	Total % Cover o			
2. Salix planifolia		2		FACW	OBL Species 30	77.1	126	_
					FACW Species 63 FAC Species 4	x2= x3=	12	-
3. Dryas integrifolium		10	Yes	LACO	FACU Species 10		40	
4.					UPL Species 0	x 5 =	0	
5.					Column Totals: 10	07 (A)	208	(B)
6.						- Ut - 122		
34 6-2-a		Cover: 15	and desirate management		Prevalence Index	= B/A = 1.94	_	
Herb Stratum	50% of total cover: 7	20%	of total cover.		Hydrophytic Veg	etation Indic	ators:	
1. Carex aquatilis		5		OBL	☑ Dominance			
2. Carex saxatilis		60	Yes	FACW	▼ Prevalence			
3. Eriophorum angustifolium		25	Yes	OBL	[선생] 하나 모모 보다되다.	al Adaptions' (F	rovide	
Pedicularis sudetica		1		FACW	supporting data in I			rate sheet)
5. Polygonum viviparum		1		FAC	Problematic	Hydrophytic Ve	egetation	n' Explain)
6					'Indicators of hydi			
w.					be present unless	disturbed or pi	roblemic	
Z.				-				
8.								
	Total 50% of total cover: 4	Cover: 92 5 20%	of total cover:	18.4	Hydrophytic Vegeta	ation Present?	L	'ne
Plot size (radius, or length x width) 15		are Ground:			nyarupnyac veget	audii F resent?	L	es
% Cover of Wetland Bryophytes:	Total	Cover of Bry	ophytes:	10				

-	-	
	_	n

_		-	
3	-		

0-4							Texture Remarks	Total Alexander
								Organics
4-17	10YR2/1	100					loamy sand	Organics/soil mix
Type: C	=Concentrations, D=	-Depletion	s. RM=Reduc	ed Matrix.	2Loc	ation: PL=P	ore Lininas. RC=Ro	ot Channel, M≃Matrix
Hydric Sc	oil indicators:		indic	ators for Pr	4.4	c Hydric Sol	3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3	
₩ Histo	sol or Histel (A1)		Г	Alaska Col	or Change	e (TA4)4		Alaska Gleyed Without Hue 5Y or
	Epipedon (A2)		Ė	Alaska Alpi				Redder Underlying Layer
	ogen Sulfide (A4)			Alaska Red				Other (Explain in Remarks)
2	Dark Surface (A12	Y -	,					
	ka Gleyed (A13)		3One	Indicator of	hydrophyt	ic vegetation	, one primary indica	tor of wetland hydrology,
	ka Redox (A14)						nust be present.	
	ka Gleyed Pores (A1	15)				e in Remarks		
	Layer (if present):					Car retire to		
T COST ION	Layer (ii present).	Frozen					Hydric Solis F	resent? Yes
Depth:	17" bgs						- 12	-
	OV							*****
	GY drology Indicators						Secondary	Indicators (2 or more required)
etland Hy			fficient)				A STATE OF THE STA	Indicators (2 or more required) tained Leaves (B9)
etland Hy rimary Indi	drology Indicators		207 (000)	Soil Cracks (E	36)		☐ Water S	167108 5 176 471
etland Hy rimary Indi Surfac	drology Indicators cators (any one Indi		Surface S	Soil Cracks (E	1 7 2 2 2 2 2 2	agery (B7)	Water S Drainag Salt De	tained Leaves (B9) ge Patterns (B10) posits (C5)
etland Hy rimary Indi Surfac High V	drology Indicators cators (any one Indic e Water (A1)		Surface S Inundation		Aerial Ima		Water S Drainag Salt De Oxidize	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C
etland Hy rimary Indi Surfac High V Satura	drology Indicators cators (any one Indice Water (A1) Vater Table (A2)		Surface S Inundation Sparsely	s Visible on	Aerial Ima oncave S		Water S Drainag Salt De Oxidize Presen	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cc ce of Reduced Iron (C4)
etland Hy rimary Indi Surface High V Satura Water Sedim	drology Indicators cators (any one indice water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2)		Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated Co Sulfide Odo on Water Tal	Aerial Ima oncave S r (C1) ble (C2)		Water S Drainag Salt De Oxidize Presen Stunted	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cice of Reduced Iron (C4) d or Stressed Plants (D1)
etland Hy rimary Indi Surface High V Satura Water Sedim	drology Indicators cators (any one indice water (A1) Vater Table (A2) tion (A3) Marks (B1)		Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated C Sulfide Odo	Aerial Ima oncave S r (C1) ble (C2)		Water S Drainag Salt De Oxidize Presen Stunted X Shallov	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cc ce of Reduced Iron (C4)
Surface High V Satura Water Sedim Drift D	drology Indicators cators (any one indice water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2)	cator is su	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated Co Sulfide Odo on Water Tal	Aerial Ima oncave S r (C1) ble (C2)		Water S Drainag Salt De Oxidize Presen Stunted X Shallov Geomo	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3)
Surface High V Satura Water Sedim Drift D Mat of	drology Indicators cators (any one indice e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3)	cator is su	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated Co Sulfide Odo on Water Tal	Aerial Ima oncave S r (C1) ble (C2)		Water S Drainag Salt De Oxidize Presen Stunted Shallow Geomo	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cice of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) uphic Position (D2)
Surface High V Satura Water Sedim Drift D Mat of	drology Indicators cators (any one indice e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Me eposits (B5)	cator is su	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated Co Sulfide Odo on Water Tal	Aerial Ima oncave S r (C1) ble (C2)		Water S Drainag Salt De Oxidize Presen Stunted Shallow Geomo	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) prophic Position (D2) pographic Relief (D4)
Surface High V Satura Water Sedim Drift D Mat of	drology Indicators cators (any one indice e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Me eposits (B5) vations:	cator is su	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated Co Sulfide Odo on Water Tal	Aerial Ima oncave S r (C1) ble (C2) parks)		Water S Drainag Salt De Oxidize Presen Stunted Shallow Geomo	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) prophic Position (D2) pographic Relief (D4)
Surface Surface Surface Satura Water Sedim Drift D Mat of Iron De	drology Indicators cators (any one indice e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Me eposits (B5) vations: r Present?	cator is su	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated Co Sulfide Odo on Water Tal oplain in Rem	Aerial Ima oncave S r (C1) ble (C2) narks)		Water S Drainag Salt De Oxidize Presen Stunted Shallow Geomo Microto FAC-N	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) prophic Position (D2) pographic Relief (D4)
Surface Water Table Furration Procledes cape	drology Indicators cators (any one indice e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5) vations: r Present? esent? esent? elilary fringe)	No Yes	Surface S Inundation Sparsely Hydroger Dry Seas Other (Ex	Depth (in	Aerial Ima oncave S r (C1) ble (C2) harks)	12 0	Water S Drainag Salt De Oxidize Presen Stunted Shallow Geomo	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) d or Stressed Plants (D1) or Aquitard (D3) urphic Position (D2) pographic Relief (D4) eutral Test (D5)
Surface Water Table Furration Procledes cape	drology Indicators cators (any one indice e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5) vations: r Present? esent?	No Yes	Surface S Inundation Sparsely Hydroger Dry Seas Other (Ex	Depth (in	Aerial Ima oncave S r (C1) ble (C2) harks)	12 0	Water S Drainag Salt De Oxidize Presen Stunted Shallow Geomo	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) d or Stressed Plants (D1) or Aquitard (D3) urphic Position (D2) pographic Relief (D4) eutral Test (D5)

Project Site: Mustang Development	Project Borough/Cit	y:North SI	ope			Sampling	Date	Aug 5, 2
Applicate/Owner: Brooks Range Petro	oleum	-						-
nvestigator(s): JBrekken, JO'Brien			side, terrace	, Huumock, e	tc: Hummocks	Sampling	Point:	B-2
ocal Relief (concave, convex, none):	Swale-like/concay	Sid	оре (%): 2					
Subregion:	Lat:		Long		Datum:			
are climate/hydrologic conditions on the	site typical for this time	e of year? Y	res .					
are Vegetation?,No Soil? No	or Hydrocabon?	No	significantly	disturbed?	Are "Normal Circu	mstances" Pre	esent?	Yes
Are Vegetation?, No Soil? No	or Hydrocabon?	No	naturally pr	oblematic?	(If needed, explain a	ny answers in Re	emarks)	
UMMARY OF FINDINGS - Attach site	map showing sampl	ing point is	ocations, tr	ansects, Imp	ortant features, e	tc.		
lydrophytic Vegetation Present?	Yes		Sampled Are					
lydric Soils Present?	Yes	within	a Wetland?	Yes				
Vetland Hydrology Present?	Yes							
Remarks: Swale-like landform with some m	noderately defined polygor	nal features.	Weakly define	d swale leading	towards the Miluvea	ch River		
/EGETATION (List all species	in plot)							
	in pioty	Absolute		W. C. L. C.	Dominance Test	worksheet		
Tree Stratum (Use scientific names) 1.		%Cover	Species		Number of Domina			in
					That Are OBL, FAC		-	(A)
2.					Total Number of D Species Across All		4	(B)
3.					Percent of Domina	nt Species		
4.					That Are OBL, FAC		75	(A/B)
Sampling/Shrub Stratum	Total C 50% of total cover:		of total cover		Prevalence Ind			
Salix reticulata	3070 Of total Cover.	3	Yes	FAC	Total % Cover o			
2. Salix planifolia		2		277.5	OBL Species 2 FACW Species 62	x1=	124	_
			Van		FAC Species 44		132	-
3. Dryas integrifolia		5	Yes	EAGO	FACU Species 5	×4=	20	_
4.					UPL Species 0	x 5 =	Ö	3.0
5.					Column Totals: 11	3 (A)	278	(B)
6.						212 24		
	Total C		of total cover:	-	Prevalence Index :	= B/A = 2.46	_	
Herb Stratum	JONE OF TOTAL COVER.	20%	or total cover.		Hydrophytic Veg	etation Indic	ators:	
Eriophorum vaginatum		10		EACW	□ Dominance □			
2. Carex saxatilis		50	Yes	FACW	▼ Prevalence T			
3. Eriophorum angustifolium		2		OBL	Morphologica	Adaptions' (F	Provide	
4. Carex bigelowii		40	Yes	EAC S	upporting data in F	Remarks or on	a spere	rate sheet)
5. Polygonum viviparum		1		EAC	Problematic	Hydrophytic Ve	egetation	n' Explain)
6.					Indicators of hydr			
7					be present unless	uisturbed or pi	opiemic	2
<u>.</u>					-			
8.	Tana da	mine 400						
Company of the same	Total C 50% of total cover: 51		of total cover:	20.6	lydrophytic Vegeta	tion Present?	V	'es
Plot size (radius, or length x width) 15	Tanadana .	are Ground:		7.7			I,	
% Cover of Wetland Bryophytes:	Total C	over of Bry	ophytes:	10				

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0	۲.	•	۰
		1	٠.

Type: C=C Hydric Soil Histoso Histic E Hydrog	oncentrations, Dindicators: I or Histel (A1) pipedon (A2)	100 =Depletions		ed Matrix.			114	loamy sand	Organics Organics/soil r	nix
Type: C=C Hydric Soil Histoso Histic E Hydrog	oncentrations, Di Indicators: I or Histel (A1)			ed Matrix.			0.113	loamy sand	Organics/soil r	nix
Hydric Soil Histoso Histic E Hydrog	Indicators: or Histel (A1)	=Depletions		ed Matrix.						
Histoso Histic E Hydrog	or Histel (A1)				2Loc	ation: F	L=Pore	Linings, RC=Ro	ot Channel, M=Ma	trix
Histic E Hydrog			Indic	ators for Pro	blematic	Hydric	: Sollsa:		1021	
Histic E Hydrog			г	Alaska Colo	r Change	e (TA4)4			Alaska Gleyed V	Vithout Hue 5Y or
Hydrog	PINCUUII (MC)		Ė	Alaska Alpir					Redder Underlyin	
	en Sulfide (A4)			Alaska Red					Other (Explain i	
	ark Surface (A12)								
Marin Marin	Gleyed (A13)	7.	зОпе	Indicator of h	ydrophyt	ic veget	ation, on	e primary indica	ator of wetland hyd	rology,
Alaska	Redox (A14)		and a	an appropriate	landsca	pe posit	ion must	be present.		
☐ Alaska	Gleyed Pores (A	15)	4Give	details of col	or chang	e in Rer	narks.			
Restrictive L	ayer (if present):	Frozen						Love 2 2 20	droug Thu	_
								Hydric Solis	Present? Yes	
Depth: 15	" bgs								-	
DROLOG etland Hydr	Y ology indicators							Secondary	Indicators (2 or mo	ore required)
imary Indicat	ors (any one indi	cator is suf	icient)				_	☐ Water S	Stained Leaves (B9)
Surface \	Vater (A1)	- [Surface S	Soil Cracks (B	6)			-	ge Patterns (B10)	
	er Table (A2)	Г		s Visible on A			A		eposits (C5)	- Uluina Danta (CO
Saturation	n (A3)	Г		Vegetated Co		urface (B8)	The second secon	ed Rhizospheres of nce of Reduced Iro	
	arks (B1)			Sulfide Odor	10.00				d or Stressed Plan	
	Deposits (B2)	Ī		on Water Tab					w Aquitard (D3)	
	osits (B3)	1.000	Other (E	plain in Rema	arks)				orphic Position (D2)
	rust of Algae or N	lari (B4)							opographic Relief (D4)
Iron Dep	osits (B5)							FAC-N	leutral Test (D5)	
eld Observa	tions:									
face Water P	resent?	No		Depth (in	ches):			13 -		
ter Table Pre	sent?	Yes		Depth (in	ches):	15		Wetland Hy	drology Present?	Yes
uration Presectudes capilla	ry fringe)	Yes		Depth (in		0				
escribe Reco	rded Data (stream	m gauge, m	onitoring we	l, aerial photo	s, previo	us inspe	ections),	if available:		

WETLAND DETERMINATION DATA FORM - Alaska Region

Applicate/Owner: Brooks Range Petr	oleum							1000
Investigator(s): JBrekken, JO'Brien		indform (hill	side, terrace	Huumock.	etc: Tussocks	Sampling	Point:	B-3
Local Relief (concave, convex, none):	Convex		ope (%): 2-		-	_		
Subregion:	Lat:		Long		Datum:			
Are climate/hydrologic conditions on the	e site typical for this tim	e of year?	res .	-				
Are Vegetation?, No Soil? No	or Hydrocabon?			disturbed?	Are "Normal Circ	umstances" Pre	sent?	Yes
Are Vegetation?,No Soil? No	or Hydrocabon?		naturally pr		(If needed, explain	entrance all and include		
SUMMARY OF FINDINGS - Attach sit			ocations to	nearte im	nortant foatures	ate		
Hydrophytic Vegetation Present?	Yes		Sampled Are		portant leatures, e	,		
Hydric Soils Present?	Yes		a Wetland?					
Wetland Hydrology Present?	Yes							
Remarks:								
	- C 3 - C - C							
/EGETATION (List all species	s in plot)	Absolute	Dominant	Indicator 1	Dominance Test	workshoot		
Tree Stratum (Use scientific names)		%Cover	2.5111111111111111111111111111111111111	Status	Number of Domin			
1.					That Are OBL, FA		1	(A)
2.					Total Number of I			and the same of th
3.					Species Across A	II Strata:	2	(B)
4.					Percent of Domini That Are OBL, FA		50	(A/B)
Sampling/Shrub Stratum	Total (of total cover:		Prevalence Inc	dex:		
Salix reticulata	50% of total cover.	2	or total cover.	FAC		of: Multiplied by		
4 4		2		FAC	OBL Species 0		70	_
			66.00	15.51	FACW Species 3	x2 = x3 =	42	-
3. Dryas integrifolium		10	Yes	FACU		3 x4=	52	_
Cassiope tetragona		3		FACU	UPL Species 0	x 5 =	0	=
5.					Column Totals: 6	2 (A)	129	(B)
6.					2			
Salara Salara		Cover: 17		2.4	Prevalence Index	= B/A = 2.65		
Herb Stratum	50% of total cover: 8.	5 20%	or total cover.	3.4	Hydrophytic Ve	netation indic	ators:	
Polygonum bistorta		5		FAC		Test is >50%	41010.	
2. Saussurea angustifolia		5		FAC	▼ Prevalence			
3. Eriophorum vaginatum		35	Yes	FACW		al Adaptions' (F	rovide	
Calamagrostis purpurascens		35	Yes	NI	supporting data in			rate sheet)
5.			7-12		Problematic	Hydrophytic Ve	getation	n' Explain)
					'Indicators of hyd			
6.					be present unless	disturbed or pr	oblemic	2
Z.								
8.								
	Total 0		of total cover:	16	Hudranhydia Vasst	ation Procest?	T.	
Plot size (radius, or length x width) 1	FI Five	are Ground		10	Hydrophytic Veget	audii Fiesent?	l,	'es
% Cover of Wetland Bryophytes:	Total (Cover of Bry	ophytes:	20				

Remarks: Micro-topography in form of hummocks/tussocks with Cassiope and Dryas species occupying the higher/drier areas and gramminoids in lower/wetter areas.

SOIL

Sampling Point:

B-3

0-2 2-8 7.5 YR 2.5/1 100 loarn Organics 8-12 7.5 YR 3/2 90 5 YR 5/8 10 RM d clay loarn Organics/soil mix 12-16 10 YR 2/1 100 loarny sand 12-16 10 YR 2/1 100 loarny sand 17ype: C=Concentrations, D=Depletions, RM=Reduced Matrix. a.t.ocation: PL=Pore Linings, RC=Root Channel, M=Matrix Hydric Soil Indicators: Indicator for Problematic Hydric Soils: Histosol or Histel (A1) Alaska Color Change (TA4)4 Alaska Gleyed Without Hue SY or Redder Underlying Layer Hydrogen Sulfide (A4) Alaska Redox With 2.5Y Hue Other (Explain in Remarks) Hydrogen Sulfide (A4) Alaska Redox With 2.5Y Hue Other (Explain in Remarks) Alaska Gleyed Pores (A15) Alas	0-2 2-8 7.5 YR 2.5/1 100 loam CO 8-12 7.5 YR 3/2 90 5 YR 5/8 10 RM day loam CO 12-16 10 YR 2/1 100 loamy sand 17ype: C=Concentrations, D=Depletions, RM=Reduced Matrix. 2Location: PL=Pore Linings, RC=Root Ch Hydric Soil Indicators: Indicators for Problematic Hydric Soilss: Histosol or Histel (A1)	Remarks
2-8 7.5 YR 2.5/1 100 loam Organics/soil mix 8-12 7.5 YR 3/2 90 5 YR 5/8 10 RM M day loam Organics/soil mix 12-16 10 YR 2/1 100 loamy sand 17ype: C=Concentrations, D=Depletions, RM=Reduced Matrix. aLocation: PL=Pore Linings, RC=Root Channel, M=Matrix Hydric Soil Indicators: Indicator for Problematic Hydric Soils: Histosol or Histel (A1)	2-8 7.5 YR 2.5/1 100 loam CO 8-12 7.5 YR 3/2 90 5 YR 5/8 10 RM M clay loam CO 12-16 10 YR 2/1 100 loamy sand 1Type: C=Concentrations, D=Depletions, RM=Reduced Matrix. 2Location: PL=Pore Linings, RC=Root Ch Hydric Soil Indicators: Indicators for Problematic Hydric Soilss: Histosol or Histel (A1)	
8-12 7.5 YR 3/2 90 5 YR 5/8 10 RM M clay loam Organics/soll mix 12-16 10 YR 2/1 100 loamy sand 17ype: C=Concentrations, D=Depletions, RM=Reduced Matrix. st.ocation: PL=Pore Linings, RC=Root Channel, M=Matrix Hydric Soil Indicators: Indicators for Problematic Hydric Soilss: Histosol or Histel (A1)	8-12 7.5 YR 3/2 90 5 YR 5/8 10 RM day loam Co 12-16 10 YR 2/1 100 loamy sand 17ype: C=Concentrations, D=Depletions, RM=Reduced Matrix. 2Location: PL=Pore Linings, RC=Root Ch Hydric Soll Indicators: Indicators for Problematic Hydric Solls:: Histosol or Histel (A1)	
12-16 10 YR 2/1 100 loamy sand 1Type: C=Concentrations, D=Depletions, RM=Reduced Matrix. aLocation: PL=Pore Linings, RC=Root Channel, M=Matrix Hydric Soil Indicators: Indicators for Problematic Hydric Soils: Histosol or Histel (A1)	12-16 10 YR 2/1 100 loamy sand 1Type: C=Concentrations, D=Depletions, RM=Reduced Matrix.	
### Type: C=Concentrations, D=Depletions, RM=Reduced Matrix. aLocation: PL=Pore Linings, RC=Root Channel, M=Matrix #### Histosol or Histel (A1)	Indicators for Problematic Hydric Sollsa: Histosol or Histel (A1)	rganics/soil mix
Hydric Soli Indicators: Histosol or Histel (A1)	Hydric Soil Indicators: Histosol or Histel (A1)	
Histosol or Histel (A1) Alaska Color Change (TA4)4 Alaska Gleyed Without Hue 5Y or Redder Underlying Layer Alaska Alpine Swales (TA5) Thick Dark Surface (A12) Alaska Gleyed (A13) Alaska Gleyed (A13) Alaska Gleyed (A13) Alaska Gleyed (A13) Alaska Redox With 2.5Y Hue Thick Dark Surface (A12) Alaska Gleyed (A13) Alaska Redox (A14) Alaska Gleyed (A13) Alaska Redox (A14) Alaska Gleyed (A15) Alaska Gleyed (A15) Restrictive Layer (if present): Frozen Depth: 16° bgs Hydric Soils Present? Prozen Beararks: **Secondary Indicators (2 or more required) Water Stained Leaves (B9) Drainage Patterns (B10) Sail Deposts (C3) Fresence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Sediment Deposits (B2) Dry Season Water Table (C2) Drift Deposits (B3) Mat of Crust of Algae or Marl (B4) Iron Deposits (B3) Mo Depth (inches): Irace Water Present? Ves Depth (inches): Jeepth (inches	Histosol or Histel (A1)	annel, M=Matrix
Histic Epipedon (A2)	Histic Epipedon (A2)	
Alaska Alpine Swales (TA5) Redder Underlying Layer	Histic Epipedon (A2)	ka Gleyed Without Hue 5Y or
Hydrogen Sulfide (A4) Thick Dark Surface (A12) Alaska Gleyed (A13) Alaska Gleyed (A13) Alaska Gleyed (A14) Alaska Gleyed Pores (A15) Alaska Gleyed (A14) Alaska Gleyed Pores (A15) Alaska Gleyed (A13) Alaska Gleyed (A14) Alaska Gleyed (A13) Alaska Gleyed (A14) Alaska Gleyed (A14) Alaska Gleyed (A13) Alaska Gleyed (A14) Alaska Cleyed (A14) Alaska Cley (A14) Alaska Cleyed (A14) Alaska Cleyed (A14) Alaska Cleyed (Hydrogen Sulfide (A4) Thick Dark Surface (A12) Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15) Restrictive Layer (if present): Prozen Depth: 16" bgs Prozen Hydric Solls Prese Hydric Solls Prese Prozen Water Stainer Drainage Pa High Water Table (A2) High Water Table (A2) Finandations Visible on Aerial Imagery (B7) Saturation (A3) Sparsely Vegetated Concave Surface (B8) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry Season Water Table (C2) Drift Deposits (B3) Other (Explain in Remarks) Geomorphic Microtopogon FAC-Neutral	일시[생시] 교육 [1] 보이 되었다면 하다.
Thick Dark Surface (A12) Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15) Restrictive Layer (if present): Frozen Depth: 16" bgs Alaska Gleyed Pores (A15) By Urface Soil Cracks (B6) High Water Table (A2) Finundations Visible on Aerial Imagery (B7) Saturation (A3) Sparsely Vegetaded Concave Surface (B8) Water Marks (B1) Forment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Mo Depth (inches): Inded Observations: Inface Water Present? Mo Depth (inches): De	Thick Dark Surface (A12) Alaska Gleyed (A13) Alaska Redox (A14) Alaska Gleyed Pores (A15) Restrictive Layer (if present): Frozen Depth: 16" bgs Prozen Hydric Soils Proze Hydric Soils Proze Hydric Soils Proze Becondary Indicators (and Indicators	
Alaska Redox (A14) and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) 4Give details of color change in Remarks. Restrictive Layer (if present): Frozen	Alaska Redox (A14) Alaska Gleyed Pores (A15) Restrictive Layer (if present): Depth: 16" bgs Alaska Gleyed Pores (A15) Frozen Depth: 16" bgs Alaska Gleyed Pores (A15) Frozen Depth: 16" bgs Hydric Soils Prese Hydric Soils Prese Water Stainer Water Stainer Surface Water (A1) Fully Water Table (A2) Finand Hydrogen Sulfide Odor (C1) Formula Gleyed Pores (A1) Formula Gleyed Pores (A1) Formula Hydrology Indicators: Frozen Water Stainer Formula Gleyed Pores (A1) Formula Hydrology in Remarks: Depth: 16" bgs Water Stainer Water Stainer Formula Gleyed Pores (A1) Formula Gleyed Pores (A15) Formu	X 11/2
Alaska Gleyed Pores (A15) Restrictive Layer (if present): Frozen Depth: 16" bgs PROLOGY Vetland Hydrology Indicators: Irrimary Indicators (any one indicator is sufficient). High Water Table (A2) Water Marks (B1) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Marf (B4) Iron Deposits (B5) Iron Deposits (B5) Alaska Gleyed Pores (A15) Agive details of color change in Remarks. Hydric Soils Present? Water Stained Leaves (20 or more required) Water Stained Leaves (89) Drainage Patterns (B10) Salt Deposits (C5) Oxidized Rhizospheres on Living Roots (C3 Presence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Solimon Deposits (B3) Other (Explain in Remarks) Depth (inches): Inches (Depth (inches): Inc	Alaska Gleyed Pores (A15) Restrictive Layer (if present): Frozen Depth: 16" bgs Hydric Solls Prese Benarks: Prozen Depth: 16" bgs Hydric Solls Prese Hydric Solls Prese Hydric Solls Prese Becondary Indicators (any one indicator is sufficient) Surface Water (A1) Surface Soil Cracks (B6) High Water Table (A2) Inundations Visible on Aerial Imagery (B7) Salt Deposits Saturation (A3) Sparsely Vegetated Concave Surface (B8) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Drift Deposits (B3) Other (Explain in Remarks) Geomorphic Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) FAC-Neutral	wetland hydrology,
Restrictive Layer (if present): Frozen Depth: 16" bgs Prozen	Restrictive Layer (if present): Frozen Depth: 16" bgs Proposition of Crust of Algae or Marl (B4) Depth: 16" bgs Hydric Soils Prese Secondary Indicators (any one indicator is sufficient) Water Stainer Drainage Pa Salt Deposits Salt Deposits Oxidized Rhi Presence of Stunted or S Stunted or S Shallow Aqu Geomorphic Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) FAC-Neutral	
Depth: 16" bgs PYDROLOGY Vetland Hydrology Indicators: Primary Indicators (any one indicator is sufficient) Surface Water (A1) High Water Table (A2) Saturation (A3) Saturation (A3) Sparsely Vegetated Concave Surface (B8) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Field Observations: rface Water Present? No Depth (inches): Depth (Process Pro	
Depth: 16" bgs Hydric Soils Present? Yes	Depth: 16" bgs Hydric Soils Prese	
PYDROLOGY Wetland Hydrology Indicators: Primary Indicators (any one indicator is sufficient) Surface Water (A1) Surface Soil Cracks (B6) Surface Water (A2) Inundations Visible on Aerial Imagery (B7) Saturation (A3) Sparsely Vegetated Concave Surface (B8) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Drift Deposits (B3) Other (Explain in Remarks) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) No Depth (inches): ater Table Present? Yes Depth (inches): 10 Secondary Indicators (2 or more required) Water Stained Leaves (B9) Drainage Patterns (B10) Drainage Patterns (Primary Indicators (any one indicator is sufficient) Surface Water (A1) High Water Table (A2) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Marl (B4) Wetland Hydrology Indicators: Secondary Indicators Water Stained Water Stained Formany Indicators (any one indicator is sufficient) Inundations Visible on Aerial Imagery (B7) Salt Deposits Oxidized Rhi Presence of Stunted or S Stunted or S Shallow Aqu Other (Explain in Remarks) Microtopogra FAC-Neutral	nt? Yes
YDROLOGY Wetland Hydrology Indicators: Primary Indicators (any one indicator is sufficient) Surface Water (A1) High Water Table (A2) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Field Observations: Irrace Water Table (Passed) Wetland Hydrology Present? Yes Depth (inches): Descondary Indicators (2 or more required) Water Stained Leaves (B9) Drainage Patterns (B10) Salt Deposits (C5) Oxidized Rhizospheres on Living Roots (C3) Presence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Shallow Aquitard (D3) Geomorphic Position (D2) Microtopographic Relief (D4) FAC-Neutral Test (D5) Wetland Hydrology Present? Yes Wetland Hydrology Present? Yes	YDROLOGY Vetland Hydrology Indicators: Secondary Indicators Water Stainer Surface Water (A1) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Water Marks (B1) Secondary Indicators Water Stainer Salt Deposits Salt Deposits Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Drift Deposits (B3) Other (Explain in Remarks) Mat of Crust of Algae or Marl (B4) I Secondary Indicators Secondary Indicators Secondary Indicators Secondary Indicators Secondary Indicators Pater Stainer Dry Salt Deposits Oxidized Rh Presence of Stunted or S Stunted or S Water Table (C2) Water Marks Secondary Indicators Secondary Indicators Dry Selection Oxidized Rh Presence of Stunted or S Shallow Aqu Geomorphic Microtopogra Iron Deposits (B5)	
Surface Water (A1)	Surface Water (A1) Surface Soil Cracks (B6) Drainage Pa High Water Table (A2) Inundations Visible on Aerial Imagery (B7) Salt Deposits Saturation (A3) Sparsely Vegetated Concave Surface (B8) Oxidized Rh Water Marks (B1) Hydrogen Sulfide Odor (C1) Presence of Sediment Deposits (B2) Dry Season Water Table (C2) Stunted or S Drift Deposits (B3) Other (Explain in Remarks) Geomorphic Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) FAC-Neutral	tors (2 or more required)
High Water Table (A2)	High Water Table (A2) Saturation (A3) Sparsely Vegetated Concave Surface (B8) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Inundations Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Presence of Stunted or S Shallow Aqu Geomorphic Microtopogra FAC-Neutral	Leaves (B9)
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Water Marks (B1)	Water Marks (B1)	(C5)
Water Marks (B1)	Water Marks (B1) Hydrogen Suitide Odor (C1) Stunted or S Sediment Deposits (B2) Dry Season Water Table (C2) X Shallow Aqu Drift Deposits (B3) Other (Explain in Remarks) Geomorphic Mat of Crust of Algae or Marl (B4) X Microtopogra Iron Deposits (B5) FAC-Neutral	
Sediment Deposits (B2) Dry Season Water Table (C2) Drift Deposits (B3) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Depth (inches): After Table Present? Yes Depth (inches): Dry Season Water Table (C2) Shallow Aquitard (D3) Geomorphic Position (D2) Microtopographic Relief (D4) FAC-Neutral Test (D5) Wetland Hydrology Present? Yes Atturation Present? Yes Depth (inches):	Drift Deposits (B2) Drift Deposits (B3) Other (Explain in Remarks) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Dry Season Water Table (C2) Other (Explain in Remarks) Microtopogra FAC-Neutral	
Drift Deposits (B3) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Cleid Observations: rface Water Present? Atter Table Present? Yes Depth (inches):	Drift Deposits (B3)	
Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Relid Observations: Irface Water Present? Interest Table Present? Yes Depth (inches):	Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) FAC-Neutral	
Field Observations: Inface Water Present? I		
reface Water Present? No Depth (inches): ater Table Present? Yes Depth (inches):	laid Observations	Test (D5)
ater Table Present? Yes Depth (inches): 16 Wetland Hydrology Present? Yes aturation Present? Yes Depth (inches): 10	IDIU CHOST VALIOTIO.	
aturation Present? Yes Depth (inches): 10	rface Water Present? No Depth (inches):	
ocludes capillary fringe)	ater Table Present? Yes Depth (inches): 16 Wetland Hydrolog	y Present? Yes
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	aturation Present? Yes	
	Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	

Project Site: Mustang Developmen	t Project Borough	City: North SI	ope			S	ampling Date	Aug 5, 20
Applicate/Owner: Brooks Range Petr	oleum	-						B-4
nvestigator(s): JBrekken, JO'Brien		Landform (hill	side, terrace	, Huumock, e	to: Terrace n	ear pond	ampling Point	B-4
Local Relief (concave, convex, none):	Concave	SI	ope (%): <	1	45.0			
Subregion:	La	at:	Long		Datum:			
Are climate/hydrologic conditions on the	e site typical for this	time of year?	res .				_	
Are Vegetation?,No Soil? No	or Hydrocabo	n? No	significantly	disturbed?	Are "Normal C	ircumstanc	es" Present?	Yes
Are Vegetation?,No Soil? No	or Hydrocabo	n? No	naturally pr	oblematic?	(If needed, expla	in any answ	ers in Remarks	
SUMMARY OF FINDINGS - Attach sit	e map showing sar	npling point i	ocations, tr	ansects, imp	ortant features	s, etc.		
Hydrophytic Vegetation Present?	Yes		Sampled Are					
Hydric Soils Present?	Yes	within	a Wetland?	Yes				
Wetland Hydrology Present?	Yes							
Remarks:								
VEGETATION (List all species	s in plot)							
Tree Stratum (Use scientific names)		Absolute %Cover	The second section is	Indicator Status	Dominance Te	st worksh	eet:	
1.		76COVEL	Sheries		Number of Don That Are OBL,			(A)
2.					Total Number of		-	- 6.4
				1.0	Species Across			(B)
3.				1	Percent of Don	ninant Spec	ies	
4.	43.				That Are OBL,	FACW, FA	C: 100	(A/B)
Sampling/Shrub Stratum	Tot 50% of total cover:	al Cover: 20%	of total cover		Prevalence			
Salix reticulata		1		FAC	Total % Cov OBL Species	er of: Multip	x 1 = 20	
2. Salix planifolia		1		FACW	FACW Species		x 2 = 164	_
		-			FAC Species	1	x3= 3	
3.					FACU Species	0	x4= 0	_
4.					UPL Species	0	x 5 = 0	
5.					Column Totals:	103	(A) 187	(B)
6.							4.00	
Andrew St.		al Cover: inclu			Prevalence Ind	ex = B/A =	1.82	
Herb Stratum	50% of total cover.	20%	of total cover:		Hydrophytic 1	Vegetation	Indicators:	
Pedicularis sudetica		1		FACW	▼ Dominan			
2. Carex saxatilis		80	Yes	FACW		ce Test is≤		
3. Eriophorum angustifolium		20		OBL			ions' (Provide	
4.					supporting data		The second second	
5.					Problema	tic Hydropi	nytic Vegetati	on' Explain)
					' Indicators of h	ydric soil a	nd wetland h	rdrology must
6.					be present unle	ess disturbe	d or problem	<u>ic.</u>
Z.				-				
8.								
		al Cover: 103	of total course	20.6	popular and a second			
Plot size (radius, or length x width) 1	50% of total cover: 5' radius %	51.5 20% Bare Ground	of total cover: 0	20.6	hydrophytic Veg	etation Pre	esent?	Yes
% Cover of Wetland Bryophytes:		al Cover of Bry		10				

COIL		

0-3 3-14 10 YR 2/2 100 clay loam Organics/soil mix 14-18 10 YR 2/1 90 5B 4/1 (Gley Chart) 50 RM M loamy sand Organics/soil mix 1Type: C=Concentrations, D=Depletions, RM=Reduced Matrix. 2Location: PL=Pore Linings, RC=Root Channel, M=Matrix Hydric Soil Indicators: Indicators for Problematic Hydric Soilss: Histosol or Histel (A1)	(Inches)	Color (moist)	%	Color (moist)			Type1	Locz	Texture Remarks	Remarks
14-19 10 YR 2/1 90 5B 4/1 (Gley Chart) 50 RM M loamy sand Organics/soil mix 17pe: C=Concentrations, D=Depletions, RM=Reduced Matrix. :Location: PL=Pore Linings, RC=Root Channel, M=Matrix Hydric Soil Indicators: Indicators for Problematic Hydric Soils: Histosol or Histel (A1)	0-3									Organic layer
**IType: C=Concentrations, D=Depletions, RM=Reduced Matrix.	3-14	10 YR 2/2	100						clay loam	Organics/soil mix
Hydric Soll Indicators: Indicators for Problematic Hydric Solls: Histosol or Histel (A1)	14-19	10 YR 2/1	90	5B 4/1 (Gley Ch.	art)	50	RM	М	loamy sand	Organics/soil mix
Histosol or Histel (A1)	Type: C=	-Concentrations, I	D=Deple	tions, RM=Reduc	ed Matrix	к.	2Locatio	on: PL=Po	ore Linings, RC=Root	Channel, M=Matrix
Histic Epipedon (A2) Hydrogen Sulfide (A4) Alaska Alpine Swales (TA5) Alaska Redox With 2.5Y Hue Other (Explain in Remarks) Thick Dark Surface (A12) Alaska Redox (A14) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed (A13) Alaska Gleyed Pores (A15) Restrictive Layer (if present): Frozen Depth: 19" bgs PYDROLOGY Wetland Hydrology Indicators: Primary Indicators (any one indicator is sufficient) Frimary Indicators (any one indicator is sufficient) F	Hydric So	oli Indicators:		Indic	ators for	r Prob	lematic H	ydric Soll	S3:	
Hydrogen Sulfide (A4) Thick Dark Surface (A12) Alaska Cleyed (A13) Alaska Cleyed (A13) Alaska Gleyed Pores (A15) Depth: 19° bgs Alaska Gleyed Pores (A15) Alaska Gleyed Poresent? Alaska Gleyed Pores (A15) Alaska Gleyed Poresent? Alaska Gleyed Pores (A15) Alaska Gleyed Poresent? Alaska Gleyed Poresent? Alaska Gleyed Pores (A15) Alaska Gleyed Poresent? Alaska Gleyed Pores (A15) Alaska Gleyed Poresent? Alaska Gleyed Pores (A15) Alaska Gleyed Poresent? Alaska Gleyed Poresent? Alaska Gleyed Pores (A15) Alaska Gleyed Poresent? Alaska Gleyed Pores (A15) Alaska Gleyed Poresent? Alaska Gleyed Poresent? Alaska Carea Plants (D1) Alaska Cleyed Present? Alaska Carea Plants (D1) Alaska Cleyed Present? Alaska	X Histor	sol or Histel (A1)		Г	Alaska	Color	Change (1	A4)4	Г	Alaska Gleyed Without Hue 5Y or
Thick Dark Surface (A12) Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15) Restrictive Layer (if present): Frozen Depth: 19" bgs Barraks: Hydric Solis Present?	T Histic	Epipedon (A2)			Alaska	Alpine	Swales (TA5)		Redder Underlying Layer
Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15) Alaska Gleyed Alaska (A15) Alaska Gleyed Alaska (A15) Alaska Gleyed Alaska (A15) Alaska Gl	Hydro	ogen Sulfide (A4)		I D	Alaska	Redox	With 2.5Y	Hue		Other (Explain in Remarks)
Alaska Redox (A14) and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) 4Give details of color change in Remarks. Restrictive Layer (if present): Frozen	Thick	Dark Surface (A	12)							
Alaska Gleyed Pores (A15) Restrictive Layer (if present): Frozen Depth: 19" bgs Hydric Solls Present? Yes Hydric Solls Present? Yes Prozen Hydric Solls Present? Yes Secondary Indicators (2 or more required) Water Stained Leaves (B9) Water Stained Leaves (B9) Drainage Patterns (B10) Salt Deposits (C5) Oxidized Rhizospheres on Living Roots (6 oxidized Rhizospheres on Living Roots (6 oxidized Rhizospheres on Living Roots (6 oxidized Rhizospheres on Living Roots (7 oxidized Rhizospheres on Living Roots (8 oxidized Rhizospheres (8 oxidized Rhizospheres (8 oxidized Rhizosphere	Alask	ka Gleyed (A13)		₃One	Indicator	r of hy	drophytic v	egetation	, one primary indicate	or of wetland hydrology,
Restrictive Layer (if present): Frozen Depth: 19" bgs Primary Indicators: Primary Indicators (any one indicator is sufficient) Surface Water (A1) Surface Water (A2) Inundations Visible on Aerial Imagery (B7) Saturation (A3) Sparsely Vegetated Concave Surface (B8) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Drift Deposits (B3) Other (Explain in Remarks) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Present? No Depth (inches): Jeter Table Present? Ves Depth (inches): Jeter Table Present? Ves Depth (inches): Depth (inches): Jeter Table Present? Ves Depth (inches): Jeter Table	Alask	ka Redox (A14)							The state of the s	
Depth: 19" bgs Pyprology Wetland Hydrology Indicators: Inimary Indicators (any one indicator is sufficient) Surface Water (A1) Surface Water (A1) Surface Water (A2) Inundations Visible on Aerial Imagery (B7) Saturation (A3) Sparsely Vegetated Concave Surface (B8) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Drift Deposits (B3) Other (Explain in Remarks) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) No Depth (inches): Intace Water Present? Depth (inches): Depth	Alask	ka Gleyed Pores (A15)	4Give	details o	of color	change in	Remarks		
POROLOGY Vetland Hydrology Indicators: Secondary Indicators (2 or more required) Water Stained Leaves (B9) Surface Water (A1) Surface Soil Cracks (B6) Surface Water (A2) Inundations Visible on Aerial Imagery (B7) Saturation (A3) Sparsely Vegetated Concave Surface (B8) Water Marks (B1) Hydrogen Suffide Odor (C1) Sediment Deposits (B2) Drift Deposits (B3) Other (Explain in Remarks) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Wetland Hydrology Present? No Depth (inches): Jeter Table Present? Ves Depth (inches): Dep	Restrictive	Layer (if present): Froz	en					Unidado Sallo Da	Voc
PYDROLOGY Wetland Hydrology Indicators: Primary Indicators (any one indicator is sufficient) Surface Water (A1) Surface Soil Cracks (B6) Surface Water (A1) Surface Soil Cracks (B6) Salt Deposits (C5) Saturation (A3) Sparsely Vegetated Concave Surface (B8) Sutration (A3) Sparsely Vegetated Concave Surface (B8) Secondary Indicators (2 or more required) Water Stained Leaves (B9) Drainage Pattems (B10) Salt Deposits (C5) Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Stunted or Stressed Plants (D1) Shallow Aquitard (D3) Mat of Crust of Algae or Mari (B4) Iron Deposits (B5) Wetland Hydrology Present? Yes Wetland Hydrology Present? Yes Secondary Indicators (2 or more required) Water Stained Leaves (B9) Drainage Pattems (B10) Salt Deposits (C5) Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Shallow Aquitard (D3) Geomorphic Position (D2) Microtopographic Relief (D4) FAC-Neutral Test (D5) Wetland Hydrology Present? Yes Secondary Indicators (2 or more required) Water Stained Leaves (B9) Drainage Pattems (B10) Salt Deposits (C5) Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4) Fresence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Shallow Aquitard (D3) Shallow Aquitard (D3) FAC-Neutral Test (D5) Wetland Hydrology Present? Yes		Jan Jan	_						nyunc sons Fr	Spellit, 100
YDROLOGY Netland Hydrology Indicators: Primary Indicators (any one indicator is sufficient) Surface Water (A1) Surface Soil Cracks (B6) Surface Water Table (A2) Inundations Visible on Aerial Imagery (B7) Saturation (A3) Sparsely Vegetated Concave Surface (B8) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Drift Deposits (B3) Other (Explain in Remarks) Water Observations: Indicators (2 or more required) Water Stained Leaves (B9) Drainage Patterns (B10) Salt Deposits (C5) Oxidized Rhizospheres on Living Roots (C1) Presence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Shallow Aquitard (D3) Geomorphic Position (D2) Microtopographic Relief (D4) FAC-Neutral Test (D5) Field Observations: Indicators (2 or more required) Water Stained Leaves (B9) Drainage Patterns (B10) Salt Deposits (C5) Oxidized Rhizospheres on Living Roots (C1) Presence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Shallow Aquitard (D3) Geomorphic Position (D2) Microtopographic Relief (D4) FAC-Neutral Test (D5) Field Observations: Indicators (2 or more required) Water Stained Leaves (B9) Drainage Patterns (B10) Salt Deposits (C5) Oxidized Rhizospheres on Living Roots (C1) Fresence of Reduced Iron (C4) Fresence o										_
Surface Water (A1)		14 ogs	<u> </u>							
High Water Table (A2)	marks:	GY	rs:						Secondary Ir	ndicators (2 or more required)
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Dry Season Water Table (C2) Drift Deposits (B3) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Field Observations: Irface Water Present? We saturation Present? Yes Presence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Shallow Aquitard (D3) Geomorphic Position (D2) Microtopographic Relief (D4) FAC-Neutral Test (D5) Wetland Hydrology Present? Yes Pes Depth (inches): Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Shallow Aquitard (D3) Geomorphic Position (D2) Microtopographic Relief (D4) FAC-Neutral Test (D5) Wetland Hydrology Present? Yes Pes Depth (inches): Outline Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Shallow Aquitard (D3) Geomorphic Position (D2) Microtopographic Relief (D4) FAC-Neutral Test (D5) Wetland Hydrology Present? Yes Pes Depth (inches): Outline Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Shallow Aquitard (D3) Geomorphic Position (D2) Microtopographic Relief (D4) FAC-Neutral Test (D5) Wetland Hydrology Present? Yes Pes Depth (inches): Outline Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Shallow Aquitard (D3) Geomorphic Position (D2) Microtopographic Relief (D4) FAC-Neutral Test (D5) Wetland Hydrology Present? Yes	POROLO Vetland Hydrol	GY drology Indicato		s sufficient)					1	A-12 A-12 A-12 A-12 A-12 A-12 A-12 A-12
Water Marks (B1)	Marks: /DROLO /etland Hydrimary India Surface	GY drology Indicato cators (any one in e Water (A1)		Surface S					Water Sta	ained Leaves (B9) e Patterns (B10)
Water Marks (B1)	PROLO Fetland Hydrimary India Surface High W	GY drology Indicato cators (any one in e Water (A1) Vater Table (A2)		Surface S	s Visible	on Ae	erial Image		Water Sta	ained Leaves (B9) e Patterns (B10) osits (C5)
Drift Deposits (B3)	POROLO Vetland Hydrimary India Surface High W	GY drology Indicato cators (any one in e Water (A1) Vater Table (A2) tion (A3)		Surface S Inundation Sparsely	ns Visible Vegetate	on Ae	erial Image cave Surfa		Water Sta	ained Leaves (B9) e Patterns (B10) osits (C5) Rhizospheres on Living Roots (C
Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Microtopographic Relief (D4) FAC-Neutral Test (D5) Depth (inches): atter Table Present? Yes Depth (inches):	POROLO Vetland Hydrimary India Surface High W Saturat Water	GY drology indicato cators (any one in e Water (A1) Vater Table (A2) tion (A3) Marks (B1)		Surface S Inundation Sparsely Hydrogen	ns Visible Vegetate n Sulfide	on Ae ed Con Odor (erial Image cave Surfa C1)		Water Sta Drainage Salt Dep Oxidized Presence	ained Leaves (B9) e Patterns (B10) osits (C5) I Rhizospheres on Living Roots (C5) e of Reduced Iron (C4)
Iron Deposits (B5) FAC-Neutral Test (D5) Face Water Present? Atter Table Present? Yes Depth (inches):	POROLO Vetland Hydrimary India Surface X High W X Satural Water Sedime	GY drology Indicato cators (any one in e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2)		Surface S Inundation Sparsely Hydrogen Dry Seas	ns Visible Vegetate Sulfide on Water	e on Ae ed Con Odor (r Table	erial Image cave Surfa C1) (C2)		Water Sta Drainage Salt Dep Oxidized Presence Stunted	ained Leaves (B9) e Patterns (B10) osits (C5) l Rhizospheres on Living Roots (C3 e of Reduced Iron (C4) or Stressed Plants (D1)
Field Observations: Inface Water Present? I	POROLO Vetland Hydrimary India Surface High W Saturat Water Sedime	drology Indicato cators (any one in e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3)	dicator is	Surface S Inundation Sparsely Hydrogen Dry Seas Other (E)	ns Visible Vegetate Sulfide on Water	e on Ae ed Con Odor (r Table	erial Image cave Surfa C1) (C2)		Water Sta Drainage Salt Dep Oxidized Presenc Stunted Shallow Geomore	ained Leaves (B9) a Patterns (B10) osits (C5) l Rhizospheres on Living Roots (C5) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2)
Auturation Present? Yes Depth (inches): Depth (inches)	POROLO Vetland Hydrimary India Surface High W Satural Water Sedime Drift De Mat of	GY drology Indicato cators (any one in e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or	dicator is	Surface S Inundation Sparsely Hydrogen Dry Seas Other (E)	ns Visible Vegetate Sulfide on Water	e on Ae ed Con Odor (r Table	erial Image cave Surfa C1) (C2)		Water Sta Drainage Salt Dep Oxidized Presenc Stunted Shallow Geomon Microtop	ained Leaves (B9) a Patterns (B10) osits (C5) l Rhizospheres on Living Roots (C5) a of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) oographic Relief (D4)
ater Table Present? Yes Depth (inches): 5 Wetland Hydrology Present? Yes aturation Present? Yes Depth (inches): 0	POROLO Vetland Hydrimary India Surface High W Satural Water Sedime Drift De Mat of	GY drology Indicato cators (any one in e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or	dicator is	Surface S Inundation Sparsely Hydrogen Dry Seas Other (E)	ns Visible Vegetate Sulfide on Water	e on Ae ed Con Odor (r Table	erial Image cave Surfa C1) (C2)		Water Sta Drainage Salt Dep Oxidized Presenc Stunted Shallow Geomon Microtop	ained Leaves (B9) a Patterns (B10) osits (C5) l Rhizospheres on Living Roots (C5) a of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) oographic Relief (D4)
aturation Present? Yes Depth (inches): 0 Includes capillary fringe)	POROLO Vetland Hydrimary India Surface High W Satural Water Sedime Drift De	drology Indicato cators (any one in e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5)	dicator is	Surface S Inundation Sparsely Hydrogen Dry Seas Other (E)	ns Visible Vegetate Sulfide on Water	e on Ae ed Con Odor (r Table	erial Image cave Surfa C1) (C2)		Water Sta Drainage Salt Dep Oxidized Presenc Stunted Shallow Geomon Microtop	ained Leaves (B9) a Patterns (B10) osits (C5) l Rhizospheres on Living Roots (C5) a of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) oographic Relief (D4)
aturation Present? Yes Depth (inches): 0	POROLO Vetland Hydrimary India Surface High W Saturat Water Sedima Drift De Mat of Iron De	drology indicato cators (any one in e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5)	dicator is	Surface S Inundation Sparsely Hydrogen Dry Seas Other (Ex	ns Visible Vegetate I Sulfide on Water oplain in I	on Ae ed Con Odor (r Table Remar	erial Image cave Surfa C1) e (C2) ks)		Water Sta Drainage Salt Dep Oxidized Presenc Stunted Shallow Geomon Microtop	ained Leaves (B9) a Patterns (B10) osits (C5) l Rhizospheres on Living Roots (C5) a of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) oographic Relief (D4)
aturation Present? Yes ncludes capillary fringe)	POROLO Vetland Hydrimary India Surface Water Sedima Drift Do Mat of Iron De	drology Indicato cators (any one in e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations:	Mari (B4	Surface S Inundation Sparsely Hydrogen Dry Seas Other (Ex	ns Visible Vegetate i Sulfide on Water cplain in I	e on Ae ed Corr Odor (r Table Remar	erial Image cave Surfa C1) (C2) ks)		Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop FAC-Ne	ained Leaves (B9) a Patterns (B10) osits (C5) l Rhizospheres on Living Roots (C5) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) oographic Relief (D4) utral Test (D5)
	POROLO Vetland Hydrimary India Surface Water Water Sedime Drift De Iron De Ield Obser	drology Indicato cators (any one in e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations: r Present?	Mari (B	Surface S Inundation Sparsely Hydrogen Dry Seas Other (Ex	ns Visible Vegetate i Sulfide on Water oplain in I Dep	e on Ae ed Con Odor (r Table Reman	erial Image cave Surfa C1) a (C2) ks) hes):		Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop FAC-Ne	ained Leaves (B9) a Patterns (B10) osits (C5) l Rhizospheres on Living Roots (C5) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) oographic Relief (D4) utral Test (D5)
	Property of the control of the contr	drology Indicato cators (any one in e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations:	Mari (B	Surface S Inundation Sparsely Hydrogen Dry Seas Other (Ex	ns Visible Vegetate i Sulfide on Water oplain in I Dep	e on Ae ed Con Odor (r Table Reman	erial Image cave Surfa C1) a (C2) ks) hes):		Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop FAC-Ne	ained Leaves (B9) a Patterns (B10) osits (C5) l Rhizospheres on Living Roots (C5) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) oographic Relief (D4) utral Test (D5)
	POROLO Vetland Hydrimary India Surface Water Sedima Drift Do Mat of Iron De Ield Observater Table F turation Precludes cap	GY drology Indicato cators (any one in e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations: r Present? Present? esent?	Mari (B4	Surface S Inundation Sparsely Hydrogen Dry Seas Other (Ex	ns Visible Vegetate i Sulfide on Water cplain in I Depr	e on Ae ed Con Odor (or Table Reman	erial Image cave Surfa C1) (C2) (C2) (ks)	5 0	Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop X FAC-Ne	ained Leaves (B9) a Patterns (B10) osits (C5) l Rhizospheres on Living Roots (C5) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) oographic Relief (D4) utral Test (D5)

Project Site: Mustang Developme	The second secon	-			Sampling Da	te Aug 6,
Applicate/Owner: Brooks Range Pe	7-1-1		**	V	Sampling Po	int: B-5
nvestigator(s): JBrekken, JO'Brien ocal Relief (concave, convex, none)		CONTRACTOR OF STREET	side, terrace ope (%): <	, Huumock, e 1	te: Hummocks, micro	
Subregion:	Lat	-	Long		Datum:	
Are climate/hydrologic conditions on				-		
				0. 17.4	Same and the second	
Are Vegetation?,No Soil? No	or regardador.		naturally pr	disturbed?	Are "Normal Circumstances" Presen (If needed, explain any answers in Remar	
re Vegetation?,No Soil? No						
UMMARY OF FINDINGS - Attach s			ocations, tra Sampled Are		ortant features, etc.	
lydrophytic Vegetation Present?	Yes		a Wetland?	Yes		
lydric Soils Present?	Yes					
Vetland Hydrology Present?	Yes					
Remarks:			_			
EGETATION (List all speci	es in plot)	11771				
Tree Stratum (Use scientific name	es)	Absolute %Cover		Statue	Dominance Test worksheet: Number of Dominant Species	
1.					That Are OBL, FACW, or FAC: 3	(A)
2.					Total Number of Dominant	-
3.					Species Across All Strata: 4	(B)
4.					Percent of Dominant Species That Are OBL, FACW, FAC: 75	(A/B)
		Cover:			Prevalence Index:	1121
Sampling/Shrub Stratum	50% of total cover:		of total cover:	100	Total % Cover of: Multiplied by:	
1. Salix reticulata		5		CCV-5-11	OBL Species 15 x 1 = 15	
2. Salix planifolia		8	Yes	FACW	FACW Species 50 $\times 2 = 100$ FAC Species 7 $\times 3 = 21$)
3. Salix fuscenscens		5		EVOKA	FAC Species 7 x 3 = 21 FACU Species 21 x 4 = 84	
4. Dryas integrifolia		20	Yes	FACU	UPL Species 0 x5= 0	
5. Cassiope tetragona		1		FACU	Column Totals: 93 (A) 220	(B)
6.				100		
The second second		Cover: 39	See a comment		Prevalence Index = B/A = 2.37	
Herb Stratum	50% of total cover:	19.5 20%	of total cover:	7.8	Hydrophytic Vegetation Indicator	
Pedicularis sudetica		2		FACW	☑ Dominance Test is >50%	
2. Carex saxatilis		35	Yes	FACW	Prevalence Test is ≤3.0	
3. Eriophorum angustifolium		15	Yes	OBL	Morphological Adaptions' (Provi	ide
4. Poa arctica		2		EAC S	supporting data in Remarks or on a sp	
5.				10	Problematic Hydrophytic Veget	ation' Explain)
6.					'Indicators of hydric soil and wetland	
7					be present unless disturbed or proble	amic.
0				-		
8.	Total	Cover: 54				
Name of State of St. 7	50% of total cover:		of total cover.	10.8	Hydrophytic Vegetation Present?	Yes
Plot size (radius, or length x width)		Bare Ground			A STATE OF THE STA	T.
% Cover of Wetland Bryophytes:	5 Total	Cover of Bry	ophytes:	5		

SOIL		
SOUTH		

(Inches)	Color (moist)	%	Color (m	noist)	%	Type ₁	Locz	Texture Remarks	Remarks
0-2									Organic layer
2-4	2.5 Y 2.5/1	100						clay loam	Organics/soil mix
4-18	2.5 Y 4/3	80	5 YR 4/6		20	RM	М	sandy clay loam	Organics/soil mix
18-20	2.5 Y 2.5/1	100			_			sandy loam	w/ decomposing organics
Type: C	=Concentrations, I	D≃Deple	tions, RM=Re	educed N	Matrix.	2Locatio	on: PL=P	ore Linings, RC=Root	Channel, M=Matrix
Hydric Sc	oll indicators:		- 1	indicator	s for Prob	lematic H	ydric Sol	Is:	
X Histo	sol or Histel (A1)			☐ Ala	aska Color	Change (T	A4)4	Γ.	Alaska Gleyed Without Hue 5Y or
T Histic	Epipedon (A2)			T Ala	aska Alpine	Swales (1	TA5)	F	Redder Underlying Layer
Hydr	ogen Sulfide (A4)			T Ala	ska Redox	With 2.5Y	Hue		Other (Explain in Remarks)
Thick	Dark Surface (A1	12)							
The same of the sa	ca Gleyed (A13)		3	One Indi	cator of hy	drophytic v	egetation	, one primary indicato	r of wetland hydrology,
	ka Redox (A14)						William Fact	nust be present.	
	a Gleyed Pores (A15)			ails of colo				
Restrictive	Layer (if present): None	encountere	d		_		110000000	
		140110	- Ditto Gainesto	-				Hydric Solls Pre	esent? Yes
		-							
Depth:									
Depth:	GY drology Indicator	rs:						Secondary In	dicators (2 or more required)
Depth: marks: /DROLO /etland Hy	A STATE OF THE PARTY OF THE PAR		s sufficient)						dicators (2 or more required) ined Leaves (B9)
Depth: marks: DROLO fetland Hyrimary India	drology Indicato			ace Soil (Cracks (B6)			Water Sta	
Depth: marks: /DROLO /etland Hy- nimary India Surface	drology Indicator cators (any one in		Surfa		Cracks (B6)		ry (B7)	Water Sta	ined Leaves (B9)
Depth: marks: DROLO [etland Hydrimary India Surface High W	drology Indicator cators (any one in e Water (A1)		Surfa	lations Vi		erial Image		Water Sta Drainage Salt Depo	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C3
Depth: marks: /DROLO fetland Hy rimary India Surface High W	drology Indicator cators (any one in e Water (A1) Vater Table (A2)		Surfa	lations Vi sely Veg	sible on A	erial Image Icave Surfa		Water Sta Drainage Salt Depo Oxidized Presence	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) e of Reduced Iron (C4)
Depth: marks: /DROLO /etland Hy mimary India Surface High W Satural Water	drology Indicator cators (any one in e Water (A1) Vater Table (A2) tion (A3)		Surfa	lations Vi sely Veg ogen Sul	sible on Ae	erial Image cave Surfa (C1)		Water Sta Drainage Salt Depo Oxidized Presence	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C3 of Reduced Iron (C4) or Stressed Plants (D1)
Depth: marks: DROLO fetland Hydimary India Surface High W Satural Water Sedime	drology Indicator cators (any one in e Water (A1) /ater Table (A2) tion (A3) Marks (B1)		Surfa	lations Vi sely Veg rogen Sul Season V	isible on Ae etated Con lfide Odor (erial Image Icave Surfa (C1) e (C2)		Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C3 of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3)
Depth: marks: DROLO [etland Hy rimary India Surface High W Satural Water Sedime Drift D	drology Indicator cators (any one in e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3)	dicator is	Surfa Inund Span Hydra Dry S	lations Vi sely Veg rogen Sul Season V	isible on Ae etated Con ffide Odor (Vater Table	erial Image Icave Surfa (C1) e (C2)		Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2)
Depth: marks: /DROLO fetland Hy mimary India Surface High W Satural Water Sedime Drift D Mat of	drology Indicator cators (any one ince e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or	dicator is	Surfa Inund Span Hydra Dry S	lations Vi sely Veg rogen Sul Season V	isible on Ae etated Con ffide Odor (Vater Table	erial Image Icave Surfa (C1) e (C2)		Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow Geomorp Microtopo	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4)
Depth: marks: /DROLO fetland Hy mimary India Surface High W Satural Water Sedime Drift D Mat of	drology Indicator cators (any one in e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3)	dicator is	Surfa Inund Span Hydra Dry S	lations Vi sely Veg rogen Sul Season V	isible on Ae etated Con ffide Odor (Vater Table	erial Image Icave Surfa (C1) e (C2)		Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow Geomorp Microtopo	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2)
Depth: marks: DROLO fetland Hy rimary India Surface High W Satural Water Sedime Drift D Mat of Iron De	drology Indicator cators (any one ince Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations:	Marl (B4	Surfa Inund Span Hydn Dry S Othe	lations Vi sely Vegrogen Sul Season V er (Explai	isible on Ae etated Con Ifide Odor (Vater Table n in Reman	erial Image acave Surfa (C1) e (C2) rks)		Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow Geomorp Microtopo	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4)
Depth: marks: DROLO [etland Hydrimary India Surface High W Satural Water Sedima Drift D Mat of	drology Indicator cators (any one ince Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations:	Marl (B4	Surfa Inund Span Hydra Dry S	lations Vi sely Vegrogen Sul Season V er (Explai	isible on Ae etated Con ffide Odor (Vater Table	erial Image acave Surfa (C1) e (C2) rks)		Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow Geomorp Microtopo	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4)
Depth: marks: DROLO fetland Hy rimary India Surface High W Satural Water Sedime Drift D Mat of Iron De	drology Indicator cators (any one ince Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations: r Present?	Mart (B4	Surfa Inund Span Hydn Dry S Othe	lations Vi sely Veg rogen Sul Season V er (Explai	isible on Ae etated Con Ifide Odor (Vater Table n in Reman	erial Image icave Surfa (C1) e (C2) rks)		Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow Geomorp Microtope FAC-Neu	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4)
Depth: marks: DROLO letland Hy mary India Surface High W Satural Water Sedime Drift D Mat of Iron De letd Obser face Water ter Table F	drology Indicator cators (any one ince e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations: r Present? esent?	Mart (B4	Surfa Inund Span Hydri Dry S Othe	lations Vi sely Vegrogen Sul Season V	isible on Ae etated Con ifide Odor (Vater Table in in Reman	erial Image cave Surfa (C1) e (C2) rks) hes):	ace (B8)	Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow Geomorp Microtope FAC-Neu	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4) utral Test (D5)
Depth: marks: /DROLO /etland Hy mary India Surface High W Satural Water Sedima Drift D Mat of Iron De eld Observator Table F turation Precludes cap	drology Indicator cators (any one incettors (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations: r Present?	Mari (B4	Surfa Inund Span Hydra Dry S Othe	lations Vi sely Vege rogen Sul Season V	etated Con etated Con ifide Odor (Vater Table in in Reman Depth (inco	erial Image (C1) e (C2) rks) hes): hes):	20 4	Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow / Geomorp Microtopo FAC-Neu	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4) utral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Applicate/Owner: Brooks Range Pet	roleum					n	
nvestigator(s): JBrekken, JO'Brien	La	ndform (hills	side, terrace	Huumock,	etc: Hummocks/tu	Sampling Point:	B-6
ocal Relief (concave, convex, none);	None	Sid	pe (%): 0-	1		-	
Subregion:	Lat		Long		Datum:		
re climate/hydrologic conditions on th	e site typical for this tim	e of year? Y	'es				
re Vegetation?,No Soil? No	or Hydrocabon?	No	significantly	disturbed?	Are "Normal Circums	tances" Present?	Yes
are Vegetation?,No Soil? No	or Hydrocabon?	No	naturally pr	oblematic?	(If needed, explain any a	answers in Remarks)	
UMMARY OF FINDINGS - Attach sit	e map showing samp	ing point is	ocations, tr	ansects, Im	portant features, etc.		
lydrophytic Vegetation Present?	Yes	Is the S	Sampled Are	а			
lydric Soils Present?	Yes	within	a Wetland?	Yes			
Vetland Hydrology Present?	Yes						
Remarks:							
EGETATION (List all specie	s in plot)				A		
Tree Stratum (Use scientific names		Absolute %Cover	Dominant Species	Indicator Status	Dominance Test wo	rksheet:	
1.		2000101	Opunus	Mana	Number of Dominant That Are OBL, FACW		(A)
2.					Total Number of Dom	inant	
3.					Species Across All St	A STATE OF THE STATE OF T	(B)
4.					Percent of Dominant That Are OBL, FACW		(A/B)
Sampling/Shrub Stratum	Total 0		of total cover		Prevalence Index:		
Salix reticulata	3578 57 1514 55151	5	0,1012,00101	FAC	Total % Cover of: N OBL Species 15	Aultiplied by: x 1 = 15	
2. Salix planifolia		10		FACW	OBL Species 15 FACW Species 52	- x 2 = 104	-
3. Salix arctica		5		FAC	FAC Species 11	x 3 = 33	5)
4. Dryas integrifolia		30	Yes	FACU	FACU Species 32	x 4 = 128	
			165		UPL Species 0	x5= 0	— (B)
5. Cassiope tetragona		2		FACU	Column Totals: 110	(A) 280	_ (6)
<u>6.</u>	Total C	cover: 52			Prevalence Index = B	/A = 2.55	
Herb Stratum	50% of total cover. 26	000/	of total cover:	10.4	3.3.3.4.2.0.3		-
Polygonum viviparum		1		FAC	Hydrophytic Vegeta	ntion Indicators:	
2. Carex saxatilis		40	Yes	FACW	□ Dominance Tes		
				000000	Prevalence Tes		
3. Eriophorum angustifolium		15	Yes	OBL	Morphological A supporting data in Ren	daptions' (Provide	rato choo
4. Eriophorum vaganitum		2		FACW	Problematic Hy	싫어된다. 이 경험에 보였다.	
5.					'Indicators of hydric s		ONE PLEASE
6.					be present unless dis		
7.							
8.							
	Total C			44.6		A STATE OF	
	50% of total cover: 29	20%	of total cover:	11.6	Hydrophytic Vegetation	n Present?	es .

Remarks: Located in 'pond complex' or within group of ponds. Lichens present (fruticose and crustose). Micro-lows (trenches and depressions) have standing water.

SOIL

1	B-6

0-2									Organic	laver	
2-4	2.5 YR 2.5/2	100						loamy sand		s/soil mix	_
											_
4-18	5 Y 2.5/1	100						sandy loam	Organio	cs/soil mix	
Type: C	=Concentrations, I)=Depletions	, RM=Reduc	ed Matrix	×.	2Locatio	on: PL=Po	ore Linings, RC=R	oot Channel	M=Matrix	_
Hydric S	oll Indicators:		Indic	ators fo	r Probl	ematic H	ydric Sol	lsa:			
X Histo	osol or Histel (A1)		Г	Alaska	Color (Change (TA4)4	- 1	Alaska G	leyed With	out Hue 5Y or
Histi	c Epipedon (A2)		16	Alaska	Alpine	Swales (TA5)		Redder U	nderlying L	ayer
Hyd	rogen Sulfide (A4)			Alaska	Redox	With 2.5	/ Hue	T	Other (E	xplain in Re	emarks)
Thic	k Dark Surface (A1	2)									
T Alas	ka Gleyed (A13)		3One	Indicato	r of hyd	rophytic	egetation	, one primary indic	ator of wetla	nd hydrolo	gy,
Alas	ka Redox (A14)		and a	an appro	priate la	andscape	position n	nust be present.			
T Alas	ka Gleyed Pores (A15)	4Give	details	of color	change i	Remarks	5.			
Restrictiv	e Layer (if present)	Frozen						The state of the s		200	
								Hydric Salle	Present?	Yes	
	31910 7117	110201						riyana dons			
Depth:	18" bgs						_	Tryunc Solis			
Depth:	18" bgs			-					y Indicators (2 or more	required)
Depth:	18" bgs		icient)_					Secondar	y Indicators (Stained Leav	70.75	required)
Depth: marks: /DROLO /etland Hy	18" bgs		ficient)	Soil Craci	ks (B6)			Secondar Water Drain	Stained Leav	ves (B9) (B10)	required)
Depth: PMOLO Petland Hy rimary Indi Surface	18" bgs OGY rdrology Indicator icators (any one inc		22 3 7 5 1 1 1				ery (B7)	Secondar Water Drain: Salt D	Stained Leavage Patterns Deposits (C5)	ves (B9) (B10)	
Depth: POROLO Petland Hy rimary Indi Surface High V	OGY rdrology Indicator icators (any one ince we Water (A1)		Surface S	ns Visible	on Ae	rial Image		Secondar Water Drain Salt D Oxidia	Stained Leavage Patterns Deposits (C5) Led Rhizosph	ves (B9) (B10) neres on Li	ving Roots (C3
Depth: PMOLO Petland Hy rimary Indi Surfac High V Satura	OGY rdrology Indicator icators (any one incise Water (A1) Vater Table (A2)		Surface S Inundation	ns Visible Vegetate	on Aer	rial Image cave Surf		Secondar Water Drain: Salt D Oxidia	Stained Leavage Patterns Deposits (C5) and Rhizosphance of Redu	ves (B9) (B10) neres on Lir ced Iron (C	ving Roots (C3
Depth: Primary Indi Surface High V Satura Water	OGY rdrology Indicator icators (any one ince Water (A1) Vater Table (A2)		Surface S Inundation Sparsely	ns Visible Vegetate n Sulfide	on Aer ed Cond Odor (C	rial Image cave Surfa C1)		Secondar Water Drain Salt D Oxidia Prese Stunt	Stained Leavage Patterns Deposits (C5) Zed Rhizosphence of Redu ed or Stresse	ves (B9) (B10) neres on Linced Iron (Ced Plants (I	ving Roots (C3
Depth: Primary Indi Surface High W Satura Water Sedim	OGY Idrology Indicator icators (any one ince Water (A1) Vater Table (A2) Intion (A3) Marks (B1)		Surface S Inundation Sparsely Hydrogen	ns Visible Vegetate n Sulfide on Wate	e on Aer ed Cond Odor (C r Table	rial Image cave Surfa C1) (C2)		Secondar Water Drain Salt D Oxidia Prese Stunt Shalk	Stained Leavage Patterns Deposits (C5) Ded Rhizosphence of Redu ed or Stresse Dow Aquitard (ves (B9) (B10) neres on Lir ced Iron (Ced Plants (ID3)	ving Roots (C3
Depth: Primarks: Portland Hyrimary Indi Surface High V Satura Water Sedim Drift D	OGY vdrology Indicator icators (any one ince we Water (A1) Vater Table (A2) ition (A3) Marks (B1) itent Deposits (B2)	rs: dicator is suff	Surface S Inundation Sparsely Hydrogen Dry Seas	ns Visible Vegetate n Sulfide on Wate	e on Aer ed Cond Odor (C r Table	rial Image cave Surfa C1) (C2)		Secondar Water Drain: Salt D Oxidia Prese Stunt Shalk	Stained Leavage Patterns Deposits (C5) Zed Rhizosphence of Redu ed or Stresse	ves (B9) (B10) neres on Liced Iron (Ced Plants (ID3) ion (D2)	ving Roots (C3 (4) (21)
Depth: Primary Indi Surface High V Satura Water Sedim Drift D Mat of	OGY Idrology Indicator icators (any one incise Water (A1) Vater Table (A2) ition (A3) Marks (B1) itent Deposits (B2) deposits (B3)	rs: dicator is suff	Surface S Inundation Sparsely Hydrogen Dry Seas	ns Visible Vegetate n Sulfide on Wate	e on Aer ed Cond Odor (C r Table	rial Image cave Surfa C1) (C2)		Secondar Water Drains Salt D Oxidia Prese Stunt Shalk Geom	Stained Leavage Patterns Deposits (C5) Ded Rhizosphence of Redu ed or Stresse Dow Aquitard (norphic Positi	ves (B9) (B10) heres on Liced Iron (Ced Plants (ID3) ion (D2) Relief (D4)	ving Roots (C3 (4) (21)
Depth: Primary Indi Surface High V Satura Water Sedim Drift D Mat of	OGY Idrology Indicator Idrology	rs: dicator is suff	Surface S Inundation Sparsely Hydrogen Dry Seas	ns Visible Vegetate n Sulfide on Wate	e on Aer ed Cond Odor (C r Table	rial Image cave Surfa C1) (C2)		Secondar Water Drains Salt D Oxidia Prese Stunt Shalk Geom	Stained Leavage Patterns Deposits (C5) Deed Rhizosphence of Redu ed or Stresse Dow Aquitard (norphic Positi topographic	ves (B9) (B10) heres on Liced Iron (Ced Plants (ID3) ion (D2) Relief (D4)	ving Roots (C3 (4) (21)
Depth: Primarks: Portland Hyrimary Indi Surface High V Satura Water Sedim Drift D Mat of Iron D	OGY Idrology Indicator Idrology	rs: dicator is suff	Surface S Inundation Sparsely Hydrogen Dry Seas	ns Visible Vegetate n Sulfide on Wate xplain in	e on Aer ed Cond Odor (C r Table	rial Image cave Surfa C1) (C2) (ss)		Secondar Water Drains Salt D Oxidia Prese Stunt Shalk Geom	Stained Leavage Patterns Deposits (C5) Deed Rhizosphence of Redu ed or Stresse Dow Aquitard (norphic Positi topographic	ves (B9) (B10) heres on Liced Iron (Ced Plants (ID3) ion (D2) Relief (D4)	ving Roots (C3 (4) (21)
Depth: Primarks: Portland Hyrimary Indi Surface High V Satura Water Sedim Drift D Mat of Iron D	OGY Idrology Indicator Idrology	rs: dicator is suff	Surface S Inundation Sparsely Hydrogen Dry Seas	ns Visible Vegetate n Sulfide on Wate kplain in Dep	e on Aered Cond Odor (C r Table Remark	rial Image cave Surfi C1) (C2) (s)		Secondar Water Drain Salt D Oxidia Prese Stunt Shalk Geom Micro FAC-	Stained Leavage Patterns Deposits (C5) Deed Rhizosphence of Redu ed or Stresse Dow Aquitard (norphic Positi topographic	ves (B9) (B10) Heres on Linced Iron (Ced Plants (ID3) Honor (D2) Relief (D4) (D5)	ving Roots (C3 (4) (21)
Depth: Primarks: Proposition of the primary Indi Surface High Water Sedim Drift D Mat of Iron D Find Observation Procludes cap	DGY vdrology Indicator icators (any one ince Water (A1) Vater Table (A2) intion (A3) Marks (B1) itent Deposits (B2) Deposits (B3) f Crust of Algae or reposits (B5) rvations: re Present? Present?	Marl (B4)	Surface S Inundation Sparsely Hydrogen Dry Seas Other (Ex	ns Visible Vegetate n Sulfide on Wate kplain in Dep Dep	e on Aered Conc Odor (C r Table Remark th (inch th (inch	rial Image cave Surfic C1) (C2) (s)	17 0	Secondar Water Drain: Salt D Oxidia Prese Stunt Shalk Geom Micro FAC-	Stained Leavage Patterns Deposits (C5) Deed Rhizosphence of Redu ed or Stresse Dow Aquitard (Drophic Posit Topographic Neutral Test	ves (B9) (B10) Heres on Linced Iron (Ced Plants (ID3) Honor (D2) Relief (D4) (D5)	ving Roots (C3 (4) (21)
Depth: Primarks: Proposition of the primary Indi Surface High Water Sedim Drift D Mat of Iron D Find Observation Procludes cap	DGY Vorology Indicator icators (any one ince Water (A1) Vater Table (A2) Ition (A3) Marks (B1) Itent Deposits (B3) Forust of Algae or eposits (B5) Invations: In Present? Present?	Marl (B4)	Surface S Inundation Sparsely Hydrogen Dry Seas Other (Ex	ns Visible Vegetate n Sulfide on Wate kplain in Dep Dep	e on Aered Conc Odor (C r Table Remark th (inch th (inch	rial Image cave Surfic C1) (C2) (s)	17 0	Secondar Water Drain: Salt D Oxidia Prese Stunt Shalk Geom Micro FAC-	Stained Leavage Patterns Deposits (C5) Deed Rhizosphence of Redu ed or Stresse Dow Aquitard (Drophic Posit Topographic Neutral Test	ves (B9) (B10) Heres on Linced Iron (Ced Plants (ID3) Honor (D2) Relief (D4) (D5)	ving Roots (C3 (4) (21)

Project Site: Mustang Developme	200 May 200 Ma	my:NOITH 3	ope			Samplin	g Date	Aug 6,
Applicate/Owner: Brooks Range Pet						Samplin	g Point:	B-7
nvestigator(s): JBrekken, JO'Brien				, Huumock, e	tc: Hummocl	CS		1
Local Relief (concave, convex, none):		-	ope (%): 0-		- 3			
Subregion:	Lat:		Long		Datum:			
re climate/hydrologic conditions on the	ne site typical for this tin	ne of year?	res					
Are Vegetation?,No Soil? No	or Hydrocabon?	? No	significantly	disturbed?		cumstances" Pr		Yes
Are Vegetation?, No Soil? No	or Hydrocabon	? No	naturally pr	oblematic?	(If needed, explain	n any answers in R	temarks)	
UMMARY OF FINDINGS - Attach s	ite map showing samp	oling point i	ocations, tr	ansects, Imp	ortant features,	etc.		
lydrophytic Vegetation Present?	Yes		Sampled Are a Wetland?					
Hydric Soils Present?	Yes	With	a vveuariu?	165				
Netland Hydrology Present?	Yes							
Remarks:								
EGETATION (List all specie	es in plot)							
Tree Stratum (Use scientific name:	5)	Absolute %Cover	Dominant Species	Status	Dominance Tes			
1.	,	76COVEL	Sheries	70000000	Number of Domi That Are OBL, F		2	(A)
2.					Total Number of			- **
3.					Species Across		2	(B)
					Percent of Domi	nant Species		
4.	Tetal	Cover:			That Are OBL, F	NAME OF TAXABLE PARTY.	100	(A/B)
Sampling/Shrub Stratum	50% of total cover.	to soles.	of total cover		Prevalence II	ndex: r of: Multiplied b		
1. Salix reticulata		2		EAC	OBL Species	71 x1=		
2. Salix ovalifolia		2		-203	FACW Species		-	-
3.					FAC Species	25 x 3 =	75	
4				15	FACU Species	0 x4=	0	
£					UPL Species	0 x5=	0	— (B)
<u>5.</u> 6.				l i	Column Totals:	96 (A)	146	
×.	Total	Cover: Trea	t w/ herb stratu	ım	Prevalence Inde	x = B/A = 1.5	2	
Herb Stratum	50% of total cover:	Particular and the second	of total cover:	the state of the s			=	-
Polygonum viviparum		ì		EAC	Hydrophytic V	egetation indic	cators:	
			Von		▼ Dominance	e Test is >50%		
2. Carex podocarpa		20	Yes	FAC	X Prevalence	e Test is ≤3.0		
3. Eriophorum angustifolium		70	Yes	OBL	. H. 1868 . The Color of the	ical Adaptions' (1112
Saxifraga hirculus		1		OBL	supporting data in	n Remarks or or ic Hydrophytic V		DE DAGE
5.					A CLIEBTIN	202728040		
6.					'Indicators of hy be present unles			
7.								
8.								
	Total	Cover: 96					Ø.	
Plot size (radius, or length x width)	50% of total cover: 4		of total cover:	19.2 F	lydrophytic Vege	etation Present?	1	es es
% Cover of Wetland Bryophytes:	Total	Bare Ground	. 0					

001	
S. 11	

0-2								Organic layer
2-10	5 YR 3/2	100					loam	High interspersion of organics
		V-20			_			
10-14	10 YR 3/2	100					loam	Organics/soil mix
Type: C	=Concentrations, D	=Depletion	s, RM=Reduc	ed Matrix.	2Loc	ation: PL=P	ore Linings, RC=Roo	t Channel, M=Matrix
Hydric S	oli indicators:		Indic	ators for Pr	oblematic	Hydric Sol	lss:	
X Histo	osol or Histel (A1)			Alaska Col	or Change	e (TA4)4	Г	Alaska Gleyed Without Hue 5Y or
Histi	c Epipedon (A2)			Alaska Alp	ine Swale	s (TA5)		Redder Underlying Layer
☐ Hydi	rogen Sulfide (A4)		- 10	Alaska Red	lox With 2	.5Y Hue		Other (Explain in Remarks)
Thic	k Dark Surface (A1	2)	0					
☐ Alas	ka Gleyed (A13)		3One	Indicator of	hydrophyt	ic vegetation	, one primary indicate	or of wetland hydrology,
T Alas	ka Redox (A14)		and a	an appropriat	e landsca	pe position n	nust be present.	
Alas	ka Gleyed Pores (A	(15)	4Give	details of co	olor chang	e in Remarks	S.	
Restrictiv	e Layer (if present)	Frozen		-				100 - 100 -
a finding in your	bearing the second	Frozen					Hydric Solls Pr	resent? Yes
Depth:	14" bgs							
emarks:		5 ;					Secondary I	ndicators (2 or more required)
marks: /DROLO	DGY		fficient)_	_				ndicators (2 or more required) ained Leaves (B9)
marks: /DROLO /etland Hy rimary Indi	DGY ydrology Indicator		Surface S	Soil Cracks (E	the state of		Water St	ained Leaves (B9) e Patterns (B10)
PMARKS: ODROLO Vetland Hy rimary Indi X Surface	OGY ydrology Indicator icators (any one inc		Surface S	Goil Cracks (E	the state of	agery (B7)	Water State Drainage Salt Dep	ained Leaves (B9) e Patterns (B10) posits (C5)
OROLO Vetland Hy rimary Indi X Surfac X High V	OGY ordrology Indicator icators (any one inc ce Water (A1)		Surface S Inundation		Aerial Ima		Water State Drainage Salt Dep	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C
OROLO Vetland Hy rimary Indi X Surfac X High V	OGY ydrology Indicator icators (any one ind ce Water (A1) Nater Table (A2)		Surface S Inundation Sparsely	ns Visible on	Aerial Ima		Water State Drainage Salt Dep Oxidized Presence	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ca) to of Reduced Iron (C4)
Primary Indix Surface X High V X Satura Water Sedim	OGY vdrology indicator icators (any one indicators) ce Water (A1) Water Table (A2) ation (A3) Marks (B1) ment Deposits (B2)		Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated C n Sulfide Odd on Water Ta	Aerial Ima oncave S or (C1) ble (C2)		Water St. Drainage Salt Dep Oxidized Presend Stunted	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C
Primary Indix Surface X High V X Satura Water Sedim	OGY Idrology Indicator icators (any one inco De Water (A1) Water Table (A2) ation (A3) Marks (B1) ment Deposits (B2) Deposits (B3)	licator is su [[[[[[Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated C n Sulfide Odd	Aerial Ima oncave S or (C1) ble (C2)		Water St. Drainage Salt Dep Oxidized Presend Stunted Shallow	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Coe of Reduced Iron (C4) or Stressed Plants (D1)
POROLO Vetland Hy rimary Indi X Surface X High V X Satura Water Sedim Drift D Mat o	ogy ydrology Indicator icators (any one ince be Water (A1) Water Table (A2) ation (A3) Marks (B1) ment Deposits (B2) Deposits (B3) f Crust of Algae or	licator is su [[[[[[Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated C n Sulfide Odd on Water Ta	Aerial Ima oncave S or (C1) ble (C2)		Water Str. Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor	ained Leaves (B9) e Patterns (B10) cosits (C5) d Rhizospheres on Living Roots (Cite of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3)
POROLO Vetland Hy rimary Indi X Surface X High V X Satura Water Sedim Drift D Mat o	OGY Idrology Indicator icators (any one inco De Water (A1) Water Table (A2) ation (A3) Marks (B1) ment Deposits (B2) Deposits (B3)	licator is su [[[[[[Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated C n Sulfide Odd on Water Ta	Aerial Ima oncave S or (C1) ble (C2)		Water St. Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cite of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2)
POROLO Vetland Hy rimary Indi X Surface X High V X Satura Water Sedim Drift D Mat o	OGY Idrology Indicator icators (any one incide Water (A1) Water Table (A2) ation (A3) Marks (B1) ment Deposits (B2) Deposits (B3) f Crust of Algae or Deposits (B5)	licator is su [[[[[[Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated C n Sulfide Odd on Water Ta xplain in Rem	Aerial Ima oncave S or (C1) ble (C2) narks)		Water St. Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cite of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4)
Primarks: Proposition of the control of the contro	OGY Idrology Indicator icators (any one incide Water (A1) Water Table (A2) ation (A3) Marks (B1) ment Deposits (B2) Deposits (B3) f Crust of Algae or Deposits (B5)	licator is su [[[[[[Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated C n Sulfide Odd on Water Ta	Aerial Ima oncave S or (C1) ble (C2) narks)		Water St. Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cite of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4)
Primarks: Proposition of the control of the contro	pogy identifications (any one incident (A1) Water Table (A2) ation (A3) Marks (B1) ment Deposits (B2) Deposits (B3) f Crust of Algae or Deposits (B5) rvations: er Present?	licator is su	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated C n Sulfide Odd on Water Ta xplain in Rem	Aerial Ima oncave S or (C1) ble (C2) narks)		Water Sta	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cite of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4)
Property of the color of the co	order of Algae or Present? Protection (A3) Marks (B1) Protection (B3) For Crust of Algae or Present? Present? Present? Present?	icator is su [[[[[Marl (B4) Yes Yes Yes	Surface S Inundation Sparsely Hydroger Dry Seas Other (Ex	Depth (i	Aerial Ima oncave S or (C1) ble (C2) narks)	0 1 0	Water Standard Water	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cite of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) eutral Test (D5)
Property of the color of the co	pogy icators (any one income Water (A1) Water Table (A2) ation (A3) Marks (B1) ment Deposits (B2) Deposits (B3) f Crust of Algae or income (B5) rvations: er Present? Present?	icator is su [[[[[Marl (B4) Yes Yes Yes	Surface S Inundation Sparsely Hydroger Dry Seas Other (Ex	Depth (i	Aerial Ima oncave S or (C1) ble (C2) narks)	0 1 0	Water Standard Water	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cite of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) eutral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Applicate/Owner: Brooks Range Peti	roleum					Automor		-
Investigator(s): JBrekken, JO'Brien	Ŀ	andform (hill	side, terra	e, Huumock,	etc: Terrace	Samplin	g Point:	B-8
Local Relief (concave, convex, none):	Concave	Sle	ope (%):	1-2				
Subregion:	Lat:		Lor	ıg:	Datum:			
Are climate/hydrologic conditions on th	e site typical for this tin	ne of year? \	es					
Are Vegetation?,No Soil? No	or Hydrocabon?	No	significan	tly disturbed?	Are "Normal Ci	ircumstances" Pr	esent?	Yes
Are Vegetation?,No Soil? No	or Hydrocabon?	No	naturally	problematic?	(If needed, explain	in any answers in R	(emarks)	
SUMMARY OF FINDINGS - Attach sit	e map showing samp	ling point i	ocations,	transects, Im	portant features	, etc.		
Hydrophytic Vegetation Present?	Yes	Is the S	Sampled A	rea				
Hydric Soils Present?	Yes	within	a Wetland	Yes				
Wetland Hydrology Present?	Yes							
Remarks:								
VEGETATION (List all species	s in plot)							- 77
Tree Stratum (Use scientific names		Absolute		WILL COLD TO SERVICE STORY	Dominance Te	st worksheet:		_
1.		%Cover	Species	Status	Number of Dom That Are OBL, F		3	(A)
2.							_	_ (//
					Total Number o Species Across		3	(B)
3.					Percent of Dom	inant Species		
4.	Carr				That Are OBL, F		100	(A/B)
Sampling/Shrub Stratum	50% of total cover:	Cover: 20%	of total cove	er:	Prevalence I			
Salix reticulata		2		FAC	fact the second second	er of: Multiplied b		
2. Salix arctica		1		FAC	FACW Species		0.01	_
3.					FAC Species	35 x 3 =	105	=
1.					FACU Species	0 x4=	0	
4.					UPL Species	0 x 5 =	0	
5.					Column Totals:	116 (A)	226	(B)
6.					Description on lands	ex = B/A = 1.9		
Had Status	Total 50% of total cover:	Cover: Trea 20%	of total cove		Prevalence Inde	BX = B/A = 1.5		
Herb Stratum				100	Hydrophytic V	egetation indic	cators:	
Polygonum viviparum		1		FAC	Dominano	e Test is >50%		
2. Carex podocarpa		30	Yes	FAC	X Prevalence	e Test is≤3.0		
3. Eriophorum angustifolium		30	Yes	OBL	Morpholog	gical Adaptions' (Provide	
4. Saxifraga rivularis		1		OBL	supporting data i		the same of	25 7 3 5 6 7
5. Carex saxatilis		40	Yes	EACW	Problema	tic Hydrophytic V	egetatio	n' Explain)
6. Pedacularis verticillata		1		EAC	Indicators of h	ydric soil and we	tland hyd	drology must
7. Melandrium affine		1		NI	prodom amo	ou or p	. 22.01110	
8. Carex rariflora		10		OBL				
	Total	Cover: 117					0	
Plot size (radius, or length x width) 1	22 12 21 Co. C. 22 22 22 22 22 22 22 22 22 22 22 22 22		of total cove	or: 23.4	Hydrophytic Veg	etation Present?	5	Yes
% Cover of Wetland Bryophytes:		Bare Ground Cover of Bry		10			-	

Remarks: DP located on slightly elevated terrace adjacent to swale that connects large lake and pond to the south.

SOIL

	Color (moist)	%	Color (moist)	%	Type1	LOC2	Texture Remarks	Remarks
0-6								Organics
6-17	5 Y 3/1	100					sandy loam	Organics/soil mix
17-19	5 Y 3/1	60	5 YR 2.5/1	40	RM	М	sandy loam	Organics/soil mix
77.	=Concentrations, D=	=Deplet	200 100 100 100 100 100 100 100 100 100			2000		ot Channel, M=Matrix
	oil Indicators:		Indica	itors for Prot			183;	
X Histo	sol or Histel (A1)		F	Alaska Color	Change (TA4)4	Г	Alaska Gleyed Without Hue 5Y or
Histic	Epipedon (A2)			Alaska Alpin		APAWa		Redder Underlying Layer
Hydr	ogen Sulfide (A4)			Alaska Redo	x With 2.51	Y Hue	Г	Other (Explain in Remarks)
	Dark Surface (A12)	-2.00	- To 5 - 12-	W 2- 65			
Alasi	ka Gleyed (A13)		₃One l	Indicator of hy	drophytic	vegetation	, one primary indicat	or of wetland hydrology,
Alasi	(a Redox (A14)						nust be present.	
Alasi	a Gleyed Pores (A	15)	4Give	details of colo	r change i	n Remarks	5.	
Restrictive	Layer (if present):	Froze					Millor a cart.	00111200112000
		11020					Hydric Solls P	resent? Yes
Depth:	19" bgs							è
	200							
DROLO	GY drology Indicators	•					Secondary I	ndicators (2 or more required)
etland Hy			sufficient)				New / reasons	ndicators (2 or more required)
etland Hy rimary Indi	drology Indicators		The balance of	oil Cracks (B6)		Water St	ained Leaves (B9) e Patterns (B10)
rimary Indi	drology Indicators cators (any one indi		Surface S	oil Cracks (B6 s Visible on A		ery (B7)	Water St Drainag Salt Dep	ained Leaves (B9) e Patterns (B10) posits (C5)
rimary India Surface High V	drology Indicators cators (any one indi e Water (A1)		Surface So		erial Image		Water St Drainag Salt Dep Oxidized	rained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3
rimary India Surface High W	drology Indicators cators (any one indi e Water (A1) Vater Table (A2)		Surface Some Inundations Sparsely V	s Visible on A	erial Image ncave Surfa		Water St Drainag Salt Dep Oxidized	cained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C5) ce of Reduced Iron (C4)
etland Hy rimary India Surfac High W Satura Water	drology Indicators cators (any one indi e Water (A1) Vater Table (A2) tion (A3)		Surface Some Inundations Sparsely \ Hydrogen	s Visible on A egetated Cor	erial Image ncave Surfa (C1)		Water St Drainag Salt Dep Oxidized Presend Stunted	cained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C5) ce of Reduced Iron (C4) or Stressed Plants (D1)
rimary India Surface High W Satura Water Sedim	drology Indicators cators (any one indi- e Water (A1) Vater Table (A2) tion (A3) Marks (B1)		Surface Some Inundations Sparsely V Hydrogen Dry Seaso	s Visible on A /egetated Cor Sulfide Odor	erial Image ncave Surfa (C1) e (C2)		Water St Drainag Salt Dep Oxidizer Present Stunted Shallow	cained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C5) ce of Reduced Iron (C4)
rimary India Surface High W Satural Water Sedima	drology Indicators cators (any one indi- e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2)	cator is	Surface Some Inundations Sparsely V Hydrogen Dry Seaso Other (Exp	s Visible on A /egetated Cor Sulfide Odor on Water Table	erial Image ncave Surfa (C1) e (C2)		Water St Drainag Salt Dep Oxidizer Present Stunted Shallow Geomoi	cained Leaves (B9) the Patterns (B10) the Patterns (B10) the Stress (C5) the Reduced Iron (C4) the Patterns (C4) to r Stressed Plants (D1) the Aquitard (D3)
Vetland Hy rimary India Surface High W Satural Water Sedime Drift D Mat of	drology Indicators cators (any one indi- e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3)	cator is	Surface Some Inundations Sparsely V Hydrogen Dry Seaso Other (Exp	s Visible on A /egetated Cor Sulfide Odor on Water Table	erial Image ncave Surfa (C1) e (C2)		Water St Drainag Salt Dep Oxidized Presend Stunted Shallow Geomod Microto	cained Leaves (B9) the Patterns (B10) toosits (C5) the Rhizospheres on Living Roots (C5) the of Reduced Iron (C4) the or Stressed Plants (D1) the Aquitard (D3) the Position (D2)
Vetland Hy rimary India Surface High W Satural Water Sedime Drift D Mat of	drology Indicators cators (any one indice e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5)	cator is	Surface Some Inundations Sparsely V Hydrogen Dry Seaso Other (Exp	s Visible on A /egetated Cor Sulfide Odor on Water Table	erial Image ncave Surfa (C1) e (C2)		Water St Drainag Salt Dep Oxidized Presend Stunted Shallow Geomod Microto	rained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C5) ce of Reduced Iron (C4) or Stressed Plants (D1) or Aquitard (D3) rphic Position (D2) pographic Relief (D4)
rimary India Surface High W Satural Water Sedim Drift D Mat of	drology Indicators cators (any one indicators e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5)	cator is	Surface Some Inundations Sparsely V Hydrogen Dry Seaso Other (Exp	s Visible on A /egetated Cor Sulfide Odor on Water Table	erial Image ncave Surfi (C1) e (C2) rks)		Water St Drainag Salt Dep Oxidized Presend Stunted Shallow Geomod Microto	rained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C5) ce of Reduced Iron (C4) or Stressed Plants (D1) or Aquitard (D3) rphic Position (D2) pographic Relief (D4)
Vetland Hy rimary India Surface High W Satural Water Sedim Drift D Mat of Iron De	drology Indicators cators (any one indicators e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5) vations: r Present?	cator is	Surface Solutions Inundations Sparsely \ Hydrogen Dry Seaso Other (Exp	s Visible on A /egetated Cor Sulfide Odor on Water Table plain in Rema	erial Image ncave Surfi (C1) e (C2) rks)		Water St Drainag Salt Dep Oxidizer Presend Stunted Shallow Geomon Microtop FAC-Ne	rained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C5) ce of Reduced Iron (C4) or Stressed Plants (D1) or Aquitard (D3) rphic Position (D2) pographic Relief (D4)
rimary India Surface High W Satural Water Sedime Drift D Mat of Iron De Iron	drology Indicators cators (any one indicators e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5) vations: r Present? esent? esent? esent?	lari (B4)	Surface Some Inundations Sparsely V Hydrogen Dry Seaso Other (Exp	s Visible on Ar /egetated Cor Sulfide Odor on Water Table plain in Rema Depth (inc Depth (inc	erial Image ncave Surfi (C1) e (C2) rks)	17 0	Water St Drainag Salt Dep Oxidized Presend Stunted Shallow Geomod Microto X FAC-Ne	rained Leaves (B9) re Patterns (B10) re Patterns (B10) re Patterns (B10) re Patterns (B10) re of Reduced Iron (C4) re of Reduced Iron (C4) re Aquitard (D3) rephic Position (D2) repographic Relief (D4) reputal Test (D5)
rimary India Surface High W Satural Water Sedime Drift D Mat of Iron De Iron	drology Indicators cators (any one indicators e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5) vations: r Present?	lari (B4)	Surface Some Inundations Sparsely V Hydrogen Dry Seaso Other (Exp	s Visible on Ar /egetated Cor Sulfide Odor on Water Table plain in Rema Depth (inc Depth (inc	erial Image ncave Surfi (C1) e (C2) rks)	17 0	Water St Drainag Salt Dep Oxidized Presend Stunted Shallow Geomod Microto X FAC-Ne	rained Leaves (B9) re Patterns (B10) re Patterns (B10) re Patterns (B10) re Patterns (B10) re of Reduced Iron (C4) re of Reduced Iron (C4) re Aquitard (D3) rephic Position (D2) repographic Relief (D4) reputal Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

mer: Brooks Range Petroleum				E
s): JBrekken, JO'Brien	Landform (hill	side, terrace, Huumock,	etc: Tussocks plentiful Sampling Point:	B-9
(concave, convex, none): Flat	Sit	ope (%): 2		
A 100 A	Lat:	Long:	Datum:	
ydrologic conditions on the site typ	al for this time of year? Y	/es		
on?,No Soil? No o	lydrocabon? No	significantly disturbed?	Are "Normal Circumstances" Present?	Yes
	lydrocabon? No	naturally problematic?	(If needed, explain any answers in Remarks)	
OF FINDINGS - Attach site map s		ocations, transects, im	portant features, etc.	
Vegetation Present? Yes	Is the S	Sampled Area		
Present? Yes	within a	a Wetland? Yes		
rology Present? Yes				
ION (List all species in ple			A A A SA SA SA	
tum (Use scientific names)	Absolute		Dominance Test worksheet:	
am (occ addition names)	%Cover	Species Status	Number of Dominant Species That Are OBL, FACW, or FAC: 1	(A)
				- (-1
			Total Number of Dominant Species Across All Strata: 3	(B)
			Percent of Dominant Species That Are OBL, FACW, FAC: 33	(A/B)
thrub Stratum cov.	Total Cover:	Jan.	Prevalence Index:	
Shrub Stratum 50% of culata		of total cover:	Total % Cover of: Multiplied by:	
	3	100	OBL Species 0 x 1 = 0	-
tica	2	FAC	FACW Species 50 x 2 = 100 FAC Species 17 x 3 = 51	_
tetragona	20	Yes FACU	FAC Species 17 x 3 = 51 FACU Species 36 x 4 = 144	-
egrifolia	15	Yes FACU	UPL Species 0 x5= 0	3
			Column Totals: 103 (A) 295	— (B)
E00/ of	Total Cover: 40	of total course 9	Prevalence Index = B/A = 2.86	
um 50% of	al cover: 20 20%	of total cover: 8	Hydrophytic Vegetation Indicators:	
um bistorta	2	FAC	Dominance Test is >50%	
Ca	10	FAC	➤ Prevalence Test is ≤3.0	
um vaginatum	50	Yes FACW	Morphological Adaptions' (Provide	
macounii	1	FACU	supporting data in Remarks or on a spere	rate sheet
			Problematic Hydrophytic Vegetation	n' Explain)
			Indicators of hydric soil and wetland hydric	
			be present unless disturbed or problemic	
	Total Course 69			
		of total cover: 12.6	Hydrophytic Vegetation Present?	es
adius, or length x width) 15' radius	% Bare Ground:		A STATE OF THE STA	P. C.
	김 1811년 (대학교 등 기가기)		Hydrophytic Vegetation Present?	

Remarks: A relatively higher area (topographically) than surrounding terrain. Site dominated by Eri. vag. tussocks with fruticose lichens and Cas. tet. in between.

SOIL

Sampling Point:

B-9

0-2								Organics
2-6	10 R 2.5/1	100					sandy loam	Organics/soil mix
6-11	10 R 3/1	100					sandy loam	Organics/soil mix
Type: C	=Concentrations, D	=Depletions	s, RM=Reduc	ed Matrix.	2L00	ation: PL=P	ore Linings, RC=Roo	ot Channel, M=Matrix
Hydric Sc	oil Indicators:		Indic	ators for P	roblemati	c Hydric Soi	liso:	
X Histo	osol or Histel (A1)		Г	Alaska Co	lor Chang	e (TA4)4	Г	Alaska Gleyed Without Hue 5Y or
Histic	c Epipedon (A2)			Alaska Al	oine Swale	s (TA5)		Redder Underlying Layer
T Hydr	rogen Sulfide (A4)			Alaska Re	dox With 2	2.5Y Hue	E	Other (Explain in Remarks)
Thick	k Dark Surface (A1	2)						
T Alas	ka Gleyed (A13)		3One	Indicator of	hydrophy	tic vegetation	, one primary indicat	tor of wetland hydrology,
	ka Redox (A14)		and a	n appropria	te landsca	ape position r	must be present.	
	ka Gleyed Pores (A	A15)				e in Remark		
Restrictive	e Layer (if present)	Frozen					COC 400 - 1 - 10	
	The state of the s	Frozen					Hydric Solls P	resent? Yes
. 19/45/1-20								
Depth:	11" bgs							
Depth:		*:					Secondary	Indicators (2 or more required)
Depth: marks: /DROLO	OGY		ficient)_					Indicators (2 or more required) tained Leaves (B9)
Depth: marks: 'DROLO fetland Hy rimary Indi	OGY vdrology Indicator			Soil Cracks	(B6)		Water St	
Depth: marks: /DROLO /etland Hy rimary Indi Surface	OGY ordrology Indicator icators (any one ind		Surface S	Soil Cracks	ALTERNA	agery (B7)	Water Si Drainag Salt De	tained Leaves (B9) ge Patterns (B10) posits (C5)
Depth: marks: DROLO fetland Hy rimary Indi Surface High V	OGY odrology Indicator icators (any one index be Water (A1)		Surface S Inundation	ns Visible or	Aerial Im	agery (B7) Surface (B8)	Water Si Drainag Salt Dej Oxidize	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C
Depth: marks: DROLO fetland Hy rimary Indi Surfac High V Satura	OGY rdrology Indicator icators (any one ind be Water (A1) Water Table (A2)		Surface S Inundation Sparsely	ns Visible or	Aerial Im Concave S		Water Si Drainag Salt De Oxidize Present	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C ce of Reduced Iron (C4)
Depth: marks: DROLO fetland Hy rimary Indi Surfac High V Satura Water	OGY ordrology Indicator icators (any one indice Water (A1) Nater Table (A2) ation (A3)		Surface S Inundation Sparsely Hydrogen	ns Visible or Vegetated	Aerial Im Concave S or (C1)		Water Si Drainag Salt De Oxidize Present	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C ce of Reduced Iron (C4) d or Stressed Plants (D1)
Depth: marks: /DROLO /etland Hy rimary Indi Surface High V X Satura Water Sedim	OGY rdrology Indicator icators (any one indicators (A1) Water Table (A2) ation (A3) Marks (B1)		Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated (n Sulfide Od	Aerial Im Concave S lor (C1) able (C2)		Water St Drainag Salt Dej Oxidize Present Stunted Shallow	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3)
Depth: marks: DROLO fetland Hy rimary Indi Surfac High V Satura Water Sedim Drift D	OGY Idrology Indicator icators (any one indicators (A1) Water Table (A2) Indicators (A3) Marks (B1) Indicators (B2)	dicator is suf F F F F F	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible or Vegetated of Sulfide Od on Water T	Aerial Im Concave S lor (C1) able (C2)		Water St Drainag Salt Dej Oxidize Present Stunted Shallow Geomo	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) rphic Position (D2)
Depth: marks: /DROLO /etland Hy rimary Indi Surface High V Satura Water Sedim Drift D Mat of	OGY Indicators (any one income Water (A1) Nater Table (A2) Indicators (B1) Indicators (B2) Indicators (B2) Indicators (B2) Indicators (B2) Indicators (B2) Indicators (B3)	dicator is suf F F F F F	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible or Vegetated of Sulfide Od on Water T	Aerial Im Concave S lor (C1) able (C2)		Water St Drainag Salt Dep Oxidize Present Stunted Shallow Geomo	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3)
Depth: marks: DROLO fetland Hy rimary Indi Surface High V Satura Water Sedim Drift D Mat of	OGY rdrology Indicator icators (any one inco e Water (A1) Nater Table (A2) ation (A3) Marks (B1) ment Deposits (B2) Deposits (B3) f Crust of Algae or deposits (B5)	dicator is suf F F F F F	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible or Vegetated of Sulfide Od on Water T	Aerial Im Concave S lor (C1) able (C2)		Water St Drainag Salt Dep Oxidize Present Stunted Shallow Geomo	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) rphic Position (D2) pographic Relief (D4)
Depth: marks: DROLO rimary Indi Surfac High V Satura Water Sedim Drift D Mat of	OGY Idrology Indicator icators (any one ince we Water (A1) Nater Table (A2) ation (A3) Marks (B1) ment Deposits (B2) Deposits (B3) f Crust of Algae or deposits (B5) ryations:	dicator is suf	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated (n Sulfide Od on Water T. xplain in Re	Aerial Im Concave S lor (C1) able (C2)		Water St Drainag Salt Dep Oxidize Present Stunted Shallow Geomo	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) rphic Position (D2) pographic Relief (D4)
Depth: marks: DROLO fetland Hy rimary Indi Surface High V Satura Water Sedim Drift D Mat of Iron D	oGY rdrology Indicator icators (any one ince Water (A1) Nater Table (A2) ation (A3) Marks (B1) bent Deposits (B2) Deposits (B3) f Crust of Algae or deposits (B5) rvations:	dicator is suf	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible or Vegetated (n Sulfide Od on Water To kplain in Re	n Aerial Im Concave S for (C1) able (C2) marks)		Water St Drainag Salt Dep Oxidize Present Stunted Shallow Geomo Microto FAC-Ne	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C ce of Reduced Iron (C4) d or Stressed Plants (D1) ov Aquitard (D3) orphic Position (D2) pographic Relief (D4) eutral Test (D5)
Depth: marks: DROLO fetland Hy rimary Indi Surface High V Satura Water Sedim Drift D Mat of Iron D leid Observater face Water	OGY rdrology Indicator icators (any one income Water (A1) Nater Table (A2) ation (A3) Marks (B1) ment Deposits (B2) Deposits (B3) of Crust of Algae or Deposits (B5) rvations: ar Present? Present?	dicator is sur F F F F Mari (B4)	Surface S Inundation Sparsely Hydroger Dry Seas	vegetated (n Sulfide Od on Water To explain in Re Depth	Aerial Im Concave S lor (C1) able (C2) marks)		Water St Drainag Salt Dep Oxidize Present Stunted Shallow Geomo Microto FAC-Ne	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) rphic Position (D2) pographic Relief (D4)
Depth: marks: /DROLO /etland Hy rimary Indi — Surface — High V X Satura — Water — Sedim — Drift D — Mat of — Iron D leid Obsertace Water turation Procludes cap	OGY Identify Indicator Identify Indicators (any one indicators (A2) Identify Indicators (A2) Identify Indicators (B2) Identify Indicators (B3) Identify Indicators (B3) Identify Indicators (B4) Identify Indicators (B	Mari (B4)	Surface S Inundation Sparsely Hydroger Dry Seas Other (Ex	vegetated on Sulfide Odon Water Toxplain in Re Depth Depth Depth	Aerial Im Concave S for (C1) able (C2) marks) (inches): (inches):	Surface (B8)	Water St Drainag Salt Dep Oxidize Present Stunted Shallow Geomo Microto FAC-Ne	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C ce of Reduced Iron (C4) d or Stressed Plants (D1) ov Aquitard (D3) orphic Position (D2) pographic Relief (D4) eutral Test (D5)
Depth: marks: /DROLO /etland Hy rimary Indi — Surface — High V X Satura — Water — Sedim — Drift D — Mat of — Iron D leid Obsertace Water turation Procludes cap	OGY vdrology Indicator icators (any one indicators (any one indica	Mari (B4)	Surface S Inundation Sparsely Hydroger Dry Seas Other (Ex	vegetated on Sulfide Odon Water Toxplain in Re Depth Depth Depth	Aerial Im Concave S for (C1) able (C2) marks) (inches): (inches):	Surface (B8)	Water St Drainag Salt Dep Oxidize Present Stunted Shallow Geomo Microto FAC-Ne	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C ce of Reduced Iron (C4) d or Stressed Plants (D1) ov Aquitard (D3) orphic Position (D2) pographic Relief (D4) eutral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen	t Project Borough/Cir	ty:North Sl	ope			Sampling Date	Aug 6, 2
Applicate/Owner: Brooks Range Peti	oleum						E-ST-
Investigator(s): JBrekken, JO'Brien	La	andform (hills	side, terrace	, Huumock,	etc: see remarks	Sampling Point:	B-10
Local Relief (concave, convex, none):	Concave	Sid	ope (%): <	1			
Subregion:	Lat:		Long		Datum:		
Are climate/hydrologic conditions on th	e site typical for this tim	e of year? Y	'es				
Are Vegetation?,No Soil? No	or Hydrocabon?	No	significantly	disturbed?	Are "Normal Circum	stances" Present?	Yes
Are Vegetation?,No Soil? No	or Hydrocabon?	No	naturally pr	oblematic?	(If needed, explain any	answers in Remarks)	
SUMMARY OF FINDINGS - Attach sit	e map showing samp	ling point is	ocations, tra	ansects, im	portant features, etc.		
Hydrophytic Vegetation Present?	Yes	Is the S	Sampled Are	a			
Hydric Soils Present?	Yes	within a	a Wetland?	Yes			
Wetland Hydrology Present?	Yes						
Remarks: Flat basin - appears to be an old	d lake bed						
VEGETATION (List all species	s in plot)						
Tree Stratum (Use scientific names)		Absolute	Dominant	Indicator	Dominance Test wo	rksheet:	
1.		%Cover	Species	Status	Number of Dominant That Are OBL, FACV		(A)
2.				- 4			_ (~)
3.				- 1	Total Number of Don Species Across All S		(B)
				1	Percent of Dominant	Species	
4.	Total C	Coulor		ļ	That Are OBL, FACV		(A/B)
Sampling/Shrub Stratum	50% of total cover:		of total cover:		Prevalence Index Total % Cover of:		
Salix reticulata		2		FAC	OBL Species 40	x1 = 40	
2. Salix planifolia		1		FACW	FACW Species 22	x 2 = 44	_
3. Salix fuscescens		1		FACW	FAC Species 27	x 3 = 81	
Dryas integrifolia		4	Yes	EACU	FACU Species 7	x 4 = 28	
5. Cassiope tetragona		3	Yes	FACU	UPL Species 0 Column Totals: 96	x 5 = 0 (A) 193	(B)
6.		-			Column Totals. 96	(A) 193	⇒ ′
	Total C	Cover: 11			Prevalence Index = E	B/A = 2.01	
Herb Stratum	50% of total cover: 5.5	5 20%	of total cover:	2.2		7,733.	
Eriophorum angustifolium		40	Yes	OBL	Hydrophytic Veget		
2. Carex saxatilis		20	Yes	FACW	Dominance Tes		
3. Carex podocarpa		25	Yes	FAC		Adaptions' (Provide	
4.					supporting data in Re		
5.					Problematic Hy	drophytic Vegetatio	n' Explain)
6.					Indicators of hydric	soil and wetland hy	drology must
					be present unless dis	sturbed or problemi	<u>0.</u>
7.				- 1			-
8 .	Table	OUME DE					
	Total C 50% of total cover: 42		of total cover:	17	Hydrophytic Vegetation	n Present?	Yes
Plot size (radius, or length x width) 1		are Ground:					
% Cover of Wetland Bryophytes:	Total C	Cover of Bry	opnytes:	20			

Remarks: Dryas integrifolia and Cassiope tetragona found on micro-highs in plot

B-10

(Inches)	Color (moist)	%	Color (moist)			1 LOC2	Texture Remarks	
0-10								Predominantly organics/peat-
10-15	2.5 YR 2.5/1	100					sandy loam	Organic/soil mix
1Type: C=	=Concentrations, D)=Depletio	ns, RM=Reduc	ed Matrix.	2Loca	ation: PL=Pe	ore Linings, RC=Roo	ot Channel, M=Matrix
Hydric Sc	oli indicators:		Indic	ators for Pro	blematic	Hydric Soil	ls::	
₩ Histor	sol or Histel (A1)		Г	Alaska Colo	r Change	(TA4)4	- 0	Alaska Gleyed Without Hue 5Y or
	Epipedon (A2)		F	Alaska Alpin			21	Redder Underlying Layer
Hydro	ogen Sulfide (A4)			Alaska Redo	x With 2	.5Y Hue	F	Other (Explain in Remarks)
Thick	Dark Surface (A1	2)						
T Alask	ka Gleyed (A13)		3One	Indicator of h	ydrophyti	ic vegetation	, one primary indicat	tor of wetland hydrology,
T Alask	ka Redox (A14)						nust be present.	
Alask	ka Gleyed Pores (A	A15)	4Give	details of cold	or change	e in Remarks	S.	
Restrictive	e Layer (if present)	Frozen					Middle Solle D	resent? Yes
							Hydric Soils P	resentr
D-47.	549 2							
marks:	15" bgs							·
marks: /DROLO /etland Hyd	IGY drology indicator							Indicators (2 or more required)
marks: DROLO Tetland Hydrimary Indic	GY drology indicator cators (any one ind						Water St	tained Leaves (B9)
marks: DROLO etiand Hydrimary Indic	GY drology indicator cators (any one ind e Water (A1)		Surface S	Soil Cracks (Be	A comment	(D7)	Water Si	tained Leaves (B9) te Patterns (B10)
marks: OROLO Tetland Hydrimary Indicate Surface High W	GY drology indicator cators (any one ind e Water (A1) Vater Table (A2)		Surface S	ns Visible on A	erial Ima		Water Si Drainag Salt De	tained Leaves (B9)
TOROLO Vetland Hydrimary India Surface High W Saturat	GY drology Indicator cators (any one inde Water (A1) Vater Table (A2) tion (A3)		Surface S Inundation Sparsely	ns Visible on A Vegetated Co	erial Ima		Water Si Drainag Salt De Oxidize	tained Leaves (B9) ne Patterns (B10) posits (C5)
marks: DROLO Vetland Hydrimary India Surface High W Saturat Water	GY drology indicator cators (any one indicators e Water (A1) Vater Table (A2) tion (A3) Marks (B1)		Surface S Inundation Sparsely Hydroger	ns Visible on A Vegetated Co n Sulfide Odor	erial Ima ncave Si (C1)		Water Si Drainag Salt De Oxidize Present Stunted	tained Leaves (B9) te Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3 ce of Reduced Iron (C4) for Stressed Plants (D1)
marks: OROLO letland Hydrimary Indic Surface High W Saturat Water Sedime	drology indicator cators (any one inc e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2)		Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on A Vegetated Co n Sulfide Odor son Water Tabl	ncave Su (C1) le (C2)		Water Si Drainag Salt De Oxidize Present Stunted Shallow	tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C5) the of Reduced Iron (C4) for Stressed Plants (D1) or Aquitard (D3)
marks: /DROLO /etland Hydrimary Indic / Surface / High W / Saturat / Water / Sedime	GY drology indicator cators (any one indicators e Water (A1) Vater Table (A2) tion (A3) Marks (B1)	dicator is s	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on A Vegetated Co n Sulfide Odor	ncave Su (C1) le (C2)		Water Si Drainag Salt Dej Oxidize Present Stunted Shallow Geomo	tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C5) the of Reduced Iron (C4) for Stressed Plants (D1) of Aquitard (D3) rphic Position (D2)
Marks: //DROLO /etland Hydrimary India Surface K High W K Saturat Water Sedime Drift Do	drology indicator cators (any one inc e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2)	dicator is s	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on A Vegetated Co n Sulfide Odor son Water Tabl	ncave Su (C1) le (C2)		Water Si Drainag Salt De Oxidize Present Stunted Shallow Geomo	tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C5) the of Reduced Iron (C4) for Stressed Plants (D1) or Aquitard (D3)
Marks: //DROLO /etland Hydrimary India Surface K High W K Saturat Water Sedime Drift Do	drology indicator cators (any one inc e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5)	dicator is s	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on A Vegetated Co n Sulfide Odor son Water Tabl xplain in Rema	nerial Ima ncave Si (C1) le (C2) arks)		Water Si Drainag Salt De Oxidize Present Stunted Shallow Geomo	tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) to of Reduced Iron (C4) for Stressed Plants (D1) of Aquitard (D3) rphic Position (D2) pographic Relief (D4)
marks: TOROLO Tetland Hydrimary Indic Surface High W Saturat Water Sedime Drift De Mat of	drology indicator cators (any one inc e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5)	dicator is s	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on A Vegetated Co n Sulfide Odor son Water Tabl	nerial Ima ncave Si (C1) le (C2) arks)		Water Si Drainag Salt De Oxidize Present Stunted Shallow Geomo	tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) to of Reduced Iron (C4) for Stressed Plants (D1) of Aquitard (D3) rphic Position (D2) pographic Relief (D4)
Marks: POROLO Vetland Hydrimary Indic Surface High W Saturat Water Sedime Drift De Mat of Iron De	drology indicator cators (any one inc e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5)	Marl (B4)	Surface S Inundation Sparsely Hydroger Dry Seas Other (Ex	ns Visible on A Vegetated Co n Sulfide Odor son Water Tabl xplain in Rema	verial Ima ncave Si (C1) de (C2) arks) ches):		Water Si Drainag Salt De Oxidize Present Stunted Shallow Geomo Microto FAC-Ne	tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) to of Reduced Iron (C4) for Stressed Plants (D1) of Aquitard (D3) rphic Position (D2) pographic Relief (D4)
marks: PROLO Vetland Hydrimary Indicate Surface High W Saturat Water Sedime Drift Do Mat of Iron De Veter Table P	drology indicator cators (any one ince Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations: r Present?	Marl (B4)	Surface S Inundation Sparsely Hydroger Dry Seas Other (Ex	ns Visible on A Vegetated Co n Sulfide Odor son Water Tabl xplain in Rema	verial Ima ncave Si (C1) de (C2) arks) ches):	urface (B8)	Water Si Drainag Salt De Oxidize Present Stunted Shallow Geomo Microto FAC-Ne	tained Leaves (B9) te Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C5) to of Reduced Iron (C4) for Stressed Plants (D1) for Aquitard (D3) rphic Position (D2) pographic Relief (D4) eutral Test (D5)
Marks: //DROLO /etland Hydrimary India Surface K High W K Saturat Water Sedime Drift Do Mat of Iron De Mat of Iron De Mater Table P Mater Table P Mater Table P Mater Table P	drology indicator cators (any one index water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations: r Present? esent?	Marl (B4)	Surface S Inundation Sparsely Hydroger Dry Seas Other (Ex	ns Visible on A Vegetated Co n Sulfide Odor son Water Tabl xplain in Rema Depth (inc.) Depth (inc.)	ncave St (C1) (C1) (de (C2) arks) ches): ches):	12 0	Water Si Drainag Salt De Oxidize Present Stunted Shallow Geomo X Microto FAC-No	tained Leaves (B9) te Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C5) to of Reduced Iron (C4) for Stressed Plants (D1) for Aquitard (D3) rphic Position (D2) pographic Relief (D4) eutral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen Applicate/Owner: Brooks Range Peti		11000000	7.5			Sampling	Date	Aug 6,
Investigator(s): JBrekken, JO'Brien		. 14 0.00		The state of the	· con romarke	Sampling	Point:	B-11
Local Relief (concave, convex, none):	Concave	ACCOUNT ON	ope (%): <	, Huumock, e	etc: see remarks			0
Subregion:	Lat:	310	Long		Datum:			
(X) XX			-	4	Datum.			
Are climate/hydrologic conditions on the	e site typical for this tim	e or year?						
Are Vegetation?,No Soil? No	or Hydrocabon?	No		disturbed?	Are "Normal Circu			Yes
Are Vegetation?,No Soil? No	or Hydrocabon?	No	naturally pr	oblematic?	(If needed, explain a	ny answers in Re	marks)	
SUMMARY OF FINDINGS - Attach sit	e map showing samp	ling point le	ocations, tr	insects, Imp	ortant features, et	tc.		
Hydrophytic Vegetation Present?	Yes		Sampled Are Wetland?	Yes				
Hydric Soils Present?	Yes	with the	vectarior	100				
Wetland Hydrology Present?	Yes							
Remarks: Landform: unpatterned troughs	and scattered frost boils pr	resent						
/EGETATION (List all species	s in plot)							
Tree Stratum (Use scientific names)		Absolute	Dominant	Indicator	Dominance Test v	worksheet		
1.		%Cover	Species	Status	Number of Domina That Are OBL, FAC		3	(A)
2.								- 1/-1
					Total Number of De Species Across All	School Control	4	(B)
3.				1	Percent of Domina	nt Species		
4.	50.00	land a			That Are OBL, FAC		75	(A/B)
Sampling/Shrub Stratum	Total (of total cover:		Prevalence Ind			
Salix reticulata	30.00, 000 2000.	3	or total paror.	EAC	Total % Cover o			
2. Salix arctica		3		FAC	OBL Species 40 FACW Species 25		50	-
			V	277	FAC Species 8	x ₃ =	24	_
Dryas integrifolia		20	Yes	FACU	FACU Species 20		80	-
4.					UPL Species 0	x 5 =	0	
5.					Column Totals: 93	(A)	194	(B)
6.					200			
	Total 0		of total cover:	5.2	Prevalence Index =	= B/A = 2.09	_	
Herb Stratum	50% of total cover.	20%	or total cover.	5.2	Hydrophytic Veg	etation indica	tors:	
Eriophorum angustifolium		15	Yes	OBL	▼ Dominance T			
2. Carex saxatilis		25	Yes	FACW	▼ Prevalence T			
3. Carex aquatilis		25	Yes	OBL	The state of the state of	Adaptions' (P	rovide	
4. Saxifraga oppositifolia		2		FAC	supporting data in F	Remarks or on a	spere	rate sheet)
5.					Problematic I	Hydrophytic Ve	getation	' Explain)
					'Indicators of hydro			
6.					be present unless	disturbed or pro	oblemic	
Z.								
8.	2.1							
Plot size (radius, or length x width) 1	Total 0 50% of total cover: 33 5' radius % B		of total cover:	13.4	Hydrophytic Vegeta	tion Present?	Y	es

Remarks: Dryas integrifolia and lichens (fruticose and crustose) located on micro-highs (frost boils) and Carex aquatilis located in troughs.

0-12								Organics/peat-like
12-20	2.5 Y 3/1	100					loamy sand	Organic/soil mix w/ small gray
1Type: C=	Concentrations, D=	Depletions,	RM=Reduc	ed Matrix.	2L00	cation: PL=Po	ore Linings, RC=Roo	ot Channel, M=Matrix
Hydric So	il Indicators:		Indic	ators for P	roblemati	c Hydric Sol	ls:	
X Histor	sol or Histel (A1)		Г	Alaska C	olor Chang	e (TA4)4	15	Alaska Gleyed Without Hue 5Y or
Histic	Epipedon (A2)		F	Alaska Al	pine Swale	s (TA5)		Redder Underlying Layer
Hydro	ogen Sulfide (A4)			Alaska Re	edox With 2	2.5Y Hue	П	Other (Explain in Remarks)
Thick	Dark Surface (A12))						
T Alask	a Gleyed (A13)		₃One	Indicator o	f hydrophy	tic vegetation	, one primary indicat	or of wetland hydrology,
T Alask	a Redox (A14)		and a	an appropri	ate landsca	ape position n	nust be present.	
☐ Alask	a Gleyed Pores (A1	15)	4Give	details of	color chang	ge in Remarks	S.	
Restrictive	Layer (if present):	Frozen					Optional sha	
		FIOZOII					Hydric Solls P	resent? Yes
emarks:	20" bgs				-,-			
emarks:					,		Secondary I	ndicators (2 or more required)
emarks: YDROLO Vetland Hydrimary Indic	GY drology Indicators: cators (any one indic						Water St	tained Leaves (B9)
emarks: YDROLO Vetland Hydrimary India	GY drology Indicators: cators (any one indic a Water (A1)		Surface S	Soil Cracks			Water St	ained Leaves (B9) e Patterns (B10)
POROLO Vetland Hydrimary Indic Surface High W	GY drology Indicators: cators (any one indic e Water (A1) /ater Table (A2)		Surface S Inundation	ns Visible o	n Aerial Im		Water St Drainag Salt De	tained Leaves (B9) te Patterns (B10) posits (C5)
POROLO Vetland Hydrimary Indic Surface High W	GY drology Indicators: cators (any one indic e Water (A1) /ater Table (A2) ition (A3)		Surface S Inundation Sparsely	ns Visible o Vegetated	n Aerial Im Concave S	agery (B7) Surface (B8)	Water St Drainag Salt Dej Oxidize	lained Leaves (B9) ne Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C
Primary Indic Surface High W	GY drology Indicators: cators (any one indicators) a Water (A1) /ater Table (A2) dion (A3) Marks (B1)		Surface S Inundation Sparsely Hydrogen	ns Visible o Vegetated n Sulfide Od	n Aerial Im Concave S dor (C1)		Water St Drainag Salt Dep Oxidized	tained Leaves (B9) te Patterns (B10) posits (C5)
Primary Indicated Wetland Hydroximary Indicated Water Water	GY drology Indicators: cators (any one indicators (any one indicators) a Water (A1) //ater Table (A2) cion (A3) Marks (B1) ent Deposits (B2)		Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible o Vegetated n Sulfide Oc on Water T	n Aerial Im Concave S dor (C1) able (C2)		Water St Drainag Salt De Oxidize Presence Stunted	tained Leaves (B9) the Patterns (B10) the Patterns (B10) the Patterns (C5) d Rhizospheres on Living Roots (C6) the of Reduced Iron (C4)
POROLO Vetland Hydrimary Indic X Surface X High W X Satural Water Sedime	GY drology Indicators: cators (any one indicators) a Water (A1) /ater Table (A2) ction (A3) Marks (B1) ent Deposits (B2) eposits (B3)	cator is suffi	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible o Vegetated n Sulfide Od	n Aerial Im Concave S dor (C1) able (C2)		Water St Drainag Salt Dep Oxidize Present Stunted Shallow	tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cite of Reduced Iron (C4) to r Stressed Plants (D1)
POROLO Vetland Hydrimary India Surface High W Saturat Water Sedime Drift De	GY drology Indicators: cators (any one indice a Water (A1) /ater Table (A2) dion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or M	cator is suffi	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible o Vegetated n Sulfide Oc on Water T	n Aerial Im Concave S dor (C1) able (C2)		Water St Drainag Salt Dep Oxidized Presend Stunted Shallow Geomo	tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cite of Reduced Iron (C4) for Stressed Plants (D1) of Aquitard (D3) rphic Position (D2) pographic Relief (D4)
POROLO Vetland Hydrimary India Surface High W Saturat Water Sedime Drift De	GY drology Indicators: cators (any one indicators) a Water (A1) /ater Table (A2) ction (A3) Marks (B1) ent Deposits (B2) eposits (B3)	cator is suffi	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible o Vegetated n Sulfide Oc on Water T	n Aerial Im Concave S dor (C1) able (C2)		Water St Drainag Salt Dep Oxidized Presend Stunted Shallow Geomo	tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cite of Reduced Iron (C4) for Stressed Plants (D1) of Aquitard (D3) rphic Position (D2)
POROLO Vetland Hydrimary India Surface High W Saturat Water Sedime Drift De	GY drology Indicators: cators (any one indicators) a Water (A1) /ater Table (A2) ction (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Mapposits (B5)	cator is suffi	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible o Vegetated n Sulfide Oc on Water T	n Aerial Im Concave S dor (C1) able (C2)		Water St Drainag Salt Dep Oxidized Presend Stunted Shallow Geomo	tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cite of Reduced Iron (C4) for Stressed Plants (D1) of Aquitard (D3) rphic Position (D2) pographic Relief (D4)
POROLO Vetland Hydrimary Indic X Surface X High W X Satural Water Sedime Drift De Mat of	GY drology Indicators: cators (any one indicators) a Water (A1) /ater Table (A2) ction (A3) Marks (B1) cent Deposits (B2) eposits (B3) Crust of Algae or Metaposits (B5) vations:	cator is suffi	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible o Vegetated n Sulfide Oc on Water T xplain in Re	n Aerial Im Concave S dor (C1) able (C2)		Water St Drainag Salt Dep Oxidized Presend Stunted Shallow Geomo	tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cite of Reduced Iron (C4) for Stressed Plants (D1) of Aquitard (D3) rphic Position (D2) pographic Relief (D4)
POROLO Vetland Hydrimary Indic Surface High W Satural Water Sedime Drift De Mat of Iron De	GY drology Indicators: cators (any one indicators (any one indicators) a Water (A1) //ater Table (A2) ction (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Materials (B5) vations: r Present?	cator is suffi	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible o Vegetated in Sulfide Oc on Water T xplain in Re	n Aerial Im Concave S dor (C1) Table (C2) emarks)		Water St Drainag Salt Dep Oxidizer Presend Stunted Shallow Geomo Microto FAC-Ne	tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Cite of Reduced Iron (C4) for Stressed Plants (D1) of Aquitard (D3) rphic Position (D2) pographic Relief (D4)
emarks: YDROLO Vetland Hydrimary Indic X Surface X High W X Saturat Water Sedime Drift De Mat of Iron De Iron De Iron De ater Table P	GY drology Indicators: cators (any one indicators) a Water (A1) //ater Table (A2) cion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5) vations: Present?	cator is suffi	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible o Vegetated in Sulfide Oc on Water T explain in Re Depth	n Aerial Im Concave S dor (C1) Table (C2) emarks)		Water St Drainag Salt Dep Oxidizer Presend Stunted Shallow Geomo Microto FAC-Ne	tained Leaves (B9) te Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) for Stressed Plants (D1) Aquitard (D3) rphic Position (D2) pographic Relief (D4) eutral Test (D5)
emarks: POROLO Vetland Hydrimary Indic Surface High W Saturat Water Sedime Drift De Mat of Iron De Iteld Observator Table Politudes capi	GY drology Indicators: cators (any one indicators (any one indicators) a Water (A1) dater Table (A2) clion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5) vations: Present?	res Yes	Surface S Inundation Sparsely Hydroger Dry Seas Other (Ex	ns Visible o Vegetated in Sulfide Octon Water T explain in Re Depth Depth Depth	n Aerial Im Concave S dor (C1) Table (C2) emarks) (inches): (inches):	0 0 0	Water St Drainag Salt Dep Oxidizer Present Stunted Shallow Geomot Microto FAC-Ne Wetland Hyd	tained Leaves (B9) te Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) for Stressed Plants (D1) Aquitard (D3) rphic Position (D2) pographic Relief (D4) eutral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developme	nt Project Borough/City	North SI	ope			Sampling Da	ate Aug 6, 20
Applicate/Owner: Brooks Range Pet	troleum					0	D 40
Investigator(s): JBrekken, JO'Brien	Lan	dform (hills	side, terrace	Huumock, et	te: hummocks	Sampling Po	oint: B-12
Local Relief (concave, convex, none):	Flat	Sid	ope (%): <	1			
Subregion:	Lat:		Long:		Datum:		
Are climate/hydrologic conditions on the	he site typical for this time	of year? Y	'es				
Are Vegetation?,No Soil? No	or Hydrocabon?	No	significantly	disturbed?	Are "Normal Circui	mstances" Preser	nt? Yes
Are Vegetation?, No Soil? No	or Hydrocabon?	No	naturally pr	oblematic?	(If needed, explain an	y answers in Rema	rks)
SUMMARY OF FINDINGS - Attach s	ite map showing sampli	ng point le	ocations, tra	ansects, imp	ortant features, et	c.	
Hydrophytic Vegetation Present?	Yes		Sampled Are				
Hydric Soils Present?	Yes	within a	a Wetland?	Yes			
Wetland Hydrology Present?	Yes						
Remarks:							
EGETATION (List all specie	es in plot)						
Tree Stratum (Use scientific names	s)	Absolute %Cover	Dominant Species	Statue	Dominance Test w		
1.		Moure	220022	1.100	Number of Domina: That Are OBL, FAC		(A)
2.					Total Number of Do		
3.				é	Species Across All	Strata: 4	(B)
4.					Percent of Dominar		(A/B)
	Total Co	ver:		-	Prevalence Inde	74.44.7	(AVB)
Sampling/Shrub Stratum	50% of total cover:	20%	of total cover:		_Total % Cover of		
Salix reticulata		5		FAC	OBL Species 42	x 1 = 42	
2. Salix planifolia		10	Yes		FACW Species 41	x 2 = 82	
3. Salix rotundifolia		2		DAT	FAC Species 16	x 3 = 48	
4. Dryas integrifolia		15	Yes	FACU	FACU Species 15 UPL Species 0	x4 = 60 x5 = 0	
5.					Column Totals: 11		2 (B)
6.					_		
	Total Co	1-11		- P	Prevalence Index =	B/A = 2.04	
Herb Stratum	50% of total cover: 16	20%	of total cover:	6.4	Uvdanbuda Van	tetler ledleste	
Eriophorum angustifolium		35	Yes	OBL	Hydrophytic Vege Dominance T		rs:
2. Carex saxatilis		25	Yes	FACW	▼ Prevalence T		
3. Carex podocarpa		10		FAC		Adaptions' (Prov	ride
4. Polygonum viviparum		1		FAC S	upporting data in R		Mark To Street Art St. 1
5. Pedicularis sudetica		1		FACW	Problematic F	lydrophytic Vege	tation' Explain)
6. Eriophorum yaqinatum		5		FACIAL	' Indicators of hydri		
7. Carex vaginata		2		OBL	be present unless o	naturned of blobi	emic.
8. Carex aquatilis		5		OBL			
M SHIPA MAKRINIS	Total Co	ver. 84		200			
	50% of total cover: 42	20%	of total cover:	16.8	lydrophytic Vegetal	tion Present?	Yes
Plot size (radius, or length x width)		e Ground:					
% Cover of Wetland Bryophytes:	i otal Co	over of Bry	upriyles:	15			

Remarks: Some fruticose lichens present on micro-highs.

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-	u	ч	L	

8-20 2.5 Y 4/1 100 loamy sand Organic/soil mix 1Type: C=Concentrations, D=Depletions, RM=Reduced Matrix. slocation: PL=Pore Linings, RC=Root Channel, M=Matrix Hydric Soil Indicators: Indicators for Problematic Hydric Soilss: Histosol or Histel (A1)	(inches)	Color (moist)						Texture Remarks	A
iType: C=Concentrations, D=Depletions, RM=Reduced Matrix.	0-8					-			Organics
Hydric Soil Indicators: Indicators for Problematic Hydric Soilss: Histosoi or Histel (A1)	8-20	2.5 Y 4/1	100					loamy sand	Organic/soil mix
Hydric Soil indicators: Indicators for Problematic Hydric Soilss: Histosol or Histel (A1)									2007 WI 20 20 20 20 20 20 20 20 20 20 20 20 20
Histosoi or Histel (A1)			D=Depletio						ot Channel, M=Matrix
Histic Epipedon (A2)				indic				83.	Carrie de la villa de la Colo
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Sediment Deposits (B2)	POROLO Petland Hydrimary Indic	GY drology Indicator ators (any one ind Water (A1) ater Table (A2)		Surface S	ns Visible	on Aerial Im		Water Si Drainag Salt De Oxidize	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	POROLO Vetland Hydrimary Indic Surface Water I Sedime Drift De Mat of Iron De	GY Irology Indicators ators (any one ince Water (A1) Inter Table (A2) Iron (A3) Marks (B1) Int Deposits (B2) Iron (B3) Crust of Algae or Iron (B5) Iron (B5) Iron (B5) Iron (B7) Iron (B7	Mari (B4)	Surface S Inundation Sparsely Hydrogen Dry Seas Other (E.	vegetated Sulfide Con Water Explain in R	on Aerial Im I Concave S Odor (C1) Table (C2) emarks)	Gurface (B8)	Water Si Drainag Salt De Oxidize Present Stunted Shallow Geomo Microto	tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) propric Position (D2) prographic Relief (D4) eutral Test (D5)
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WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen	t Project Borough/Cit	ty:North SI	ope		Sampling Date	Aug 6, 20
Applicate/Owner: Brooks Range Petr	oleum				0	B-13
Investigator(s): JBrekken, JO'Brien	La	andform (hill:	side, terrace	Huumock,	etc: troughs and tusso	B-13
Local Relief (concave, convex, none):	Flat	Slo	ope (%): <	1		
Subregion:	Lat:		Long		Datum:	
Are climate/hydrologic conditions on the	site typical for this tim	e of year? Y	'es			
Are Vegetation?,No Soil? No	or Hydrocabon?	No	significantly	disturbed?	Are "Normal Circumstances" Present?	Yes
Are Vegetation?, No Soil? No	or Hydrocabon?	No	naturally pr	oblematic?	(If needed, explain any answers in Remarks)	
SUMMARY OF FINDINGS - Attach sit	e map showing samp	ling point is	ocations, tra	ansects, Imp	portant features, etc.	
Hydrophytic Vegetation Present?	Yes	Is the S	Sampled Are	а	77534434443747	
Hydric Soils Present?	Yes	within	a Wetland?	Yes		
Wetland Hydrology Present?	Yes					
Remarks: Unpatterned troughs and tussoo	ks present					
VEGETATION (List all species	in plot)					
		Absolute		Indicator	Dominance Test worksheet:	
Tree Stratum (Use scientific names) 1.		%Cover	Species	Status	Number of Dominant Species That Are OBL, FACW, or FAC: 3	761
1.					-	(A)
2.					Total Number of Dominant Species Across All Strata: 5	(B)
3.					Percent of Dominant Species	
4.				- 1	That Are OBL, FACW, FAC: 60	(A/B)
Sampling/Shrub Stratum	Total (of total cover:		Prevalence Index:	
Salix reticulata	do no on talka obron.	5	or total covor.	FAC	Total % Cover of: Multiplied by:	
2. Salix planifolia		10	Yes	FACW	OBL Species 35 x 1 = 35 FACW Species 35 x 2 = 70	_
		2	138	EAC	FAC Species 9 x 3 = 27	
			14.		FACU Species 25 x 4 = 100	_
4. Dryas integrifolia		15	Yes	FACU	UPL Species 0 x 5 = 0	
5. Cassiope tetragona		10	Yes	FACU	Column Totals: 104 (A) 232	(B)
6.	120.0				Prevalence Index = B/A = 2.23	
Llock Streetum	Total 0		of total cover:	8.4	Prevalence Index - D/A - 2.20	
Herb Stratum					Hydrophytic Vegetation Indicators:	
Eriophorum angustifolium		10		OBL	▼ Dominance Test is >50%	
2. Carex saxatilis		25	Yes	FACW	Prevalence Test is ≤3.0	
Saussurea angustifolia		2		FAC	Morphological Adaptions' (Provide	
4. Juncus arcticus		25	Yes	OBL	supporting data in Remarks or on a spere	
5.					Problematic Hydrophytic Vegetation	n' Explain)
6.					'Indicators of hydric soil and wetland hy be present unless disturbed or problemic	
Z.					E. S.	
8.						
	Total (Cover: 62				
Plot size (radius, or length x width) 15	50% of total cover: 31 5' radius % B	1 20% are Ground		12.4	Hydrophytic Vegetation Present?	Yes
% Cover of Wetland Bryophytes:	Total (Cover of Bry	ophytes:	5		

Remarks: Dryas integrifolia located on micro-highs. Little to no lichens present.

Sampling Point:

0-3								Organics
3-4	2.5 YR 4/6	100					loam	Organic/soil mix
4-17	2.5 Y 4/1	- 1739					loamy sand	Organic/soil mix
- C. C. C.		100				-	- Table 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10	
17-20	2.5 Y 3/1	100					loamy sand	Organic/soil mix
¹Type: C	=Concentrations,	D=Depletic	ons, RM=Reduc	ed Matrix.	2Loca	ation: PL=P	ore Linings, RC=Roo	ot Channel, M=Matrix
Hydric S	oli indicators:		Indic	ators for Pr	oblematic	Hydric Sol	lsa:	
X Histo	osol or Histel (A1)			Alaska Col	or Change	e (TA4)4		Alaska Gleyed Without Hue 5Y or
Histic	c Epipedon (A2)		- E	Alaska Alp	ine Swales	s (TA5)		Redder Underlying Layer
Hydr	rogen Sulfide (A4)			Alaska Red	lox With 2	.5Y Hue	10	Other (Explain in Remarks)
Thick	k Dark Surface (A	12)						
Alas	ka Gleyed (A13)		3One	Indicator of	hydrophyt	ic vegetation	, one primary indicat	tor of wetland hydrology,
☐ Alas	ka Redox (A14)		and a	an appropriat	e landsca	pe position n	nust be present.	
Alas	ka Gleyed Pores (A15)	4Give	details of co	lor change	e in Remark	S.,	
Restrictive	e Layer (if present): Frozen					110-71-07	
		FIOZOII	1				Hydric Solls P	resent? Yes
Depth:	20" bgs							-
marks:	NOV.			'orang	e' layer at	t base of org	anics layer (~3" bgs)	
DROLC	OGY odrology Indicato	rs;		'orang	e' layer at	t base of org		ndicators (2 or more required)
DROLC	A TABLE OF THE PARTY OF THE PAR		ufficient)	'orang	e' layer at	t base of org	Secondary I	
DROLO letland Hy	drology Indicato			'orang		t base of org	Secondary	indicators (2 or more required)
DROLO /etland Hy rimary Indi Surface	drology Indicato icators (any one in		Surface S		36)		Secondary	indicators (2 or more required) tained Leaves (B9) te Patterns (B10) posits (C5)
POROLO Vetland Hy rimary Indi Surface High V	drology Indicato icators (any one in ce Water (A1)		Surface S	Soil Cracks (I	36) Aerial Ima	agery (B7)	Secondary Water St Drainag Salt De Oxidize	ndicators (2 or more required) tained Leaves (B9) te Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3
/DROLO /etland Hy rimary Indi — Surfac — High V ▼ Satura	drology Indicato icators (any one in ce Water (A1) Water Table (A2)		Surface S Inundation Sparsely	Soil Cracks (I	36) Aerial Ima oncave Si	agery (B7)	Secondary I Water Si Drainag Salt De Oxidize Present	indicators (2 or more required) tained Leaves (B9) te Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) te of Reduced Iron (C4)
PROLO Fetland Hy rimary Indi Surface High V Satura Water	rdrology Indicatoricators (any one in the Water (A1) Water Table (A2) Intion (A3)	dicator is s	Surface S Inundation Sparsely Hydroger	Soil Cracks (I ns Visible on Vegetated C	36) Aerial Ima oncave Si or (C1)	agery (B7)	Secondary Water St Drainag Salt De Oxidize Present Stunted	ndicators (2 or more required) tained Leaves (B9) te Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3 ce of Reduced Iron (C4) or Stressed Plants (D1)
/DROLC /etland Hy rimary Indi — Surfac — High V ✓ Satura — Water — Sedim	rdrology Indicatoricators (any one in the Water (A1) Water Table (A2) Intion (A3)	dicator is s	Surface S Inundation Sparsely Hydroger Dry Seas	Soil Cracks (I ns Visible on Vegetated C n Sulfide Odo	36) Aerial Ima oncave Si or (C1) ble (C2)	agery (B7)	Secondary Water St Drainag Salt De Oxidize Present Stunted Shallow	ndicators (2 or more required) tained Leaves (B9) te Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3 te of Reduced Iron (C4) or Stressed Plants (D1) or Aquitard (D3)
/DROLC /etland Hy rimary Indi — Surfac High V Satura — Water — Sedim — Drift D	rdrology Indicator icators (any one in the Water (A1) Water Table (A2) ation (A3) Marks (B1) ment Deposits (B2)	dicator is s	Surface S Inundation Sparsely Hydroger Dry Seas	Soil Cracks (I ns Visible on Vegetated C n Sulfide Odd on Water Ta	36) Aerial Ima oncave Si or (C1) ble (C2)	agery (B7)	Secondary Water St Drainag Salt De Oxidize Present Stunted Shallow Geomo	ndicators (2 or more required) tained Leaves (B9) te Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3 ce of Reduced Iron (C4) or Stressed Plants (D1)
PROLO Fetland Hy rimary Indi Surface High V Satura Water Sedim Drift D Mat of	rdrology Indicatoricators (any one ince Water (A1) Nater Table (A2) ation (A3) Marks (B1) ment Deposits (B2) Deposits (B3)	dicator is s	Surface S Inundation Sparsely Hydroger Dry Seas	Soil Cracks (I ns Visible on Vegetated C n Sulfide Odd on Water Ta	36) Aerial Ima oncave Si or (C1) ble (C2)	agery (B7)	Secondary Water St Drainag Salt Dej Oxidize Present Stunted Shallow Geomo	ndicators (2 or more required) tained Leaves (B9) te Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3 te of Reduced Iron (C4) I or Stressed Plants (D1) or Aquitard (D3) rphic Position (D2)
PROLO Fetland Hy rimary Indi Surface High V Satura Water Sedim Drift D Mat of	rdrology Indicatoricators (any one ince Water (A1) Nater Table (A2) Intion (A3) Marks (B1) Inent Deposits (B2) Deposits (B3) If Crust of Algae or deposits (B5)	dicator is s	Surface S Inundation Sparsely Hydroger Dry Seas	Soil Cracks (I ns Visible on Vegetated C n Sulfide Odd on Water Ta	36) Aerial Ima oncave Si or (C1) ble (C2)	agery (B7)	Secondary Water St Drainag Salt Dej Oxidize Present Stunted Shallow Geomo Microto	ndicators (2 or more required) tained Leaves (B9) te Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) te of Reduced Iron (C4) or Stressed Plants (D1) or Aquitard (D3) rphic Position (D2) pographic Relief (D4)
PROLC Fetland Hy rimary Indi Surface High V Satura Water Sedim Drift D Mat of Iron D	rdrology Indicatoricators (any one ince Water (A1) Nater Table (A2) Intion (A3) Marks (B1) Inent Deposits (B2) Deposits (B3) If Crust of Algae or deposits (B5)	dicator is s	Surface S Inundation Sparsely Hydroger Dry Seas Other (Ex	Soil Cracks (I ns Visible on Vegetated C n Sulfide Odd on Water Ta	Aerial Ima oncave Si or (C1) ble (C2) narks)	agery (B7)	Secondary Water St Drainag Salt Dej Oxidize Present Stunted Shallow Geomo Microto	ndicators (2 or more required) tained Leaves (B9) te Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) te of Reduced Iron (C4) or Stressed Plants (D1) or Aquitard (D3) rphic Position (D2) pographic Relief (D4)
PROLC Fetland Hy rimary Indi Surface High V Satura Water Sedim Drift D Mat of Iron D	rdrology Indicators (any one in the Water (A1) Water Table (A2) Indicators (B1) Indicators (B1) Indicators (B2) Indicators (B3) Indicators (B3) Indicators (B3) Indicators (B5) Indicators (B5	Marl (B4)	Surface S Inundation Sparsely Hydroger Dry Seas Other (E)	Soil Cracks (I ns Visible on Vegetated Co n Sulfide Odd on Water Ta kplain in Ren Depth (i	Aerial Ima oncave Si or (C1) ble (C2) narks)	agery (B7)	Secondary Water St Drainag Salt De Oxidize Present Stunted Shallow Geomo Microto FAC-Ne	ndicators (2 or more required) tained Leaves (B9) te Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) te of Reduced Iron (C4) or Stressed Plants (D1) or Aquitard (D3) rphic Position (D2) pographic Relief (D4)
PROLO Fetland Hy rimary Indi Surface High V Satura Water Sedim Drift D Mat of Iron D Feld Obsert face Water ter Table If turation Procludes cap	rdrology Indicator icators (any one in the Water (A1) Nater Table (A2) ation (A3) Marks (B1) thent Deposits (B2) Deposits (B3) of Crust of Algae or theposits (B5) rvations: or Present? Present? The property of the propert	Mari (B4)	Surface S Inundation Sparsely Hydroger Dry Seas Other (Ex	Soil Cracks (I ns Visible on Vegetated Con Sulfide Odd on Water Ta xplain in Ren Depth (i Depth (i	Aerial Ima oncave Si or (C1) ble (C2) narks)	agery (B7) urface (B8)	Secondary Water Si Drainag Salt De Oxidize Present Stunted Shallow Geomo Microto FAC-Ne Wetland Hyd	indicators (2 or more required) tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) the ce of Reduced Iron (C4) for Stressed Plants (D1) or Aquitard (D3) riphic Position (D2) pographic Relief (D4) seutral Test (D5)
PROLO Fetland Hy rimary Indi Surface High V Satura Water Sedim Drift D Mat of Iron D Feld Obsert face Water ter Table If turation Procludes cap	rdrology Indicators (any one in the Water (A1) Nater Table (A2) Intion (A3) Marks (B1) Intert Deposits (B2) Deposits (B3) If Crust of Algae or deposits (B5) Intert Depos	Mari (B4)	Surface S Inundation Sparsely Hydroger Dry Seas Other (Ex	Soil Cracks (I ns Visible on Vegetated Con Sulfide Odd on Water Ta xplain in Ren Depth (i Depth (i	Aerial Ima oncave Si or (C1) ble (C2) narks)	agery (B7) urface (B8)	Secondary Water Si Drainag Salt De Oxidize Present Stunted Shallow Geomo Microto FAC-Ne Wetland Hyd	indicators (2 or more required) tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) the ce of Reduced Iron (C4) for Stressed Plants (D1) or Aquitard (D3) riphic Position (D2) pographic Relief (D4) seutral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen	t Project Borough/Cit	y:North SI	ope			Sampling	Date	Aug 6, 2
Applicate/Owner: Brooks Range Petr	oleum							
Investigator(s): JBrekken, JO'Brien	La	ndform (hill:	side, terrace	, Huumock, e	te: hummocks	Sampling	Point:	B-14
Local Relief (concave, convex, none):	Concave	Slo	ope (%): <	1				
Subregion:	Lat:		Long		Datum:			
Are climate/hydrologic conditions on the	site typical for this time	e of year? Y	'es					
Are Vegetation?,No Soil? No	or Hydrocabon?	No	significantly	disturbed?	Are "Normal Circ	cumstances" Pro	esent?	Yes
Are Vegetation?, No Soil? No	or Hydrocabon?	No	naturally pr	oblematic?	(If needed, explain	any answers in R	emarks)	
SUMMARY OF FINDINGS - Attach sit	e map showing sampl	ing point is	ocations, tr	ansects, Imp	ortant features,	etc.		
Hydrophytic Vegetation Present?	Yes	Is the S	Sampled Are	а				
Hydric Soils Present?	Yes	within a	a Wetland?	Yes				
Wetland Hydrology Present?	Yes							
Remarks:								
VEGETATION (List all species	in plot)				7			
Tree Stratum (Use scientific names)		Absolute	- Sty 10,120,12	125,450,000,000,000	Dominance Test	worksheet:		
1		%Cover	Species		Number of Domin			(A)
2.					Total Number of I		-	- 00
3.					Species Across A		2	(B)
					Percent of Domin	ant Species		
4.	Total 0	-		1	That Are OBL, FA		50	(A/B)
Sampling/Shrub Stratum	50% of total cover:		of total cover		Prevalence in Total % Cover	Total Control of the		
Salix reticulata		5		FAC	OBL Species 5			
Salix niphoclada (brachycarpa)		2		COVER 1	FACW Species 3		70	3
3. Dryas integrifolia		25	Yes	FACU	FAC Species 7	x 3 =	21	
4.						35 x 4 =	140	
5.					UPL Species	x5=	0	(B)
6.					Column Totals: E	32 (A)	236	-
	Total C	over: 32			Prevalence Index	= B/A = 2.88	3	
Herb Stratum	50% of total cover: 16		of total cover:	6.4				
Eriophorum angustifolium		5		OBL	Hydrophytic Ve	getation indic	ators:	
2. Carex saxatilis		10		FACW	and building	Test is >50%		
3. Carex membranacea		10		FACW	▼ Prevalence			
7 - 3 - 7 - 7 - 7		7.00			upporting data in	al Adaptions' (F		rate sheet)
4. Equisetum arvense		10		INOU		Hydrophytic V	200	
5. Calamagrostis purpurascens		20	Yes	NI	'Indicators of hyd			
6. Arctagrostis latifolia		15	Yes	FACW	be present unless			
7.								
8.								
	Total C		at faial saces		A Service Control		Г	
Plot size (radius, or length x width) 15	50% of total cover: 35 radius % Ba	20% are Ground:	of total cover: 5	14	lydrophytic Veget	ation Present?	Y	es
% Cover of Wetland Bryophytes:		over of Bry		30				

•	rani	

3	3	١	4

(Inches)	Color (moist)	%	Color (moist)	%	Type ₁	Loc ₂	Texture Remarks	Remarks
0-2								Organics
2-20	2.5 Y 3/2	100					loamy sand	Organic/soil mix
Ξ								
Type: C=	Concentrations, D	=Depletion	ns, RM=Reduce	ed Matrix.	2Locati	on: PL=P	ore Linings, RC=Roo	t Channel, M=Matrix
Hydric Sc	oll Indicators:		Indica	ators for Prob	lematic H	lydric Sol	83:	37.60
X Histo	sol or Histel (A1)			Alaska Color	Change (TA4)4	Г	Alaska Gleyed Without Hue 5Y or
Histic	Epipedon (A2)			Alaska Alpine	Swales (TA5)		Redder Underlying Layer
Hydro	ogen Sulfide (A4)			Alaska Redox	x With 2.5	Y Hue	F.	Other (Explain in Remarks)
Thick	Dark Surface (A1:	2)						
Alask	ka Gleyed (A13)		3One	Indicator of hy	drophytic	vegetation	, one primary indicate	or of wetland hydrology,
Alask	ka Redox (A14)		and a	n appropriate	landscape	position n	nust be present.	
Alask	ca Gleyed Pores (A	15)	4Give	details of colo	r change i	n Remarks	S .	
Restrictive	Layer (if present):	None e	ncountered					.a. Va-
							Hydric Soils Pi	resent? Yes
Depth:							- W	-
emarks:				.a <u>. </u>				
emarks:	GY drology indication	F:		3-			Secondary I	ndicators (2 or more required)
marks: /DROLO /etland Hy			ufficient)	<u>-</u>			1 250 7 CM N'-1	ndicators (2 or more required) ained Leaves (B9)
marks: /DROLO /etland Hy	drology Indicator		Surface S	oil Cracks (B6	10000		☐ Water St	ained Leaves (B9) e Patterns (B10)
PMARKS: POROLO Petland Hyrimary India Surface	drology Indicators cators (any one ind		Surface S	oil Cracks (B6 s Visible on Ad	10000	ery (B7)	Water St. Drainage Salt Dep	ained Leaves (B9) e Patterns (B10) posits (C5)
POROLO Petland Hy rimary India Surface High W	drology Indication cators (any one ind e Water (A1)		Surface S	The state of the state of	erial Image		Water St. Drainage Salt Dep Oxidized	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3
POROLO Vetland Hyrimary India Surface High W Satural	drology Indication cators (any one ind e Water (A1) Vater Table (A2)		Surface S Inundation Sparsely	s Visible on A	erial Image ncave Surf		Water St. Drainage Salt Dep Oxidized Presence	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3 se of Reduced Iron (C4)
PMARKS: PMA	drology Indication cators (any one ind e Water (A1) Vater Table (A2) tion (A3)		Surface S Inundation Sparsely Hydrogen	s Visible on Ad Vegetated Cor	erial Image ncave Surf (C1)		Water St. Drainage Salt Dep Oxidized Presend Stunted	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3 e of Reduced Iron (C4) or Stressed Plants (D1)
Property of the control of the contr	drology Indicators cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1)		Surface S Inundation Sparsely Hydrogen Dry Seaso	s Visible on Ad Vegetated Cor Sulfide Odor	erial Image ncave Surf (C1) e (C2)		Water St. Drainage Salt Dep Oxidized Presend Stunted Shallow	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3 se of Reduced Iron (C4)
Print D	drology Indicators cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2)	icator is s	Surface S Inundation Sparsely Hydrogen Dry Seaso	s Visible on Ad Vegetated Cor Sulfide Odor on Water Table	erial Image ncave Surf (C1) e (C2)		Water St. Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C5) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3)
POROLO Vetland Hyrimary India Surface Wilder Satural Water Sedime Drift D Mat of	drology Indicators cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3)	icator is s	Surface S Inundation Sparsely Hydrogen Dry Seaso	s Visible on Ad Vegetated Cor Sulfide Odor on Water Table	erial Image ncave Surf (C1) e (C2)		Water St. Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2)
POROLO Vetland Hyrimary India Surface Wilder Satural Water Sedime Drift D Mat of	drology Indicators cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5)	icator is s	Surface S Inundation Sparsely Hydrogen Dry Seaso	s Visible on Ad Vegetated Cor Sulfide Odor on Water Table	erial Image ncave Surf (C1) e (C2)		Water St. Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4)
Property of the property of th	drology Indicators cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5)	icator is s	Surface S Inundation Sparsely Hydrogen Dry Seaso	s Visible on Ad Vegetated Cor Sulfide Odor on Water Table	erial Image ncave Surf (C1) e (C2) rks)		Water St. Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4)
POROLO Vetland Hyrimary India Surface Water Water Sedime Drift D Mat of Iron De	drology Indicators cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5) vations: r Present?	Mari (B4)	Surface S Inundation Sparsely Hydrogen Dry Seaso Other (Ex	s Visible on Ad Vegetated Cor Sulfide Odor on Water Table plain in Remai	erial Image ncave Surf (C1) e (C2) rks)		Water St. Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4)
Property of the property of th	drology Indicators cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Neposits (B5) vations: r Present? esent?	Mari (B4)	Surface S Inundation Sparsely Hydrogen Dry Seaso Other (Ex	s Visible on Advegetated Cor Sulfide Odor on Water Table plain in Remai	erial Image ncave Surf (C1) e (C2) rks)	ace (B8)	Water St. Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) putral Test (D5)
Property of the columbs of the colum	drology Indicators cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5) vations: r Present?	Mari (B4) No Yes Yes	Surface S Inundation Sparsely Hydrogen Dry Seaso Other (Ex	S Visible on Advegetated Cor Sulfide Odor on Water Table plain in Remain Depth (incomplete Corporation	erial Image ncave Surf (C1) e (C2) rks) thes):	2 0	Water St. Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) putral Test (D5)
Property of the columbs of the colum	drology Indicators cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5) vations: r Present? esent? esent? eillary fringe)	Mari (B4) No Yes Yes	Surface S Inundation Sparsely Hydrogen Dry Seaso Other (Ex	S Visible on Advegetated Cor Sulfide Odor on Water Table plain in Remain Depth (incomplete Corporation	erial Image ncave Surf (C1) e (C2) rks) thes):	2 0	Water St. Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) putral Test (D5)
Property of the columbs of the colum	drology Indicators cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Meposits (B5) vations: r Present? esent? esent? eillary fringe)	Mari (B4) No Yes Yes	Surface S Inundation Sparsely Hydrogen Dry Seaso Other (Ex	S Visible on Advegetated Cor Sulfide Odor on Water Table plain in Remain Depth (incomplete Corporation	erial Image ncave Surf (C1) e (C2) rks) thes):	2 0	Water St. Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) putral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen	t Project Borough	City: North S	lope		Sampling Date	Aug 7, 2
Applicate/Owner: Brooks Range Petr	roleum	-				
nvestigator(s): JBrekken, JO'Brien		Landform (hill	side, terrace	, Huumock,	etc: On top of pingo Sampling Point:	B-15
Local Relief (concave, convex, none):	Concave	SI	ope (%): 5			
Subregion:	L	at:	Long	1	Datum:	
Are climate/hydrologic conditions on the	e site typical for this	time of year?	/es			
Are Vegetation?,No Soil? No	or Hydrocabo	n? No	significantly	disturbed?	Are "Normal Circumstances" Present?	Yes
Are Vegetation?,No Soil? No	or Hydrocabo	n? No	naturally pr	oblematic?	(If needed, explain any answers in Remarks)	
UMMARY OF FINDINGS - Attach sit	e map showing sar	mpling point i	ocations, tra	ansects, imp	portant features, etc.	
lydrophytic Vegetation Present?	No	Is the	Sampled Are	а		
Hydric Soils Present?	No	within	a Wetland?	No		
Vetland Hydrology Present?	No					
Remarks: Point located on top of pingo						
/EGETATION (List all species	s in plot)					
Tree Stratum (Use scientific names)	100 100 150	Absolute		Indicator	Dominance Test worksheet:	
1.		%Cover	Species	Status	Number of Dominant Species That Are OBL, FACW, or FAC: 1	(A)
2.					Total Number of Dominant	
3.					Species Across All Strata: 2	(B)
4.					Percent of Dominant Species That Are OBL, FACW, FAC: 50	(A/B)
	To	al Cover:			Prevalence Index:	
Sampling/Shrub Stratum	50% of total cover:		of total cover:	100	Total % Cover of: Multiplied by:	
Salix reticulata		2		FAC	OBL Species 0 x 1 = 0	
2. Dryas integrifolia		70	Yes	FACU	FACW Species 0 x 2 = 0	
3. Cassiope tetragona		5		FACU	FAC Species 11 x 3 = 33 FACU Species 75 x 4 = 300	_
4.					FACU Species 75 x 4 = 300 UPL Species 2 x 5 = 10	_
5.				1	Column Totals: 88 (A) 343	(B)
6.						
	Contractor of the Value of the	al Cover: 77	MINA SAT	Star .	Prevalence Index = B/A = 3.90	
Herb Stratum	50% of total cover:	38.5 20%	of total cover:	15.4	Hydrophytic Vegetation indicators:	
Oxytropis nigrascens		2		NI	Dominance Test is >50%	
2. Silene acaulis		2		UPL	Prevalence Test is ≤3.0	
3. Carex obtusata		Z	Yes	NI	Morphological Adaptions' (Provide	
4. Poa arctica		5	Yes	FAC	supporting data in Remarks or on a spere	rate sheet)
5. Agropyron boreale		2		NI	Problematic Hydrophytic Vegetatio	n' Explain)
6. Festuca rubra		3		FAC	Indicators of hydric soil and wetland hydric soil and hydric s	
7. Polemonium acutiflorum		1		FAC	be present unless disturbed or problemic	<u>.</u>
		4				
8.	Tot	al Cover: 22				
	50% of total cover:	11 20%	of total cover:	4.4	Hydrophytic Vegetation Present?	No
Plot size (radius, or length x width) 15		Bare Ground			The state of the s	
% Cover of Wetland Bryophytes:	Tot	ai Cover of Bry	opnytes:	5		

0-16 10 R 2.5/2	100						Live	e roots reaching to 12	" bas
Type: C=Concentrations	, D=Depletion	s, RM=Reduc	ed Matrix.	2Locatio	on: PL=Po	ore Linings, RC=	Root Char	nnel, M=Matrix	_
Hydric Soli Indicators:	-	Indic	ators for Prot	blematic H	ydric Sol	83:			
Histosol or Histel (A1)		Alaska Color	Change (T	TA4)4	1	Alask	a Gleyed Without Hu	e 5Y or
Histic Epipedon (A2)			Alaska Alpine	e Swales (TA5)		Redde	er Underlying Layer	
Hydrogen Sulfide (A4)		Alaska Redo	x With 2.51	/ Hue	0	Othe	r (Explain in Remark	s)
Thick Dark Surface (A12)								
Alaska Gleyed (A13)		3One	Indicator of hy	ydrophytic v	vegetation	, one primary ind	icator of w	vetland hydrology,	
Alaska Redox (A14)		and a	an appropriate	landscape	position n	oust be present.			
Alaska Gleyed Pores	(A15)	4Give	details of cold	or change in	Remarks	s			
Restrictive Layer (if presen	nt): Frozen					Hydric Soli	s Present	? No	
Depth: 16" bgs	-							100	
marks:									
marks: DROLOGY etland Hydrology Indicat						-		ors (2 or more require	ed)
marks: DROLOGY etland Hydrology Indicated imary Indicators (any one		Sec. 15. 15. 15. 15.	Sail Crasks /DS	20		☐ Wate	Stained	Leaves (B9)	ed)
marks: DROLOGY etiand Hydrology Indicated imary Indicators (any one Surface Water (A1)	indicator is su	Surface S	Soil Cracks (B6	7 7 7 7 7 7 7 7 7 7	no. (P7)	☐ Wate	Stained	Leaves (B9) erns (B10)	ed)
marks: DROLOGY etiand Hydrology Indicate imary Indicators (any one Surface Water (A1) High Water Table (A2)	indicator is su	Surface S Inundation	ns Visible on A	erial Image		☐ Wate ☐ Drain ☐ Salt	r Stained nage Patte Deposits	Leaves (B9) erns (B10)	
TDROLOGY Setiand Hydrology Indicationary Indicators (any one Surface Water (A1) High Water Table (A2) Saturation (A3)	indicator is su	Surface S Inundation Sparsely	ns Visible on A Vegetated Cor	erial Image ncave Surfa		☐ Wate ☐ Drain ☐ Salt ☐ Oxid	r Stained nage Patte Deposits ized Rhize	Leaves (B9) erns (B10) (C5)	
marks: DROLOGY etiand Hydrology Indicate imary Indicators (any one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	indicator is su [[]	Surface S Inundation Sparsely Hydroger	ns Visible on A Vegetated Con Sulfide Odor	erial Image ncave Surfa (C1)		☐ Wate ☐ Drain ☐ Salt ☐ Oxid ☐ Pres	r Stained nage Patte Deposits ized Rhize ence of R	Leaves (B9) erns (B10) (C5) ospheres on Living R	
marks: [DROLOGY otland Hydrology Indicate mary Indicators (any one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	indicator is su [[]	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on A Vegetated Cor n Sulfide Odor on Water Table	erial Image ncave Surfa (C1) e (C2)		☐ Wate ☐ Drain ☐ Salt ☐ Oxid ☐ Pres ☐ Stur ☐ Shalt	r Stained nage Patte Deposits ized Rhize ence of R ated or Stra low Aquite	Leaves (B9) erns (B10) (C5) ospheres on Living R teduced Iron (C4) essed Plants (D1) ard (D3)	
marks: POROLOGY Setland Hydrology Indicate imary Indicators (any one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	indicator is su	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on A Vegetated Con Sulfide Odor	erial Image ncave Surfa (C1) e (C2)		Wate Drain Salt Oxid Pres Stur Shal	r Stained nage Patte Deposits ized Rhize ence of R ited or Str low Aquite morphic P	Leaves (B9) erns (B10) (C5) ospheres on Living R deduced Iron (C4) essed Plants (D1) ard (D3) Position (D2)	
PROLOGY Setiand Hydrology Indicate imary Indicators (any one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae (B3)	indicator is su	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on A Vegetated Cor n Sulfide Odor on Water Table	erial Image ncave Surfa (C1) e (C2)		☐ Wate ☐ Drain ☐ Salt ☐ Oxid ☐ Pres ☐ Sturn ☐ Shal ☐ Geo ☐ Micr	r Stained Inage Patter Deposits (ized Rhize) Ized Rhize Ized or Street or Street Illow Aquite Imorphic Potopograp	Leaves (B9) erns (B10) (C5) ospheres on Living Reduced Iron (C4) essed Plants (D1) ard (D3) Position (D2) othic Relief (D4)	
marks: POROLOGY Setland Hydrology Indicate imary Indicators (any one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	indicator is su	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on A Vegetated Cor n Sulfide Odor on Water Table	erial Image ncave Surfa (C1) e (C2)		☐ Wate ☐ Drain ☐ Salt ☐ Oxid ☐ Pres ☐ Sturn ☐ Shal ☐ Geo ☐ Micr	r Stained nage Patte Deposits ized Rhize ence of R ited or Str low Aquite morphic P	Leaves (B9) erns (B10) (C5) ospheres on Living Reduced Iron (C4) essed Plants (D1) ard (D3) Position (D2) othic Relief (D4)	
PROLOGY Setiand Hydrology Indicate imary Indicators (any one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae (B3)	indicator is su	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on A Vegetated Cor n Sulfide Odor on Water Table	erial Image ncave Surfa (C1) e (C2)		☐ Wate ☐ Drain ☐ Salt ☐ Oxid ☐ Pres ☐ Sturn ☐ Shal ☐ Geo ☐ Micr	r Stained Inage Patter Deposits (ized Rhize) Ized Rhize Ized or Street or Street Illow Aquite Imorphic Potopograp	Leaves (B9) erns (B10) (C5) ospheres on Living Reduced Iron (C4) essed Plants (D1) ard (D3) Position (D2) othic Relief (D4)	
marks: PROLOGY Setland Hydrology Indicate imary Indicators (any one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae of Iron Deposits (B5)	indicator is su	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on A Vegetated Cor n Sulfide Odor on Water Table	erial Image ncave Surfa (C1) e (C2) arks)		☐ Wate ☐ Drain ☐ Salt ☐ Oxid ☐ Pres ☐ Sturn ☐ Shal ☐ Geo ☐ Micr	r Stained Inage Patter Deposits (ized Rhize) Ized Rhize Ized or Street or Street Illow Aquite Imorphic Potopograp	Leaves (B9) erns (B10) (C5) ospheres on Living Reduced Iron (C4) essed Plants (D1) ard (D3) Position (D2) othic Relief (D4)	
marks: DROLOGY Setiand Hydrology Indicate imary Indicators (any one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae of Iron Deposits (B5)	indicator is su	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on A Vegetated Cor n Sulfide Odor on Water Tabl xplain in Rema	erial Image ncave Surfa (C1) le (C2) lrks)		☐ Wate ☐ Drain ☐ Salt ☐ Oxid ☐ Pres ☐ Stur ☐ Sha ☐ Geo ☐ Micr ☐ FAC	r Stained Inage Patter Deposits (ized Rhize) Bence of Reted or Street or Str	Leaves (B9) erns (B10) (C5) ospheres on Living Reduced Iron (C4) essed Plants (D1) ard (D3) Position (D2) othic Relief (D4)	
marks: POROLOGY Setiand Hydrology Indicate imary Indicators (any one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Mat of Crust of Algae of Iron Deposits (B5) eld Observations: face Water Present?	indicator is su	Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on A Vegetated Cor n Sulfide Odor son Water Table xplain in Rema	erial Image ncave Surfa (C1) le (C2) lrks)		☐ Wate ☐ Drain ☐ Salt ☐ Oxid ☐ Pres ☐ Stur ☐ Sha ☐ Geo ☐ Micr ☐ FAC	r Stained Inage Patter Deposits (ized Rhize) Bence of Reted or Street or Str	Leaves (B9) erns (B10) (C5) ospheres on Living Reduced Iron (C4) essed Plants (D1) ard (D3) Position (D2) ohic Relief (D4) Fest (D5)	
marks: PROLOGY Setland Hydrology Indicate imary Indicators (any one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae of Iron Deposits (B5) eld Observations: face Water Present? ter Table Present?	indicator is su	Surface S Inundation Sparsely Hydroger Dry Seas Other (E)	ns Visible on A Vegetated Cor n Sulfide Odor son Water Table xplain in Rema Depth (inc.) Depth (inc.)	erial Image ncave Surfa (C1) e (C2) arks) ches): ches):	ace (B8)	Wate Drain Salt Oxid Pres Stur Shal Geo Micr FAC	r Stained Inage Patter Deposits (ized Rhize) Bence of Reted or Street or Str	Leaves (B9) erns (B10) (C5) ospheres on Living Reduced Iron (C4) essed Plants (D1) ard (D3) Position (D2) ohic Relief (D4) Fest (D5)	
marks: PDROLOGY Petiand Hydrology Indicate imary Indicators (any one Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae of Iron Deposits (B5) Petid Observations: face Water Present? Iter Table Present? Iter Table Present?	indicator is su	Surface S Inundation Sparsely Hydroger Dry Seas Other (E)	ns Visible on A Vegetated Cor n Sulfide Odor son Water Table xplain in Rema Depth (inc.) Depth (inc.)	erial Image ncave Surfa (C1) e (C2) arks) ches): ches):	ace (B8)	Wate Drain Salt Oxid Pres Stur Shal Geo Micr FAC	r Stained Inage Patter Deposits (ized Rhize) Bence of Reted or Street or Str	Leaves (B9) erns (B10) (C5) ospheres on Living Reduced Iron (C4) essed Plants (D1) ard (D3) Position (D2) ohic Relief (D4) Fest (D5)	

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen		ty:North SI	ope			Sampling	Date	Aug 7
Applicate/Owner: Brooks Range Peti	roleum					Sampling	Point	B-16
Investigator(s): JBrekken, JO'Brien	La	Section of the	side, terrace		etc: polygons		, ,	-
Local Relief (concave, convex, none):	none	Slo	ope (%): <	1				
Subregion:	Lat:		Long		Datum:			
Are climate/hydrologic conditions on th	e site typical for this tim	e of year? Y	'es					
Are Vegetation?,No Soil? No	or Hydrocabon?	No	significantly	disturbed?	Are "Normal Circ	cumstances" Pre	sent?	Yes
Are Vegetation?,No Soil? No	or Hydrocabon?	No	naturally pr	oblematic?	(If needed, explain	any answers in Re	emarks)	
SUMMARY OF FINDINGS - Attach sit	e map showing samp	iing point i	ocations, tra	ansects, Im	portant features,	etc.		
Hydrophytic Vegetation Present?	Yes	Is the S	Sampled Are	a				
Hydric Soils Present?	Yes	within	a Wetland?	Yes				
Wetland Hydrology Present?	Yes							
Remarks:								
/EGETATION (List all species	s in plot)							
Tree Stratum (Use scientific names)		Absolute	The state of the s	Indicator Status	Dominance Test	worksheet:	-	
1.		%Cover	Species	Status	Number of Domir That Are OBL, FA		2	(A)
2.					Total Number of		-	- 4.9
14					Species Across		4	(B)
3.					Percent of Domir	ant Species		
4.	Total (That Are OBL, FA	5-3-7-4-30-0-1	50	(A/B)
Sampling/Shrub Stratum	50% of total cover:		of total cover:		Prevalence In	dex: of: Multiplied by		
1. Salix planifolia		2		FACW	1 2 1 4 7 7 7 7	5 x1=	_	
2. Salix reticulata		10	Yes	FAC	FACW Species		124	
3. Salix rotundifolia		5		NI	FAC Species	28 x 3 =	84	
4. Cassiope tetragona		10	Yes	FACU	Telephone Management	35 x 4 =	140	3
5. Dryas integrifolia		25	Yes	FACU		x 5 =	0	(B)
6.		20	169	LACO	Column Totals:	130 (A)	353	
Ma Ma	Total (Cover: 52			Prevalence Index	(= B/A = 2.72	2	
Herb Stratum	50% of total cover: 26		of total cover.	10.4		-		_
Eriophorum vaginatum		60	Yes	EACW	Hydrophytic Ve	getation indic	ators:	
2. Eriophorum angustifolium		5	230	OBL		Test is >50%		
						Test is ≤3.0		
3. Polygonum viviparum		1		FAC		cal Adaptions' (F		
Oxytropis nigrascens		1		NI	supporting data in	Hydrophytic Ve		
5. Carex bigelowii		15		FAC		11.00		
6. Vaccinium vitis-idaea		2		FAC	'Indicators of hyd be present unles			
z.					1.12,245			
8.								
THE LUMB .	Total (Cover: 84			22. 885. 8		-	
Plot size (radius, or length x width) 1	50% of total cover: 42 5' radius % R	20% are Ground:	of total cover:	16.8	Hydrophytic Vege	tation Present?	Y	es
% Cover of Wetland Bryophytes:		Cover of Bry		5				

Remarks: DP located in broad trough of polygons - tops of polygons are relatively flat with Enophorum tussocks. White crustose lichens common.

Sampling Point:

0-2									Organics
-	E. 5 20 00 0	- Since						79.00	
2-4	5 YR 3/2	100						loamy sand	Organic/soil mix w/ high inter
4-10	7.5 YR 3/2	100						silty clay loam	Organics/soil mix - less roots
10-12	2.5 Y 2.5/1	100						loamy sand	Loose soil and organics
1Type: C=	=Concentrations,	D=Depletion	ns, RM=Redi	uced Mat	rix.	2Locati	on: PL=Po	ore Linings, RC=Root	Channel, M=Matrix
Hydric Sc	oil indicators:		Ind	licators	for Prob	lematic H	ydric Soll	8):	
X Histo	sol or Histel (A1)		F	Alask	a Color	Change (ΓA4)4	Г	Alaska Gleyed Without Hue 5Y or
Histic	Epipedon (A2)		Г	Alask	a Alpine	Swales (TA5)		Redder Underlying Layer
Hydr	ogen Sulfide (A4)			Alask	a Redox	With 2.5	/ Hue	(F)	Other (Explain in Remarks)
Thick	k Dark Surface (A	12)							
T Alasi	ka Gleyed (A13)		3Or	ne Indica	tor of hy	drophytic	vegetation	, one primary indicate	or of wetland hydrology,
T Alasi	ka Redox (A14)		and	an appr	ropriate I	andscape	position m	nust be present.	
☐ Alas	ka Gleyed Pores (A15)	4Gi	ve detail	s of colo	r change i	n Remarks		
Destriction	e Layer (if present): Frozen							
Restrictive		PTOZUM						Hydric Solls Pr	esent? Yes
Restrictive									
Depth:	12" bgs								
Depth:		rs:						Secondary In	idicators (2 or more required)
Depth: emarks: YDROLO Vetland Hy	OGY		sufficient)						ndicators (2 or more required)
Depth:	DGY drology Indicato			e Soil Cra	acks (B6)			☐ Water Sta	
Depth: PMOLO Vetland Hy rimary India Surface	OGY drology Indicato cators (any one in		Surface		E) erial Image	ery (B7)	Water Sta	nined Leaves (B9)
Depth: PMOLO Vetland Hy rimary India Surface High V	OGY drology Indicato cators (any one in se Water (A1)		Surface	ions Visit	ole on Ae			Water Sta Drainage Salt Dep Oxidized	nined Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C
Depth: PMOLO Vetland Hy rimary India Surfac High V Satura	OGY rdrology Indicato cators (any one in the Water (A1) Vater Table (A2)		Surface Inundati Sparse	ions Visit	ole on Adated Con	erial Image Icave Surf		Water Sta Drainage Salt Dep Oxidized Presence	nined Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C5) e of Reduced Iron (C4)
Depth: PMOLO Vetland Hy rimary Indi Surfac High V Satura Water	OGY drology Indicato cators (any one in the Water (A1) Vater Table (A2) tion (A3)		Surface Inundati Sparse Hydrog	ions Visit ly Vegeta	ole on Adated Con le Odor (erial Image cave Surf (C1)		Water Sta Drainage Salt Dep Oxidized Presence Stunted	nined Leaves (B9) Patterns (B10) Posits (C5) Rhizospheres on Living Roots (C5) Posits (C4) Rhizospheres on C4) Posits (C4) Posits (C4) Posits (C4)
Depth: Primary India Surface High V X Satura Water Sedim	OGY Idrology Indicato cators (any one in the Water (A1) Vater Table (A2) tion (A3) Marks (B1)		Surface Inundati Sparse Hydrog Dry See	ions Visit ly Vegeta en Sulfid	ole on Ae ated Con le Odor (ter Table	erial Image cave Surf (C1) e (C2)		Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow	ained Leaves (B9) Patterns (B10) Posits (C5) Rhizospheres on Living Roots (C5) Posits (C4)
Depth: Primary India Surface High W X Satura Water Sedim Drift D	OGY Idrology Indicato cators (any one in the Water (A1) Vater Table (A2) tion (A3) Marks (B1) tent Deposits (B2)	dicator is s	Surface Inundati Sparse Hydrog Dry See	ions Visit ly Vegeta en Sulfid ason Wa	ole on Ae ated Con le Odor (ter Table	erial Image cave Surf (C1) e (C2)		Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomory	ained Leaves (B9) Patterns (B10) Posits (C5) Rhizospheres on Living Roots (C5) Posits (C4) Posits (C4) Posits (C4) Posits (C4) Position (C4) Position (D2)
Depth: Properties Properties	OGY Idrology Indicato cators (any one in the Water (A1) Vater Table (A2) tion (A3) Marks (B1) tent Deposits (B2) deposits (B3)	dicator is s	Surface Inundati Sparse Hydrog Dry See	ions Visit ly Vegeta en Sulfid ason Wa	ole on Ae ated Con le Odor (ter Table	erial Image cave Surf (C1) e (C2)		Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomory Microtop	ained Leaves (B9) Patterns (B10) Posits (C5) Rhizospheres on Living Roots (C5) Posits (C4)
Depth: PMOLO Vetland Hy rimary Indi Surfac High V Satura Water Sedim Drift D Mat of	ogy rdrology Indicato cators (any one in the Water (A1) Vater Table (A2) tion (A3) Marks (B1) tent Deposits (B2) teposits (B3) f Crust of Algae or	dicator is s	Surface Inundati Sparse Hydrog Dry See	ions Visit ly Vegeta en Sulfid ason Wa	ole on Ae ated Con le Odor (ter Table	erial Image cave Surf (C1) e (C2)		Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomory Microtop	ained Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) ohic Position (D2) ographic Relief (D4)
Depth: Properties Properties	ocators (any one in the Water (A1) Vater Table (A2) tion (A3) Marks (B1) tent Deposits (B2) deposits (B3) f Crust of Algae or deposits (B5)	Mart (B4)	Surface Inundati Sparse Hydrog Dry Sea	ions Visit ly Vegeta en Sulfid ason Wa Explain i	ole on Adated Con de Odor (de Table n Remai	erial Image icave Surf (C1) e (C2) rks)		Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomory Microtop	ained Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) ohic Position (D2) ographic Relief (D4)
Depth: PMOLO Vetland Hy rimary Indi Surfac High V Satura Water Sedim Drift D Mat of	ocators (any one in the Water (A1) Vater Table (A2) tion (A3) Marks (B1) tent Deposits (B2) deposits (B3) f Crust of Algae or deposits (B5)	dicator is s	Surface Inundati Sparse Hydrog Dry Sea	ions Visit ly Vegeta en Sulfid ason Wa Explain i	ole on Ae ated Con le Odor (ter Table	erial Image icave Surf (C1) e (C2) rks)		Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomory Microtop	ained Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) ohic Position (D2) ographic Relief (D4)
Depth: Properties Properties	ocators (any one in the Water (A1) Vater Table (A2) Ition (A3) Marks (B1) Itent Deposits (B2) Itent Deposits (B3) If Crust of Algae or Itensity (B5)	Mart (B4)	Surface Inundati Sparse Hydrog Dry See	ions Visitily Vegeta en Sulfid ason Wa Explain i	ole on Adated Con de Odor (de Table n Remai	erial Image cave Surf (C1) e (C2) rks)		Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomory Microtop FAC-Net	ained Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) ohic Position (D2) ographic Relief (D4)
Depth: Primary India Surface High V X Satura Water Sedim Drift D Mat of Iron Delta Control Iron Delta Contr	OGY Indicato cators (any one in the Water (A1) Vater Table (A2) Ition (A3) Marks (B1) Itent Deposits (B2) Peposits (B3) If Crust of Algae or eposits (B5) Invations: In Present? Present?	Marl (B4)	Surface Inundati Sparse Hydrog Dry See	ions Visiti ly Vegeta en Sulfid ason Wa Explain i De	ole on Ae ated Con le Odor (ter Table n Remai	erial Image icave Surf (C1) e (C2) rks) hes):		Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomory Microtop FAC-Net	ained Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) ohic Position (D2) ographic Relief (D4) utral Test (D5)
Depth: Primary India Surface High V Satura Water Sedim Drift D Mat of Iron Do	OGY rdrology Indicato cators (any one in the Water (A1) Vater Table (A2) tion (A3) Marks (B1) tent Deposits (B2) tepposits (B3) f Crust of Algae or teposits (B5) rvations: ter Present?	Mari (B4)	Surface Inundati Sparse Hydrog Dry See Other (ions Visitily Vegeta en Sulfid ason Wa Explain i De	ole on Ae ated Con le Odor (ter Table n Remai	erial Image cave Surf (C1) e (C2) rks) hes): hes):		Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop FAC-Nei	ained Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) ohic Position (D2) ographic Relief (D4) utral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen	nt Project Borough/Ci	ty:North SI	ope		Sampli	ng Date	Aug 7, 2
Applicate/Owner: Brooks Range Pet	roleum					7-7	-
Investigator(s): JBrekken, JO'Brien	La	indform (hill	side, terrace	Huumock, e	te: tussocks and troug	ng Point:	B-17
Local Relief (concave, convex, none):	none	Sid	ope (%): <				
Subregion:	Lat:		Long		Datum:		
Are climate/hydrologic conditions on the	e site typical for this tim	e of year? Y	'es				
Are Vegetation?,No Soil? No	or Hydrocabon?	No	significantly	disturbed?	Are "Normal Circumstances" P	resent?	Yes
Are Vegetation?,No Soil? No	or Hydrocabon?	No	naturally pr	oblematic?	(If needed, explain any answers in	Remarks)	
SUMMARY OF FINDINGS - Attach si	te map showing samp	ling point is	ocations, tra	insects, Imp	ortant features, etc.		
Hydrophytic Vegetation Present?	Yes	Is the S	Sampled Are	а			
Hydric Soils Present?	Yes	within	a Wetland?	Yes			
Wetland Hydrology Present?	Yes						
Remarks: Tussocks common and random	troughs present						
VEGETATION (List all specie	s in plot)						
Tree Stratum (Use scientific names		Absolute			Dominance Test worksheet:		
1.	,	%Cover	Species		Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
2.					Total Number of Dominant	-	- 44
3.					Species Across All Strata:	3	(B)
T .				6	Percent of Dominant Species		
4.	T-101	and the same of th			That Are OBL, FACW, FAC:	66	(A/B)
Sampling/Shrub Stratum	Total (50% of total cover:	19.16.	of total cover:		Prevalence Index:		
1. Salix planifolia		5		FACW	Total % Cover of: Multiplied t OBL Species 11 x 1 =		
2. Salix reticulata		5		-cru - 1	FACW Species 55 x 2 =	-	-
3. Dryas integrifolia		20	Yes	FACU	FAC Species 15 x 3 =	45	
4.					FACU Species 20 x 4 =	80	
5.					UPL Species 0 x 5 =	-	— (B)
6.					Column Totals: 101 (A)	246	
	Total (Cover: 30			Prevalence Index = B/A = 2.	44	
Herb Stratum	50% of total cover: 15		of total cover:	6	4 M M M M M M M M M M M M M M M M M M M		
Eriophorum angustifolium		10		OBL	Hydrophytic Vegetation Indi	cators:	
2. Saxafraga hirculus		1		OBL	▼ Dominance Test is >50%		
			Von	1000	Prevalence Test is ≤3.0	ACT 13 A A ST	
3. Carex membranacea		30	Yes	FACW	Morphological Adaptions' upporting data in Remarks or o		rate sheet)
4. Eriophorum vaginatum		20	Yes	17.011	Problematic Hydrophytic		
5. Carex bigelowii		10		FAC	Indicators of hydric soil and we		
6.					be present unless disturbed or		
Z.							
8.							
		Cover: 71				É	
Plot size (radius, or length x width)	50% of total cover: 35 5' radius % B	are Ground:	of total cover:	14.2	lydrophytic Vegetation Present	,	'es
% Cover of Wetland Bryophytes:		Cover of Bry		15			

(Inches) Color (moist)	% Color (mo	ist) %	Type ₁ Loc ₂	Texture Remarks	- A - A - A - A - A - A - A - A - A - A
0-4					Organics*
4-10 7.5 YR 3/1	100		_	clay loam	organics w/ some gravel mixe
10-14 2.5 Y 2.5/1	100		-	loamy sand	decomposing material mixed
1Type: C=Concentrations, D=	=Depletions, RM=Red	uced Matrix.	2Location: PL=	Pore Linings, RC=Roo	ot Channel, M=Matrix
Hydric Soll Indicators:	Inc	dicators for Prob	lematic Hydric Sc	olisa:	
		- Alaska Color	Change (TA4)4	-	Alaska Gleyed Without Hue 5Y or
Histic Epipedon (A2)	i i		Swales (TA5)		Redder Underlying Layer
X Hydrogen Sulfide (A4)	Ť	Alaska Redox	With 2.5Y Hue		Other (Explain in Remarks)
Thick Dark Surface (A12)				Action Read Street and Action Street
Alaska Gleyed (A13)		ne Indicator of hy	drophytic vegetation	n, one primary indical	tor of wetland hydrology,
Alaska Redox (A14)	an	d an appropriate I	landscape position	must be present.	12.12.13.01.12.1
Alaska Gleyed Pores (A			r change in Remar		
Restrictive Layer (if present):	Frozen			10000000	
	FIGZen			Hydric Solls P	resent? Yes
Depth: 14" bgs		* 0-4" bç	gs organic soil laye	r with predominantly o	organics (unable to get soil color)
emarks:		* 0-4" bg	gs organic soil laye		
emarks: YDROLOGY Vetland Hydrology Indicators		* 0-4" bç	gs organic soil laye	Secondary	Indicators (2 or more required)
emarks: YDROLOGY Vetland Hydrology Indicators Irimary Indicators (any one indi	cator is sufficient)			Secondary	Indicators (2 or more required)
emarks: YDROLOGY Vetland Hydrology Indicators rimary Indicators (any one indi Surface Water (A1)	cator is sufficient)Surface	e Soil Cracks (B6)		Secondary Water St	Indicators (2 or more required)
emarks: YDROLOGY Vetland Hydrology Indicators rimary Indicators (any one indi Surface Water (A1) High Water Table (A2)	cator is sufficient) Surface Inundat	e Soil Cracks (B6)) erial Imagery (B7)	Secondary Water St Drainag Salt De	Indicators (2 or more required) tained Leaves (B9) the Patterns (B10)
POROLOGY Vetland Hydrology Indicators rimary Indicators (any one indi Surface Water (A1) High Water Table (A2) Saturation (A3)	cator is sufficient) Surface Inundat Sparse	e Soil Cracks (B6) tions Visible on Ae lly Vegetated Con) erial Imagery (B7) acave Surface (B8)	Secondary Water Si Drainag Salt De Oxidize	Indicators (2 or more required) tained Leaves (B9) the Patterns (B10) the posits (C5)
emarks: YDROLOGY Vetland Hydrology Indicators rimary Indicators (any one indi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	cator is sufficient) Surface Inundat Sparse Hydrog	e Soil Cracks (B6) tions Visible on Ae ely Vegetated Con gen Sulfide Odor () erial Imagery (B7) licave Surface (B8) (C1)	Secondary Water Si Drainag Salt De Oxidize Present	Indicators (2 or more required) tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) to of Reduced Iron (C4) I or Stressed Plants (D1)
Process Pro	cator is sufficient) Surface Inundat Sparse Hydrog Dry Se	e Soil Cracks (B6) ions Visible on Ae ly Vegetated Con gen Sulfide Odor (ason Water Table) erial Imagery (B7) locave Surface (B8) (C1) e (C2)	Secondary Water St Drainag Salt De Oxidize Present Stunted Shallow	Indicators (2 or more required) tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) to e of Reduced Iron (C4) I or Stressed Plants (D1) of Aquitard (D3)
POROLOGY Vetland Hydrology Indicators rimary Indicators (any one indi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	cator is sufficient) Surface Inundat Sparse Hydrog Dry Se	e Soil Cracks (B6) tions Visible on Ae ely Vegetated Con gen Sulfide Odor () erial Imagery (B7) locave Surface (B8) (C1) e (C2)	Secondary Water St Drainag Salt De Oxidize Present Stunted Shallow Geomo	Indicators (2 or more required) tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) the ce of Reduced Iron (C4) I or Stressed Plants (D1) of Aquitard (D3) rphic Position (D2)
Process Pro	cator is sufficient) Surface Inundat Sparse Hydrog Dry Se	e Soil Cracks (B6) ions Visible on Ae ly Vegetated Con gen Sulfide Odor (ason Water Table) erial Imagery (B7) locave Surface (B8) (C1) e (C2)	Secondary Water St Drainag Salt De Oxidize Present Stunted Shallow Geomo	Indicators (2 or more required) tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) to e of Reduced Iron (C4) If or Stressed Plants (D1) of Aquitard (D3) rphic Position (D2) pographic Relief (D4)
POROLOGY Vetland Hydrology Indicators rimary Indicators (any one indi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or M	cator is sufficient) Surface Inundat Sparse Hydrog Dry Se	e Soil Cracks (B6) ions Visible on Ae ly Vegetated Con gen Sulfide Odor (ason Water Table) erial Imagery (B7) locave Surface (B8) (C1) e (C2)	Secondary Water St Drainag Salt De Oxidize Present Stunted Shallow Geomo	Indicators (2 or more required) tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) the ce of Reduced Iron (C4) I or Stressed Plants (D1) of Aquitard (D3) rphic Position (D2)
POROLOGY Vetland Hydrology Indicators Vimary Indicators (any one indi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Mater Deposits (B5) Iron Deposits (B5)	Cator is sufficient) Surface Inundat Sparse Hydrog Dry Se Other (e Soil Cracks (B6) tions Visible on Ae ely Vegetated Con gen Sulfide Odor (ason Water Table (Explain in Reman	erial Imagery (B7) ncave Surface (B8) (C1) a (C2) rks)	Secondary Water St Drainag Salt De Oxidize Present Stunted Shallow Geomo	Indicators (2 or more required) tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) to e of Reduced Iron (C4) If or Stressed Plants (D1) of Aquitard (D3) rphic Position (D2) pographic Relief (D4)
Proposits (B5) Proposits (B5) Proposits (B5) Proposits (B5) Proposits (B5)	cator is sufficient) Surface Inundat Sparse Hydrog Dry Se	e Soil Cracks (B6) ions Visible on Ae ly Vegetated Con gen Sulfide Odor (ason Water Table	erial Imagery (B7) ncave Surface (B8) (C1) a (C2) rks)	Secondary Water St Drainag Salt De Oxidize Present Stunted Shallow Geomo	Indicators (2 or more required) tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) to e of Reduced Iron (C4) If or Stressed Plants (D1) of Aquitard (D3) rphic Position (D2) pographic Relief (D4)
POROLOGY Vetland Hydrology Indicators Vimary Indicators (any one indi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Mater Deposits (B5) Iron Deposits (B5)	Cator is sufficient) Surface Inundat Sparse Hydrog Dry Se Other (e Soil Cracks (B6) tions Visible on Ae ely Vegetated Con gen Sulfide Odor (ason Water Table (Explain in Reman	erial Imagery (B7) licave Surface (B8) (C1) la (C2) lrks)	Secondary Water Si Drainag Salt De Oxidize Present Stunted Shallow Geomo Microto FAC-Ne	Indicators (2 or more required) tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) to e of Reduced Iron (C4) If or Stressed Plants (D1) of Aquitard (D3) rphic Position (D2) pographic Relief (D4)
POROLOGY Vetland Hydrology Indicators Verimary Indicators (any one indi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Mater Marks (B5) Iron Deposits (B5) Verification (Cator is sufficient) Surface Inundat Sparse Hydrog Dry Se Other of No No Yes	e Soil Cracks (B6) tions Visible on Ae ely Vegetated Con gen Sulfide Odor (ason Water Table (Explain in Reman Depth (incl Depth (incl	hes): hes): 0	Secondary Water Si Drainag Salt De Oxidize Presen Stunted Shallow Geomo Microto FAC-Ne Wetland Hyd	Indicators (2 or more required) tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) to of Reduced Iron (C4) If or Stressed Plants (D1) of Aquitard (D3) orphic Position (D2) pographic Relief (D4) teutral Test (D5)
emarks: POROLOGY Vetland Hydrology Indicators rimary Indicators (any one indi Surface Water (A1) High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or N Iron Deposits (B5) Veld Observations: rface Water Present? Atter Table Present?	Cator is sufficient) Surface Inundat Sparse Hydrog Dry Se Other of No No Yes	e Soil Cracks (B6) tions Visible on Ae ely Vegetated Con gen Sulfide Odor (ason Water Table (Explain in Reman Depth (incl Depth (incl	hes): hes): 0	Secondary Water Si Drainag Salt De Oxidize Presen Stunted Shallow Geomo Microto FAC-Ne Wetland Hyd	Indicators (2 or more required) tained Leaves (B9) the Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) to of Reduced Iron (C4) If or Stressed Plants (D1) of Aquitard (D3) orphic Position (D2) pographic Relief (D4) teutral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen	t Project Borough/Cit	y:North SI	ope			Sampling Date	Aug 7, 2
Applicate/Owner: Brooks Range Petr	oleum						-
Investigator(s): JBrekken, JO'Brien	La	ndform (hills	side, terrace	, Huumock, e	tc: see remarks	Sampling Point:	B-18
Local Relief (concave, convex, none):	concave	Sid	ope (%): <	1	_	_	
Subregion:	Lat:		Long	:	Datum:		
Are climate/hydrologic conditions on the	site typical for this time	e of year? Y	'es				
Are Vegetation?,No Soil? No	or Hydrocabon?	No	significantly	y disturbed?	Are "Normal Circum:	stances" Present?	Yes
Are Vegetation?,No Soil? No	or Hydrocabon?	No	naturally pr	oblematic?	(If needed, explain any	answers in Remarks)	
SUMMARY OF FINDINGS - Attach site	e map showing sampl	ling point le	ocations, tr	ansects, Imp	ortant features, etc.		
Hydrophytic Vegetation Present?	Yes		Sampled Are				
Hydric Soils Present?	Yes	within a	a Wetland?	Yes			
Wetland Hydrology Present?	Yes						
Remarks: Landform: terrace/basin with from	st boils towards edge of ba	asin and wette	er in the middle	e			
VEGETATION (List all species	in plot)						
Tree Stratum (Use scientific names)		Absolute		Indicator	Dominance Test wo	rksheet	
1.		%Cover	Species	Status	Number of Dominant That Are OBL, FACV		(A)
2.					Total Number of Dom		- 44
3.					Species Across All S	2.7.2.2.2	(B)
					Percent of Dominant		
4.	Total C	over.			That Are OBL, FACV		(A/B)
Sampling/Shrub Stratum	50% of total cover:		of total cover:		Prevalence Index Total % Cover of: I		
1. Salix ovalifolia		2		EAC	OBL Species 74	x1 = 74	2
2. Dryas integrifolia		10	Yes	FACU	FACW Species 7	x2= 14	_
3.					FAC Species 12	x 3 = 36	
4.					FACU Species 10	x 4 = 40	_
5.					UPL Species 0 Column Totals: 103	(A) 164	(B)
6.					Coldinii Totals. 103		=
	Total C	over: 12			Prevalence Index = E	I/A = 1.59	
Herb Stratum	50% of total cover: 6	20%	of total cover:	2.4	The winds		
Pedicularis sudetica		2		FACW	Hydrophytic Veget		
Eriophorum angustifolium		10		OBL	Dominance Tes		
3, Carex aquatilis		60	Yes	OBL	Prevalence Tes	daptions' (Provide	
4. Carex saxatilis		5			supporting data in Ren		rate sheet)
5. Carex bigelowii		10		FAC		drophytic Vegetatio	
					Indicators of hydric :		
6. Juncus arcticus		4		OBL	be present unless dis		
7.							
8.	2743	125 41					
	Total C 50% of total cover: 45		of total cover:	18.2	lydrophytic Vegetatio	n Present?	/es
Plot size (radius, or length x width) 15		are Ground:			iyaropiiyuo vegetatio	ii i idodiiti	65
% Cover of Wetland Bryophytes:	Total C	Cover of Bry	ophytes:	35			

Sampling Point:

2-12 5 Y 3/2 100 loamy sand coarse to fine sand matrix virtual coarse to fine sand mat	(Inches)	Color (moist)	%	Color (moist)	- %	Type ₁	LOC2	Texture Remarks	Remarks
12-20 5 Y 4/1 100 sandy clay loam fine sand matrix w/ <50% documents of the sand matr	0-2								Organics*
Indicators: Indicators: Indicators for Problematic Hydric Solis: Histosol or Histel (A1)	2-12	5 Y 3/2	100					loamy sand	coarse to fine sand matrix w/
Hydric Soil Indicators: Indicators for Problematic Hydric Soils: Histoic Epipedon (A2)	12-20	5 Y 4/1	100					sandy clay loam	fine sand matrix w/ <50% dec
Histosol or Histel (A1)	1Type: C=	=Concentrations, D	=Depletion	s, RM=Reduc	ed Matrix.	2Locati	on: PL=P	ore Linings, RC=Root	Channel, M=Matrix
Histic Epipedon (A2) Alaska Alpine Swales (TA5) Hydrogen Sulfide (A4) Alaska Redox With 2.5Y Hue Other (Explain in Remarks) Other (Explain in Remarks) Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15) Restrictive Layer (if present): none encountered Depth: *O-2" bgs organic surface layer with >50% roots with some sand (unable to get companies of the companies of	Hydric Sc	oll Indicators:		Indic	ators for Pro	blematic F	lydric Sol	ls:	
Comment Comm	X Histo	sol or Histel (A1)		Г	Alaska Colo	Change (TA4)4	Γ.	Alaska Gleyed Without Hue 5Y or
Thick Dark Surface (A12) Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15) Alaska Redox (A14) Alaska Redox (A	Histic	Epipedon (A2)			Alaska Alpin	e Swales (TA5)	·	Redder Underlying Layer
Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Redox (A15) Alaska Redox (A15) Alaska Gleyed Pores (A15)	X Hydr	ogen Sulfide (A4)			Alaska Redo	x With 2.5	Y Hue		Other (Explain in Remarks)
Alaska Redox (A14) and an appropriate landscape position must be present. Alaska Gleyed Pores (A15) 4Give details of color change in Remarks. Restrictive Layer (if present): none encountered	Thick	Dark Surface (A1	2)						
Alaska Gleyed Pores (A15) Restrictive Layer (if present): none encountered Depth: * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable to get compared by the present? * 0-2" bgs organic surface layer with >50% roots with some sand (unable	Alask	ka Gleyed (A13)		3One	Indicator of h	ydrophytic	vegetation	, one primary indicato	r of wetland hydrology,
Restrictive Layer (if present): Depth: # 0-2* bgs organic surface layer with >50% roots with some sand (unable to get content of the position of the positio	Alask	ka Redox (A14)		and a	in appropriate	landscape	position n	nust be present.	
Pyprology Netland Hydrology Indicators: Primary Indicators (any one indicator is sufficient) Surface Water (A1) Surface Water (A1) Surface Water (A2) Saturation (A3) Sparsely Vegetated Concave Surface (B8) Water Table (A2) Inundations Visible on Aerial Imagery (B7) Sediment Deposits (B1) Federal Phydrogen Sulfide Odor (C1) Sediment Deposits (B2) Drift Deposits (B3) Other (Explain in Remarks) Teld Observations: Indicators (2 or more required) Water Stained Leaves (B9) Drainage Patterns (B10) Salt Deposits (C5) Oxidized Rhizospheres on Living Roots (includes a capital form of the presence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Shallow Aquitard (D3) Geomorphic Position (D2) Microtopographic Relief (D4) FAC-Neutral Test (D5) Feld Observations: Inface Water Present? Ves Depth (inches): Dept	Alask	ka Gleyed Pores (A	(15)	4Give	details of cold	or change	in Remarks		
Pyprology Netland Hydrology Indicators: Primary Indicators (any one indicator is sufficient) Surface Water (A1) Surface Water (A1) Surface Water (A2) Inundations Visible on Aerial Imagery (B7) Satturation (A3) Sparsely Vegetated Concave Surface (B8) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Mark (B4) Iron Deposits (B5) Field Observations: urface Water Table (Pasent? Ves Depth (inches): Depth	Restrictive	e Layer (if present)		accompanies and					
PYDROLOGY Notiand Hydrology Indicators: Primary Indicators (any one indicator is sufficient) Surface Water (A1)		a mente al come	none en	countered				Hydric Solls Pre	esent? Yes
VPDROLOGY Netland Hydrology Indicators: Secondary Indicators (2 or more required) Primary Indicators (any one indicator is sufficient) Water Stained Leaves (B9) Drainage Patterns (B10) Surface Water (A1) Surface Soil Cracks (B6) Drainage Patterns (B10) Salt Deposits (C5) Salt Depo									
Surface Water (A1)	marks:				* 0-2" b	gs organic	surface la	yer with >50% roots w	vith some sand (unable to get colo
High Water Table (A2)	marks:		s:		* 0-2" b	gs organic	surface la		
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Dry Season Water Table (C2) Drift Deposits (B3) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Field Observations: Inface Water Present? Wes Depth (inches): Depth (inches	marks: /DROLO /etland Hy	drology Indicator		fficient)_	* 0-2" b	gs organic	surface la	Secondary In	dicators (2 or more required)
Water Marks (B1)	marks: /DROLO /etland Hy-	drology Indicator cators (any one ind		- T. S. S. S. S. S.			surface la	Secondary In	dicators (2 or more required) ined Leaves (B9)
Sediment Deposits (B2) Dry Season Water Table (C2) Drift Deposits (B3) Other (Explain in Remarks) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Field Observations: Inface Water Present? Atter Table Present? Tyes Depth (inches):	POROLO Petland Hydrimary India Surface	drology Indicator cators (any one ind e Water (A1)		Surface S	oil Cracks (B6	3)		Secondary In Water Sta Drainage Salt Depo	dicators (2 or more required) ined Leaves (B9) Patterns (B10) osits (C5)
Sediment Deposits (B2) Dry Season Water Table (C2) Drift Deposits (B3) Other (Explain in Remarks) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) FAC-Neutral Test (D5) FIeld Observations: Inface Water Present? No Depth (inches): Atturation Present? Present. Present.	Marks: /DROLO /etland Hy rimary India Surface High W	drology Indicator cators (any one ind e Water (A1) Vater Table (A2)		Surface S Inundation	ioil Cracks (B6	3) erial Imag	ery (B7)	Secondary In Water Sta Drainage Salt Depo	dicators (2 or more required) ined Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C5)
Drift Deposits (B3) Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Cleid Observations: Irface Water Present? Atter Table Present? Yes Depth (inches):	/DROLO /etland Hydrimary India Surface X High W	drology Indicator cators (any one ind e Water (A1) Vater Table (A2) tion (A3)		Surface S Inundation Sparsely	soil Cracks (Be as Visible on A Vegetated Co	3) verial Imago ncave Surf	ery (B7)	Secondary In Water Sta Drainage Salt Depo Oxidized Presence	dicators (2 or more required) ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C3) of Reduced Iron (C4)
Mat of Crust of Algae or Marl (B4) Iron Deposits (B5) Field Observations: Irrace Water Present? Interpretation Presen	Marks: DROLO	drology Indicator cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1)		Surface S Inundation Sparsely Hydrogen	ioil Cracks (Be as Visible on A Vegetated Co a Sulfide Odor	6) erial Image ncave Surf (C1)	ery (B7)	Secondary In Water Sta Drainage Salt Depo Oxidized Presence	dicators (2 or more required) ined Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1)
Iron Deposits (B5) FAC-Neutral Test (D5) FIeld Observations: Inface Water Present? Infa	Marks: /DROLO /etland Hy rimary India Surface High W Satural Water Sedime	drology Indicator cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2)		Surface S Inundation Sparsely Hydrogen Dry Seas	ioil Cracks (Be as Visible on A Vegetated Co a Sulfide Odor on Water Tabl	s) verial Imago ncave Surf (C1) le (C2)	ery (B7)	Secondary In Water Sta Drainage Salt Depo Oxidized Presence Stunted of	dicators (2 or more required) ined Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3 of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3)
ater Table Present? Yes Depth (inches): Depth (inches)	Marks: /DROLO /etland Hydrimary India Surface High W Satural Water Sedime	drology Indicator cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3)	licator is su	Surface S Inundation Sparsely Hydrogen Dry Seas	ioil Cracks (Be as Visible on A Vegetated Co a Sulfide Odor on Water Tabl	s) verial Imago ncave Surf (C1) le (C2)	ery (B7)	Secondary In Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow A	dicators (2 or more required) ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2)
Auturation Present? Yes Depth (inches): Depth (inches)	/DROLO /etland Hydrimary India Surface High W Satural Water Sedime Drift De Mat of	drology Indicator cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or I	licator is su	Surface S Inundation Sparsely Hydrogen Dry Seas	ioil Cracks (Be as Visible on A Vegetated Co a Sulfide Odor on Water Tabl	s) verial Imago ncave Surf (C1) le (C2)	ery (B7)	Secondary In Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow A Geomorp	dicators (2 or more required) ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4)
ater Table Present? Yes Depth (inches): 6 Wetland Hydrology Present? Yes aturation Present? Yes Depth (inches): 0	Marks: /DROLO /etland Hydrimary India Surface High W Satural Water Sedime Drift De	drology Indicator cators (any one indicators water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or I	licator is su	Surface S Inundation Sparsely Hydrogen Dry Seas	ioil Cracks (Be as Visible on A Vegetated Co a Sulfide Odor on Water Tabl	s) verial Imago ncave Surf (C1) le (C2)	ery (B7)	Secondary In Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow A Geomorp	dicators (2 or more required) ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4)
aturation Present? Yes Depth (inches): 0 Includes capillary fringe)	Mat of Iron De	drology Indicator cators (any one ind e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or I eposits (B5)	licator is su	Surface S Inundation Sparsely Hydrogen Dry Seas	soil Cracks (Bé as Visible on A Vegetated Co a Sulfide Odor on Water Tabl splain in Rema	erial Imagencave Surf (C1) le (C2) arks)	ery (B7)	Secondary In Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow A Geomorp	dicators (2 or more required) ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4)
aturation Present? Yes	Marks: /DROLO /etland Hydrimary India Surface Water Sedima Drift Do Iron De	drology Indicator cators (any one indicators e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or I eposits (B5) vations: r Present?	licator is su	Surface S Inundation Sparsely Hydrogen Dry Seas	ioil Cracks (Be as Visible on A Vegetated Co a Sulfide Odor on Water Tabl splain in Rema	acrial Imagencave Surf (C1) (C2) arks)	ery (B7)	Secondary In Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow A Geomorp Microtopo FAC-Neu	dicators (2 or more required) ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) ohic Position (D2) ographic Relief (D4) otral Test (D5)
	Marks: /DROLO /etland Hydrimary India Surface Water Sedima Drift Do Iron De	drology Indicator cators (any one indicators e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or I eposits (B5) vations: r Present?	licator is su	Surface S Inundation Sparsely Hydrogen Dry Seas	soil Cracks (Be as Visible on A Vegetated Co a Sulfide Odor on Water Tabl splain in Rema Depth (ind	acial Imagencave Surf (C1) le (C2) arks)	ery (B7)	Secondary In Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow A Geomorp Microtopo FAC-Neu	dicators (2 or more required) ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) ohic Position (D2) ographic Relief (D4) otral Test (D5)
	Marks: PROLO Petland Hydrimary India Surface Water Sedime Drift Deliver Table Fearer Surface Water Sedime Liter Table Fearer Surface Water	drology Indicator cators (any one indicators e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or I eposits (B5) vations: r Present? esent?	Mari (B4)	Surface S Inundation Sparsely Hydrogen Dry Seas	soil Cracks (Be as Visible on A Vegetated Co a Sulfide Odor on Water Tabl splain in Rema Depth (ind	acial Imagencave Surf (C1) le (C2) arks)	ery (B7)	Secondary In Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow A Geomorp Microtopo FAC-Neu	dicators (2 or more required) ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) ohic Position (D2) ographic Relief (D4) otral Test (D5)
	DROLO Vetland Hydrimary India Surface Water Sedime Drift De Mat of Iron De Ield Observater Table F turation Precludes capi	drology Indicator cators (any one indicators e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or I eposits (B5) vations: r Present? esent? esent? elilary fringe)	No Yes	Surface S Inundation Sparsely Hydrogen Dry Seas Other (Ex	Soil Cracks (Be as Visible on A Vegetated Co a Sulfide Odor on Water Tabl splain in Rema Depth (ind Depth (ind	s) erial Image ncave Surf (C1) le (C2) arks) ches): ches):	ery (B7) face (B8)	Secondary In Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow Geomorp Microtopo FAC-Neu	dicators (2 or more required) ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C5) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) ohic Position (D2) ographic Relief (D4) otral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen	t Project Borough/C	ity:North Sl	ope			Sampling	Date	Aug 7, 2
Applicate/Owner: Brooks Range Peti	oleum	-				0		D 40
Investigator(s): JBrekken, JO'Brien	L	andform (hills	side, terrace	, Huumock, et	c: tussocks	Sampling	Point:	B-19
Local Relief (concave, convex, none):	flat	Slo	pe (%): 0					
Subregion:	Lat:		Long		Datum:			
Are climate/hydrologic conditions on the	e site typical for this tin	ne of year? Y	'es					
Are Vegetation?,No Soil? No	or Hydrocabon	? No	significantly	disturbed?	Are "Normal Cir	cumstances" Pre	sent?	Yes
Are Vegetation?,No Soil? No	or Hydrocabon	? No	naturally pr	oblematic?	(If needed, explain	any answers in Re	marks)	
SUMMARY OF FINDINGS - Attach sit	e map showing samp	pling point ic	ocations, tra	ansects, Imp	ortant features,	etc.		
Hydrophytic Vegetation Present?	Yes	is the S	Sampled Are	а				
Hydric Soils Present?	Yes	within a	Wetland?	Yes				
Wetland Hydrology Present?	Yes							
Remarks:								
VEGETATION (List all species	s in plot)							
Tree Stratum (Use scientific names)		Absolute	Dominant	200202-212	Dominance Tes	t worksheet:		
1.		%Cover	Species		Number of Domi That Are OBL, F		2	(A)
2					Total Number of		-	- 1.4
3.					Species Across	E Targetter Car	3	(B)
					Percent of Domi			
4.	This	Cover:			That Are OBL, F		66	(A/B)
Sampling/Shrub Stratum	50% of total cover:		of total cover:		Prevalence In	ndex: r of: Multiplied by		
1. Salix reticulata		3		FAC	OBL Species	11 x 1 =		
2. Dryas integrifolia		20	Yes	- C.	FACW Species		-	_
3. Salix rotundifolia		1		NI	FAC Species	27 x 3 =	81	=
4. Salix planifolia		2		FACW		23 x 4 =	92	
		3		E4011	UPL Species	0 x5=	0	—(B)
5. Cassiope tetragona 6.		3		EACO	Column Totals:	98 (A)	258	_
	Total	Cover: 29			Prevalence Inde	x = B/A = 2.63		
Herb Stratum	The second secon		of total cover:		Ud bdl V			
Pyrola grandiflora		2		EAC		egetation Indica e Test is >50%	ators.	
2. Vaccinium vitis-idaea		1		EAC		e Test is ≤3.0		
3. Eriophorum angustifolium		10		OBL		ical Adaptions' (P	rovide	
4. Saxifraga hirculus		1		OBL S		n Remarks or on		rate sheet)
5. Polygonum viviparum		1		EAC	Problemat	ic Hydrophytic Ve	getatio	n' Explain)
6. Carex saxatilis		25	Yes	FACIAL		dric soil and wetl		
7. Carex podocarpa		20	Yes	FAC	pe present unles	ss disturbed or pr	oblemic	<u>L</u>
			100					
8. Carex membranacea	444	_10 Cover: 70		FACW				
Plot size (radius, or length x width) 1	50% of total cover: 3 5' radius % E	Bare Ground:			lydrophytic Vege	etation Present?	1	/es
% Cover of Wetland Bryophytes:	Total	Cover of Bry	ophytes:	15				

Remarks: Small drainage channel to the west and larger stream located to the east.

0-2							Organics, >50% roots in soil
2-8							100% root fiber mat
						To Carrie and	- 1 OCASA GOVA DE TANDA ES
8-14 5 YR 2.5/1	100					loamy sand	<50% roots w/ sparse pea ac
1Type: C=Concentrations, D)=Depletions, RM	√l=Reduced	Matrix.	2Locat	on: PL=P	ore Linings, RC=Roo	ot Channel, M=Matrix
Hydric Soil Indicators:		Indicate	ors for Prol	blematic i	lydric Sol	l8s:	
Histosol or Histel (A1)			Naska Color	Change	TA4)4	Г	Alaska Gleyed Without Hue 5Y or
▼ Histic Epipedon (A2)			laska Alpin	e Swales	TA5)		Redder Underlying Layer
Hydrogen Sulfide (A4)		FA	laska Redo	x With 2.5	Y Hue	Г	Other (Explain in Remarks)
Thick Dark Surface (A1	2)						
Alaska Gleyed (A13)		3One In	dicator of hy	drophytic	vegetation	, one primary indica	tor of wetland hydrology,
Alaska Redox (A14)				- 11 - 1 - 1		nust be present.	
Alaska Gleyed Pores (A	(15)	4Give de	etails of cold	or change	in Remarks	S.	
Danisiativa Lavas (if assesse)	. Same					1 120 10 L 20 1	
Restrictive Layer (if present)	Trozen					Hudric Salle D	resent? Yes
Restrictive Layer (ii present)	frozen					Hydric Solls P	TOO TOO
Depth: 14" bgs	Trozen					nyunc sons P	
Depth: 14" bgs emarks: /DROLOGY /etland Hydrology Indicator	S:		_				Indicators (2 or more required)
Depth: 14" bgs marks: /DROLOGY /etland Hydrology Indicator rimary Indicators (any one inc	s:					Secondary Water S	Indicators (2 or more required) tained Leaves (B9)
Depth: 14" bgs emarks: /DROLOGY /etland Hydrology Indicator rimary Indicators (any one inc Surface Water (A1)	s: dicator is sufficie	Surface Soil		- T		Secondary Water S Drainag	Indicators (2 or more required) tained Leaves (B9) pe Pattems (B10)
Depth: 14" bgs Properties of the second of	s:	Surface Soil	Visible on A	erial Imag		Secondary Water S Drainag Salt De	Indicators (2 or more required) tained Leaves (B9) ge Pattems (B10) posits (C5)
Depth: 14" bgs Proceedings of the second of	s: licator is sufficie	Surface Soil nundations \ Sparsely Ve	Visible on A	erial Imag ncave Sur		Secondary Water S Drainag Salt De Oxidize	Indicators (2 or more required) tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C
Depth: 14" bgs Proceedings of the second of	s: dicator is sufficie	Surface Soil nundations \ Sparsely Ve Hydrogen S	Visible on A getated Cor ulfide Odor	erial Imag ncave Sur (C1)		Secondary Water S Drainag Salt De Oxidize Presen	Indicators (2 or more required) tained Leaves (B9) ge Pattems (B10) posits (C5)
Depth: 14" bgs Property Semarks: Property Settland Hydrology Indicator (any one incoming Indicators (any one incoming Indicators (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	s: dicator is sufficie	Surface Soil nundations \ Sparsely Ve Hydrogen S Dry Season	Visible on A getated Cor ulfide Odor Water Table	erial Imag ncave Sur (C1) e (C2)		Secondary Water S Drainag Salt De Oxidize Presen Stunted	Indicators (2 or more required) tained Leaves (B9) pe Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ca
Depth: 14" bgs Property of the state of the	s: Sicator is sufficie	Surface Soil nundations \ Sparsely Ve Hydrogen S	Visible on A getated Cor ulfide Odor Water Table	erial Imag ncave Sur (C1) e (C2)		Secondary Water S Drainag Salt De Oxidize Presen Stunted Shallow Geomo	Indicators (2 or more required) tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) rphic Position (D2)
Depth: 14" bgs Proceedings of the second of	s: Sicator is sufficie	Surface Soil nundations \ Sparsely Ve Hydrogen S Dry Season	Visible on A getated Cor ulfide Odor Water Table	erial Imag ncave Sur (C1) e (C2)		Secondary Water S Drainag Salt De Oxidize Presen Stunted Shallow Geomo	Indicators (2 or more required) tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) rphic Position (D2) pographic Relief (D4)
Depth: 14" bgs Property of the state of the	s: Sicator is sufficie	Surface Soil nundations \ Sparsely Ve Hydrogen S Dry Season	Visible on A getated Cor ulfide Odor Water Table	erial Imag ncave Sur (C1) e (C2)		Secondary Water S Drainag Salt De Oxidize Presen Stunted Shallow Geomo	Indicators (2 or more required) tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) rphic Position (D2)
Depth: 14" bgs Proceedings of the second of	s: Sicator is sufficie	Surface Soil nundations \ Sparsely Ve Hydrogen S Dry Season	Visible on A getated Cor ulfide Odor Water Table	erial Imag ncave Sur (C1) e (C2)		Secondary Water S Drainag Salt De Oxidize Presen Stunted Shallow Geomo	Indicators (2 or more required) tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) rphic Position (D2) pographic Relief (D4)
Depth: 14" bgs Property Indicators (any one incoming Indicators (any one incoming Indicators (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Iron Deposits (B5)	s: Sicator is sufficie	Surface Soil nundations \ Sparsely Ve Hydrogen S Dry Season	Visible on A getated Cor ulfide Odor Water Table	erial Imag ncave Sur (C1) e (C2) rrks)		Secondary Water S Drainag Salt De Oxidize Presen Stunted Shallow Geomo	Indicators (2 or more required) tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) rphic Position (D2) pographic Relief (D4)
Depth: 14" bgs Proposition (A2) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or I Iron Deposits (B5)	s: Sicator is sufficie	Surface Soil nundations \ Sparsely Ve Hydrogen S Dry Season	Visible on A getated Cor ulfide Odor Water Tabl ain in Rema	erial Imag ncave Sur (C1) e (C2) rks)		Secondary Water S Drainag Salt De Oxidize Presen Stunted Shallow Geomo Microto FAC-No	Indicators (2 or more required) tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) rphic Position (D2) pographic Relief (D4)
Depth: 14" bgs Property Indicators (any one incoming Indicators (any one	s: Sicator is sufficie Sicat	Surface Soil nundations \ Sparsely Ve Hydrogen S Dry Season	Visible on A getated Cor ulfide Odor Water Tabla ain in Rema	erial Imag ncave Sur (C1) e (C2) rks)		Secondary Water S Drainag Salt De Oxidize Presen Stunted Shallow Geomo Microto FAC-No	Indicators (2 or more required) tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) propic Position (D2) pographic Relief (D4) eutral Test (D5)
Depth: 14" bgs Property Indicators (any one incoming Indicators (any one	S: dicator is sufficie	Surface Soil nundations \ Sparsely Ve Hydrogen S Dry Season Other (Expla	Visible on A getated Cor ulfide Odor Water Table ain in Rema Depth (inc	erial Imag ncave Sur (C1) e (C2) rks) ches):	Pace (B8)	Secondary Water S Drainag Salt De Oxidize Presen Stunted Shallow Geomo Microto FAC-No	Indicators (2 or more required) tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Ci ce of Reduced Iron (C4) d or Stressed Plants (D1) v Aquitard (D3) propic Position (D2) pographic Relief (D4) eutral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen	t Project Borough	n/City:North	lope			Sampling	Date	Aug 7, 2
Applicate/Owner: Brooks Range Petr	oleum							0.500
Investigator(s): JBrekken, JO'Brien		Landform (hi	llside, terrace	, Huumock, e	tc: tussocks	Sampling	g Point:	B-20
Local Relief (concave, convex, none):	flat	S	lope (%): <	1				
Subregion:	1	_at:	Long	2	Datum:			
Are climate/hydrologic conditions on the	site typical for this	time of year?	Yes					
Are Vegetation?,No Soil? No	or Hydrocab	on? No	significantl	y disturbed?	Are "Normal Cir	rcumstances" Pr	esent?	Yes
Are Vegetation?, No Soil? No	or Hydrocab	on? No	naturally p	roblematic?	(If needed, explain	n any answers in R	emarks)	
SUMMARY OF FINDINGS - Attach sit	e map showing sa	tniog point	locations, tr	ansects, Imp	ortant features.	etc.		
Hydrophytic Vegetation Present?	Yes	Is the	Sampled Are	a				
Hydric Soils Present?	Yes	within	a Wetland?	Yes				
Wetland Hydrology Present?	Yes							
Remarks:								
/EGETATION (List all species	in plot)		7.0					
Tree Stratum (Use scientific names)		Absolut	e Dominant Species	Indicator Status	Dominance Tes			
1.		ACOVE	- MEMES	Signa .	Number of Dom That Are OBL, F		3	(A)
2.					Total Number of		-	- 4.4
3.					Species Across	- A. C. St. Tan. (14)	4	(B)
4.					Percent of Domi That Are OBL, F		75	(A/B)
C. Company of Annual Company	To	otal Cover:		-	Prevalence I		-	. (/42)
Sampling/Shrub Stratum	50% of total cover:	209	6 of total cover			r of: Multiplied by	<i>r</i> :	
Salix reticulata		4		FAC	OBL Species	16 x 1 =	16	2
2. Dryas integrifolia		40	Yes	FACU	FACW Species	30 x 2 =	60	
3. Salix rotundifolia		1		NI	FAC Species	23 x 3 =	69	
4. Salix arctica		3		FAC	FACU Species UPL Species	45 x 4 = x 5 =	180	-
5. Cassiope tetragona		5		FACU	Column Totals:	*	325	(B)
6.						—"	-	-
	To	otal Cover: 53			Prevalence Inde	ex = B/A = 2.8	5	
Herb Stratum	50% of total cover:	26.5 209	6 of total cover	10.6	RALARONA	o Cart Sax	62.1.10	
Eriophorum angustifolium		15	Yes	OBL		egetation indic	ators:	
2. Saxifraga hirculus		1		OBL		e Test is >50% e Test is ≤3.0		
3. Saussurea angustifolia		1		FAC	The state of the state of	ical Adaptions' (Provide	
4. Carex bigelowii		15	Yes			n Remarks or on		rate sheet)
5. Carex membranacea		30	Yes	FACW	Problemat	ic Hydrophytic V	egetatio	n' Explain)
		22	169	LASH		dric soil and we		
6.					be present unles	ss disturbed or p	roblemic	5.
7.							_	
8.								
	50% of total cover:	otal Cover: 62 31 209	6 of total cover	12.4	-lydrophytic Veg	etation Present?	L	'es
Plot size (radius, or length x width) 15	Classifi on	% Bare Ground		- 25	Tarobilling Acti	Canon ricocilly	1,	E-5
% Cover of Wetland Bryophytes:	То	tal Cover of Bi	yophytes:	10				

Sampling Point:

Depth Matrix (Inches) Color (moist)		th needed ox Feature: or (moist)		Types	Locz	Texture Remarks	Remarks
0-2							Organics/soil mix
2-7					-		100% root fiber mat
7-10 5 YR 2.5/1	100					sandy loam	<50% roots w/ some small or
10-15 2.5 Y 2.5/1	100					sandy loam	<50% roots in soil matrix
1Type: C=Concentrations, D=	Depletions, RM	∕I=Reduced	Matrix.	2Locati	on: PL=P	ore Linings, RC=Root	Channel, M=Matrix
Hydric Soll Indicators:		Indicat	ors for Pro	blematic H	lydric Sol	ls:	
Histosol or Histel (A1)		П	Alaska Colo	Change (TA4)4	Г	Alaska Gleyed Without Hue 5Y or
☐ Histic Epipedon (A2)			Alaska Alpin		235/4		Redder Underlying Layer
Hydrogen Sulfide (A4)			Alaska Redo		1000		Other (Explain in Remarks)
Thick Dark Surface (A12)							
Alaska Gleyed (A13)		3One In	dicator of h	ydrophytic	vegetation	, one primary indicate	or of wetland hydrology,
Alaska Redox (A14)					Maria Santa	nust be present.	College College & Louis See
Alaska Gleyed Pores (A1	5)		etails of col			2,	
Restrictive Layer (if present):						200000000000000000000000000000000000000	room Alban
	rrozen					Hydric Solls Pr	esent? Yes
Depth: 15" bgs							-
emarks:							
Primary Indicators (any one indicators: Surface Water (A1) High Water Table (A2)		Surface Soi nundations	il Cracks (Be	erial Image	150 25 50	Water Sta	idicators (2 or more required) ined Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3
POROLOGY Wetland Hydrology Indicators: Primary Indicators (any one indicators (any one indicators) Surface Water (A1) High Water Table (A2) Saturation (A3)		Surface Soi nundations Sparsely Ve	Visible on A	erial Image ncave Surf	150 25 50	Water Sta Drainage Salt Dep Oxidized	nined Leaves (B9) Patterns (B10) osits (C5)
Primary Indicators: Primary Indicators (any one indic Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)		Surface Soi nundations Sparsely Ve Hydrogen S	Visible on A egetated Co Sulfide Odor	erial Image ncave Surf (C1)	150 25 50	Water Sta Drainage Salt Dep Oxidized Presence Stunted	ined Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) or Stressed Plants (D1)
Primary Indicators (any one indicators: Primary Indicators (any one indicators (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)		Surface Soinundations Sparsely Ve Hydrogen S Dry Season	Visible on A egetated Co Sulfide Odor Water Tab	verial Image ncave Surf (C1) le (C2)	150 25 50	Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow	pined Leaves (B9) Patterns (B10) Posits (C5) Rhizospheres on Living Roots (C3) Posits (C4) Position (C4) Position (C4) Position (C4) Position (C5) Position (C5) Position (C6) Position
Print Deposits (B3)		Surface Soinundations Sparsely Ve Hydrogen S Dry Season	Visible on A egetated Co Sulfide Odor	verial Image ncave Surf (C1) le (C2)	150 25 50	Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomory	plined Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) ohic Position (D2)
Property Pro		Surface Soinundations Sparsely Ve Hydrogen S Dry Season	Visible on A egetated Co Sulfide Odor Water Tab	verial Image ncave Surf (C1) le (C2)	150 25 50	Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop	plined Leaves (B9) Patterns (B10) Patterns (B10) Patterns (C5) Rhizospheres on Living Roots (C5) Patterns (C4) Patterns (D4) Patterns (D4) Patterns (D3) Patterns (D3) Patterns (D4) Patterns (D4) Patterns (D4) Patterns (D4) Patterns (B10) Patterns
Print Deposits (B3)		Surface Soinundations Sparsely Ve Hydrogen S Dry Season	Visible on A egetated Co Sulfide Odor Water Tab	verial Image ncave Surf (C1) le (C2)	150 25 50	Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop	plined Leaves (B9) Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3) of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) ohic Position (D2)
Property Pro		Surface Soinundations Sparsely Ve Hydrogen S Dry Season	Visible on A egetated Co Sulfide Odor n Water Tabl lain in Rema	nerial Image ncave Surf (C1) le (C2) arks)	150 25 50	Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop	plined Leaves (B9) Patterns (B10) Patterns (B10) Patterns (C5) Rhizospheres on Living Roots (C5) Patterns (C4) Patterns (D4) Patterns (D4) Patterns (D3) Patterns (D3) Patterns (D4) Patterns (D4) Patterns (D4) Patterns (D4) Patterns (B10) Patterns
Primary Indicators (any one indicators: Primary Indicators (any one indicators (any one indicators (any one indicators) Surface Water (A1) High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Mail Iron Deposits (B5)		Surface Soinundations Sparsely Ve Hydrogen S Dry Season	Visible on A egetated Co Sulfide Odor Water Tab	nerial Image ncave Surf (C1) le (C2) arks)	150 25 50	Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop	plined Leaves (B9) Patterns (B10) Patterns (B10) Patterns (C5) Rhizospheres on Living Roots (C5) Patterns (C4) Patterns (D4) Patterns (D4) Patterns (D3) Patterns (D3) Patterns (D4) Patterns (D4) Patterns (D4) Patterns (D4) Patterns (B10) Patterns
Properties Proper	IT (B4)	Surface Soinundations Sparsely Ve Hydrogen S Dry Season	Visible on A egetated Co Sulfide Odor n Water Tabl lain in Rema	nerial Image ncave Surf (C1) le (C2) arks)	150 25 50	Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop FAC-Net	plined Leaves (B9) Patterns (B10) Patterns (B10) Patterns (C5) Rhizospheres on Living Roots (C5) Patterns (C4) Patterns (D4) Patterns (D4) Patterns (D3) Patterns (D3) Patterns (D4) Patterns (D4) Patterns (D4) Patterns (D4) Patterns (B10) Patterns
Primary Indicators (any one indicators: Primary Indicators (any one indicators (any one indicators) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Mater (B4) Iron Deposits (B5) Primary Indicators: Iron Deposits (B5) Primary Indicators (any one indicators: Iron Deposits (B5) Primary Indicators (Indicators) Indicators (Indic	IT (B4)	Surface Soinundations Sparsely Ve Hydrogen S Dry Season	Visible on A agetated Co Sulfide Odor n Water Tabl lain in Rema	erial Image ncave Surf (C1) le (C2) arks) ches):	150 25 50	Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop FAC-Net	pined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C3) pof Reduced Iron (C4) por Stressed Plants (D1) Aquitard (D3) polic Position (D2) pographic Relief (D4) putral Test (D5)
Primary Indicators (any one indicators: Primary Indicators (any one indicators (any one indicators) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Mater (B4) Iron Deposits (B5) Pleid Observations: Irface Water Present?	No No Yes	Surface Soinundations Sparsely Ve Hydrogen S Ory Season Other (Expl	Visible on A agetated Co Sulfide Odor Nater Tabl lain in Rema Depth (inc Depth (inc	ches):	0	Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop FAC-Net	pined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C3) pof Reduced Iron (C4) por Stressed Plants (D1) Aquitard (D3) polic Position (D2) pographic Relief (D4) putral Test (D5)
Proposits (B3) Mat of Crust of Algae or Mater Table Present? Teledo Observations: Triace Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Mater Marks (B5)	No No Yes	Surface Soinundations Sparsely Ve Hydrogen S Ory Season Other (Expl	Visible on A agetated Co Sulfide Odor Nater Tabl lain in Rema Depth (inc Depth (inc	ches):	0	Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop FAC-Net	pined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C3) pof Reduced Iron (C4) por Stressed Plants (D1) Aquitard (D3) polic Position (D2) pographic Relief (D4) putral Test (D5)
POROLOGY Vetland Hydrology Indicators: rimary Indicators (any one indic Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Mat of Crust of Algae or Malron Deposits (B5) Ield Observations: rface Water Present? atter Table Present? turation Present?	No No Yes	Surface Soinundations Sparsely Ve Hydrogen S Ory Season Other (Expl	Visible on A agetated Co Sulfide Odor Nater Tabl lain in Rema Depth (inc Depth (inc	ches):	0	Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop FAC-Net	pined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (C3) pof Reduced Iron (C4) por Stressed Plants (D1) Aquitard (D3) polic Position (D2) pographic Relief (D4) putral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developn	nent Project Borough/C	ity:North	Slope			Sampling Date	Aug 7, 20
Applicate/Owner: Brooks Range F	Petroleum		3.0			Sampling Point	B-21
Investigator(s): JBrekken, JO'Brie	n L	andform (h	illside, tеггас	e, Huumock, e	tc: tussocks	Sampling Form	. 521
Local Relief (concave, convex, non	e): concave	_ 8	Slope (%): <	<1			
Subregion:	Lat		Lon	g:	Datum:		
Are climate/hydrologic conditions or	n the site typical for this tir	me of year?	Yes				
Are Vegetation?, No Soil? N	lo or Hydrocabon	? No	significant	ly disturbed?	Are "Normal Circui	mstances" Present?	Yes
Are Vegetation?, No Soil? N	lo or Hydrocabon	? No	naturally p	problematic?	(If needed, explain an	y answers in Remarks	
SUMMARY OF FINDINGS - Attach	site map showing sam	pling point	locations, t	ransects, Imp	ortant features, et	c.	
Hydrophytic Vegetation Present?	Yes		Sampled Ar				
Hydric Soils Present?	Yes	Within	a Wetland?	Yes			
Wetland Hydrology Present?	Yes						
Remarks:							
VEGETATION (List all spec	cles in plot)						
Tree Stratum (Use scientific nam	nes)	Absolut %Cove	e Dominant r Species	Indicator Status	Dominance Test v		
1.			· ctime		Number of Domina That Are OBL, FAC	W, or FAC: 2	(A)
2.					Total Number of Do	ominant	700
3.					Species Across All	Strata: 2	(B)
4.					Percent of Dominar That Are OBL, FAC		(A/B)
Total San	Total	Cover:			Prevalence Inde	The same of the sa	
Sampling/Shrub Stratum	50% of total cover:	20	% of total cove	- 1 - A - A - A - A	Total % Cover of	54 84 X 17 17 4	
1. Salix planifolia		1		FACW	OBL Species 25	x 1 = 25	
2. Salix ovalifolia		2		FAC	FACW Species 76	x 2 = 152	
3. Salix rotundifolia		1		NI	FAC Species 3	x 3 = 9	_
4.					FACU Species 0	x4= 0 x5= 0	_
5.					Column Totals: 10		(B)
6.							-
	Total	Cover: (tre	at w/ herb stra	trim),	Prevalence Index =	B/A = 1.79	
Herb Stratum	50% of total cover:	209	% of total cover		Hydrophytic Von	etation Indicators:	
Eriophorum vaginatum		40	Yes	FACW	Dominance T		
2. Carex aquatilis		25	Yes	OBL	Prevalence T		
3. Dupontia fischeri		15		FACW	☐ Morphologica	Adaptions' (Provide	
4. Carex saxatilis		20		FACW	supporting data in R	emarks or on a sper	rerate sheet)
5. Polygonum viviparum		1		EAC	Problematic H	lydrophytic Vegetati	on' Explain)
6.				110		c soil and wetland h	
7					De present uniess (disturbed or problem	16.
				+			
8.	Trial	Cover: 105	5				
and to the second second	50% of total cover:		% of total cover	r: 21	Hydrophytic Vegetal	tion Present?	Yes
Plot size (radius, or length x widt	100	Bare Groun	7		1		
% Cover of Wetland Bryophytes:	Total	Cover of B	ryopnytes:	5			

US Army Corps of Engineers

Remarks: Sapling/shrub stratum treated with herb stratum.

0-6 6-10 10-20	10 YR 3/2				% Ty	pe ₁	Loc ₂	Texture Remarks	Remarks
3.000		100						loam	>50% roots/organics in soil m
10-20	5 Y 3/1	100						sandy loam	<50% roots/organics w/ small
	5 Y 4/1	100						sandy loam	<50% roots/organics w/ small
Type: C=0	Concentrations, D	=Depletion	ns, RM=Reduc	ed Matrix.	21.0	ocatio	n: PL=Po	ore Linings, RC=Root	Channel, M=Matrix
Hydric Sol	I Indicators:		indic	ators for	Problema	tic Hy	dric Soll	ls:	The state of the s
X Histos	ol or Histel (A1)			Alaska (Color Chan	ige (T	A4)4	i C	Alaska Gleyed Without Hue 5Y or
Histic	Epipedon (A2)			Alaska /	Alpine Swa	les (T	A5)		Redder Underlying Layer
X Hydro	gen Sulfide (A4)		10	Alaska F	Redox With	2.5Y	Hue	Г	Other (Explain in Remarks)
Thick !	Dark Surface (A1	2)							
T Alaska	Gleyed (A13)		3One	Indicator	of hydroph	ytic v	egetation	, one primary indicato	or of wetland hydrology,
Alaska	Redox (A14)		and a	an appropr	riate lands	cape p	osition m	nust be present.	
Alaska	Gleyed Pores (A	15)	4Give	details of	color char	nge in	Remarks	s.	
Restrictive	Layer (if present)	none en	countered					Hydric Solls Pro	esent? Yes
							_	nyunc sons Pri	Badurt 102
Depth:		-							-
DROLOG etland Hyd	GY rology Indicator	s:						Secondary In	dicators (2 or more required)
rimary Indica	ators (any one ind	licator is si	ufficient)		_			Water Sta	ined Leaves (B9)
Surface	Water (A1)		Surface S	Soil Cracks	s (B6)				Pattems (B10)
	ater Table (A2)				on Aerial I		4 4 4		osits (C5)
Saturation	on (A3)		Sparsely	Vegetated	Concave	Surfa	œ (B8)	A Secretary of the second of t	Rhizospheres on Living Roots (C e of Reduced Iron (C4)
- Water N	Marks (B1)		Hydroger	Sulfide C	Odor (C1)			And the second s	or Stressed Plants (D1)
	nt Deposits (B2)				Table (C2)	Ĺ			Aquitard (D3)
	posits (B3)		Other (E	xplain in R	lemarks)			Geomor	phic Position (D2)
	Crust of Algae or I	Marl (B4)							ographic Relief (D4)
Iron De	posits (B5)							FAC-Net	utral Test (D5)
leld Observ	ations:								
dana 18/4444	Present?	No		Depth	(inches):				
race vvater	resent?	Yes		Depti	n (inches):	8	3	Wetland Hydr	ology Present? Yes
iter Table Pr				Depth	n (inches):		_		
iter Table Pr		Yes						and the second	
iter Table Pr turation Pres cludes capill				l, aerial ph	notos, prev	ious i	nspection	ns), if available:	
iter Table Pr turation Pres cludes capill	lary fringe)			l, aerial pi	notos, prev	ious i	nspection	ns), if available:	

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen Applicate/Owner: Brooks Range Petr		y.1101111 511	opc .	-		Sampling Date	Aug 7, 2
Investigator(s): JBrekken, JO'Brien		ndform /hille	ida tamas	. Museum and a	tc: tussocks	Sampling Point:	B-22
Local Relief (concave, convex, none):	concave		pe (%): <	e, Huumock, e 1	ite: tussocks		
Subregion:	Lat:	510	Long		Datum:		
Are climate/hydrologic conditions on the		a af waar? V	_				
	e site typical for this tim	e or year? T		A Allerta Maria			
Are Vegetation?,No Soil? No	or Hydrocabon?	No		y disturbed?	1.36 . 121	mstances" Present? ny answers in Remarks)	Yes
Are Vegetation?, No Soil? No	or Hydrocabon?	No	naturally p	roblematic?	(II Illoudou, explain a	ny anawora in Normana)	
SUMMARY OF FINDINGS - Attach sit	e map showing samp				ortant features, e	tc.	
Hydrophytic Vegetation Present?	Yes		ampled And Wetland?				
Hydric Soils Present?	Yes		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
Wetland Hydrology Present?	Yes						
Remarks:							
/EGETATION (List all species	s in plot)						
Tree Stratum (Use scientific names)		Absolute %Cover	Dominant Species	Indicator Status	Dominance Test	worksheet:	
1.		70COVET	opedes	Status	Number of Domina That Are OBL, FAC		(A)
2.				1	Total Number of D		_ "
3.					Species Across All		(B)
					Percent of Domina		
4.	Total (- Contract			That Are OBL, FA	100	(A/B)
Sampling/Shrub Stratum	50% of total cover.		of total cover	n)	Prevalence Ind		
1. Salix reticulata		2		FAC	Total % Cover of OBL Species 67		-6
2. Salix planifolia		1		FACW	FACW Species 10		_
3. Dryas integrifolia		10	Yes	FACU	FAC Species 4	x 3 = 12	
4.			177		FACU Species 10	x 4 = 40	
					UPL Species 0	x 5 = 0	(B)
5. 6.					Column Totals: 91	(A) 139	
	Total (Cover: 13			Prevalence Index	= B/A = 1.53	
Herb Stratum	50% of total cover: 6.		of total cover	: 2.6			
Eriophorum angustifolium		50	Yes	OBL	Hydrophytic Veg	etation indicators:	
		15	144	OBL	Dominance 1		
2. Carex aquatilis				100	Prevalence 1		
3. Carex saxatilis		5		FACW		al Adaptions' (Provide	
4. Polygonum viviparum		2		EAC		Remarks or on a spen Hydrophytic Vegetatio	
5. Pedicularis sudetica		1		FACW			
6. Carex capillaris		3		FACW		ic soil and wetland hy disturbed or problemi	
7. Juncus biglumus		2		OBL			
8.							
Plot size (radius, or length x width) 1. % Cover of Wetland Bryophytes:				5 15.6	Hydrophytic Vegeta	tion Present?	Yes

US Army Corps of Engineers

Remarks: Sapling/shrub stratum treated with herb stratum.

Sampling Point:

(Inches)	Color (moist)						Texture Remarks	
0-2								Organics
2-9	7,5 YR 2.5/1	100					sandy loam*	80-90% fibrous root mat w/ st
9-14	2.5 YR 2.5/1	100					loam	<50% roots/organics
Hydric So Histor Hydro Thick Alask Alask	=Concentrations, E coll Indicators: sol or Histel (A1) Epipedon (A2) ogen Sulfide (A4) Control Surface (A1) Ka Gleyed (A13) Ka Redox (A14) Ka Gleyed Pores (A14) La Layer (if present)	2) A15)	Indic	Alaska Col Alaska Alp Alaska Rec Indicator of an appropriat	oblemation or Change ine Swale dox With 2 hydrophylae landsca	e (TA4)4 s (TA5) 2.5Y Hue	one primary indicate	t Channel, M=Matrix Alaska Gleyed Without Hue 5Y or Redder Underlying Layer Other (Explain in Remarks) or of wetland hydrology,
Depth:	14" bgs							
emarks:	2.40 -0-2			* soil	texture tes	st not conclus	ve due to high % of	root fibers - sandy loam or possible
emarks:	GY			* soil	texture tes	st not conclus	40.30	
emarks: YDROLO Wetland Hyd	GY drology Indicator		ficient)	* soil	texture tes	st not conclus	Secondary In	ndicators (2 or more required)
Primary Indic	GY	dicator is sur [[[[[Surface S Inundation Sparsely Hydroger Dry Seas	* soil factor (Factor) Soil Cracks (Factor	36) Aerial Ima oncave S or (C1) ble (C2)	agery (B7)	Secondary In Water Sta Drainage Salt Dep Oxidized Presence Stunted Shallow Geomor	
Primary Indic	drology Indicator cators (any one inc e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or le eposits (B5)	dicator is sur [[[[[Surface S Inundation Sparsely Hydroger Dry Seas	Soil Cracks (Fins Visible on Vegetated Con Sulfide Oddon Water Taxplain in Rem	Aerial Ima concave S or (C1) ble (C2) narks)	agery (B7) urface (B8)	Secondary Ir Water Str Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ndicators (2 or more required) ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Coe of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) autral Test (D5)
Primary Indice Surface Water I Sedime Drift De Iron De	drology Indicator cators (any one ince Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or leposits (B5) vations: r Present?	dicator is sur	Surface S Inundation Sparsely Hydroger Dry Seas	Soil Cracks (Ens Visible on Vegetated Con Sulfide Odd on Water Taxxplain in Rem	Aerial Ima concave S or (C1) ble (C2) narks)	agery (B7)	Secondary Ir Water Str Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ndicators (2 or more required) ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (Coe of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4)

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen	The second secon	ty:North SI	ope			Sampling	Date	Aug 8, 2
Applicate/Owner: Brooks Range Pet	roleum					Sampling	Point:	B-23
Investigator(s): JBrekken, JO'Brien				, Huumock, e	tc: tussocks			3,77
Local Relief (concave, convex, none):	none	Sic	ope (%): <		-2			
Subregion:	Lat:	- TO / TO A	Long		Datum:			
Are climate/hydrologic conditions on th	e site typical for this tim	e of year? Y	es					
Are Vegetation?,No Soil? No	or Hydrocabon?	No	significantly	disturbed?	Are "Normal Circ			Yes
Are Vegetation?, No Soil? No	or Hydrocabon?	No	naturally pr	oblematic?	(If needed, explain	any answers in Re	marks)	
SUMMARY OF FINDINGS - Attach sit	te map showing samp	ling point k	ocations, tra	ansects, imp	ortant features,	etc.		
Hydrophytic Vegetation Present?	Yes		Sampled Are Wetland?	a Yes				
Hydric Soils Present?	Yes	within	a vveiland;	103				
Wetland Hydrology Present?	Yes							
Remarks:								
VEGETATION (List all specie	s in plot)							
Tree Stratum (Use scientific names)	Absolute %Cover	and the state of t	Indicator Status	Dominance Test			
1.			-	2007	Number of Domin That Are OBL, FA		1	(A)
2.					Total Number of	Dominant		
3.				-	Species Across A	All Strata:	3	(B)
4.					Percent of Domin		33	(A/B)
	Total	Cover:		-	Prevalence in			- (/45)
Sampling/Shrub Stratum	50% of total cover:	20%	of total cover:			of: Multiplied by:		
1. Salix arctica		2		FAC	OBL Species	x1=	0	
2. Salix planifolia		2		FACW	FACW Species		144	_
3. Dryas integrifolia		15	Yes	LUCO			80	_
4. Salix glauca		1		FAC	UPL Species		0	-
5. Cassiope tetragona		5	Yes	FACU	Column Totals:		251	(B)
6.				- 1				
	Total (2	Prevalence Index	c = B/A = 2.49		
Herb Stratum	50% of total cover: 12	2.5 20%	of total cover:	5	Hydrophytic Ve	notation Indian	· • • • • • • • • • • • • • • • • • • •	
1. Eriophorum vaginatum		60	Yes	EACW	'프라마티 다 보다	Test is >50%	itors.	
2. Vaccinium vitis-idaea		3		FAC		Test is ≤3.0		
3. Carex saxatilis		10		FACW		cal Adaptions' (P	rovide	
4. Polygonum bistorta		2		FAC S	supporting data in	Remarks or on a	a spere	rate sheet)
5. Pyrola grandiflora		1		EAC	Problematic	Hydrophytic Ve	getation	n' Explain)
6.		77			'Indicators of hyd			
					be present unles	s alsturbea or pro	DOIEMIC	2
Z.				-	_			
8.	Total (Cover: 76						
	50% of total cover: 38		of total cover:	15.2	Hydrophytic Vege	tation Present?	Ty	'es
Plot size (radius, or length x width) 1		are Ground:		2	W-14-14-14-14-14-14-14-14-14-14-14-14-14-		T.	10
% Cover of Wetland Bryophytes:	Total	Cover of Bry	ophytes:	5				

Remarks: White crustose lichens on boils.

Sampling Point:

	Color (moist)	%	Color (moist)	%	Type ₁	LOC2	Texture Remarks	Remarks
0-3								Organics
3-7	2.5 YR 2.5/1	100					silty clay loam	Organics/soil mix w/ <50% ro
7-10	5 YR 2.5/1	100					silt loam	Organics/soil mix w/ <50% rg
1Type: C	=Concentrations, D	=Depletions	, RM=Reduc	ed Matrix.	2Locat	ion: PL=Po	ore Linings, RC=Root	Channel, M=Matrix
Hydric Se	oli indicators:		Indic	ators for Pro	blematic I	lydric Soll	S3;	
X Histo	sol or Histel (A1)		Г	Alaska Colo	Change (TA4)4	Г	Alaska Gleyed Without Hue 5Y or
Histic	Epipedon (A2)		Г	Alaska Alpin	e Swales	(TA5)		Redder Underlying Layer
☐ Hydr	ogen Sulfide (A4)			Alaska Redo	x With 2.5	Y Hue		Other (Explain in Remarks)
Thick	k Dark Surface (A1	2)						
T Alasi	ka Gleyed (A13)		3One	Indicator of hy	drophytic	vegetation	one primary indicate	or of wetland hydrology,
T Alasi	ka Redox (A14)		and a	n appropriate	landscape	position m	nust be present.	
Alasi	ka Gleyed Pores (A	15)	4Give	details of cold	or change	in Remarks		
Restrictive	e Layer (if present)	frozen					dans of a back	
		Trozen					Hydric Solls Pr	esent? Yes
Depth:	10" bgs							
DROLO etland Hy	GY drology indicator	5:					Secondary Ir	ndicators (2 or more required)
imanı Indi			icient)					
mary mu	cators (any one ind	icator is suff	0,0,1,1	-200			☐ Water Sta	ained Leaves (B9)
	cators (any one ind we Water (A1)	icator is suff		oil Cracks (Be	i)	-		ained Leaves (B9) Patterns (B10)
Surfac	2.3.1	icator is suff	Surface S	ioil Cracks (Be	interest and	ery (B7)	☐ Drainage ☐ Salt Dep	Patterns (B10) osits (C5)
Surfac High V	e Water (A1)	icator is suff	Surface S Inundation		erial Imag		☐ Drainage ☐ Salt Dep ☐ Oxidized	e Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3
Surfac High V	e Water (A1) Vater Table (A2)	icator is suff	Surface S Inundation Sparsely	s Visible on A	erial Imag ncave Sur		Drainage Salt Dep Oxidized Presence	e Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3 e of Reduced Iron (C4)
Surface High V Satura Water	e Water (A1) Vater Table (A2) tion (A3)	icator is suff	Surface S Inundation Sparsely Hydrogen	s Visible on A Vegetated Co	erial Imag ncave Sur (C1)		Drainage Salt Dep Oxidized Presenc Stunted	e Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3 e of Reduced Iron (C4) or Stressed Plants (D1)
Surface High V Satura Water Sedim	e Water (A1) Vater Table (A2) tion (A3) Marks (B1)	icator is suff	Surface S Inundation Sparsely Hydrogen Dry Seas	s Visible on A Vegetated Co Sulfide Odor	erial Imag ncave Sur (C1) e (C2)		☐ Drainage ☐ Saft Dep ☐ Oxidized ☐ Presenc ☐ Stunted ☐ Shallow	e Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3 e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3)
Surface High V Satura Water Sedim Drift D	we Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2)		Surface S Inundation Sparsely Hydrogen Dry Seas	s Visible on A Vegetated Co Sulfide Odor on Water Tabl	erial Imag ncave Sur (C1) e (C2)		☐ Drainage ☐ Salt Dep ☐ Oxidized ☐ Presence ☐ Stunted ☐ Shallow ☐ Geomore	e Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3 e of Reduced Iron (C4) or Stressed Plants (D1)
Surface High V Satura Water Sedim Drift D Mat of	ve Water (A1) Vater Table (A2) Ition (A3) Marks (B1) Itent Deposits (B2) Veposits (B3)		Surface S Inundation Sparsely Hydrogen Dry Seas	s Visible on A Vegetated Co Sulfide Odor on Water Tabl	erial Imag ncave Sur (C1) e (C2)		☐ Drainage ☐ Salt Dep ☐ Oxidized ☐ Presence ☐ Stunted ☐ Shallow ☐ Geomon	e Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3 e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2)
Surface High V Satura Water Sedim Drift D Mat of	we Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) deposits (B3) Crust of Algae or Neposits (B5)		Surface S Inundation Sparsely Hydrogen Dry Seas	s Visible on A Vegetated Co Sulfide Odor on Water Tabl	erial Imag ncave Sur (C1) e (C2)		☐ Drainage ☐ Salt Dep ☐ Oxidized ☐ Presence ☐ Stunted ☐ Shallow ☐ Geomon	e Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3 e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4)
Surface High V Satura Water Sedim Drift D Mat of Iron De	we Water (A1) Vater Table (A2) Ition (A3) Marks (B1) In the Deposits (B2) Ition (B3) Ition (B3) Ition (B3) Ition (B3) Ition (B3) Ition (B5) Itinual (Mari (B4)	Surface S Inundation Sparsely Hydrogen Dry Seas	s Visible on A Vegetated Con Sulfide Odor on Water Tabl plain in Rema	erial Imag ncave Sur (C1) e (C2) rks)		☐ Drainage ☐ Salt Dep ☐ Oxidized ☐ Presence ☐ Stunted ☐ Shallow ☐ Geomon	e Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3 e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4)
Surface High V Satura Water Sedim Drift D Mat of Iron De eld Observace Water	we Water (A1) Vater Table (A2) Ition (A3) Marks (B1) Itent Deposits (B2) Itensity (B3) Itensity (B3) Itensity (B5)	Mari (B4)	Surface S Inundation Sparsely Hydrogen Dry Seas	s Visible on A Vegetated Coo Sulfide Odor on Water Tabl splain in Rema	erial Imag ncave Suri (C1) e (C2) rks)		Salt Dep Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop FAC-Nei	e Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3 e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4) utral Test (D5)
Surface High V Satura Water Sedim Drift D Mat of Iron De	we Water (A1) Vater Table (A2) Ition (A3) Marks (B1) Itent Deposits (B2) Itensity (B3) Itensity (B3) Itensity (B5)	Mari (B4)	Surface S Inundation Sparsely Hydrogen Dry Seas	vegetated Con Sulfide Odor Sulfide Odor on Water Tabl Eplain in Rema	erial Imag ncave Sur (C1) e (C2) rks)	face (B8)	Salt Dep Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop FAC-Nei	e Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3 e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4)
Surface High V Satura Water Sedim Drift D Mat of Iron De eld Obser face Wate ter Table F	we Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Neposits (B5) vations: r Present?	Mari (B4)	Surface S Inundation Sparsely Hydrogen Dry Seas	s Visible on A Vegetated Coo Sulfide Odor on Water Tabl splain in Rema	erial Imag ncave Sur (C1) e (C2) rks)		☐ Drainage ☐ Salt Dep ☐ Oxidized ☐ Presence ☐ Stunted ☐ Shallow ☐ Geomon ☐ Microtop ☐ FAC-Net	e Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3 e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4) utral Test (D5)
Surface High V Satura Water Sedim Drift D Mat of Iron D eld Obser face Wate ter Table F curation Procludes cap	water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or Neposits (B5) vations: r Present? Present?	Mari (B4) No No Yes	Surface S Inundation Sparsely Hydrogen Dry Seas Other (Ex	s Visible on A Vegetated Coo Sulfide Odor on Water Tabl splain in Rema Depth (inc	erial Imag ncave Suri (C1) e (C2) rks) ches):	face (B8)	Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop FAC-Nei	e Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3 e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4) utral Test (D5)
Surface High V Satura Water Sedim Drift D Mat of Iron D eld Obser face Wate ter Table F curation Procludes cap	water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or teposits (B5) vations: r Present? esent? esent? eillary fringe)	Mari (B4) No No Yes	Surface S Inundation Sparsely Hydrogen Dry Seas Other (Ex	s Visible on A Vegetated Coo Sulfide Odor on Water Tabl splain in Rema Depth (inc	erial Imag ncave Suri (C1) e (C2) rks) ches):	face (B8)	Drainage Salt Dep Oxidized Presence Stunted Shallow Geomon Microtop FAC-Nei	e Patterns (B10) osits (C5) Rhizospheres on Living Roots (C3 e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) ographic Relief (D4) utral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Applicate/Owner: Brooks Range Peti	roleum							P.04
nvestigator(s): JBrekken, JO'Brien	La	andform (hills	side, terrace	Huumock,	etc: low/small	Samplin tussock:	g Point:	B-24
ocal Relief (concave, convex, none):	none	Sic	ope (%): <	1				
Subregion:	Lat:		Long		Datum:			
Are climate/hydrologic conditions on th	e site typical for this tim	ne of year? Y	es					
Are Vegetation?, No Soil? No	or Hydrocabon?	No	significantly	disturbed?	Are "Normal Cir	cumstances" Pr	esent?	Yes
Are Vegetation?, No Soil? No	or Hydrocabon?	No	naturally pr	oblematic?	(If needed, explain	any answers in R	emarks)	
SUMMARY OF FINDINGS - Attach sh	e map showing samp	ling point is	ocations, tra	ansects, Im	portant features,	etc.		
lydrophytic Vegetation Present?	Yes		Sampled Are					
Hydric Soils Present?	Yes	within a	a Wetland?	Yes				
Wetland Hydrology Present?	Yes							
Remarks:								
/EGETATION (List all specie	s in plot)				40-6			
Tree Stratum (Use scientific names	1	Absolute %Cover	The state of the s	Indicator Status	Dominance Tes			
1		NOUVE	Spence	Similar .	Number of Domi That Are OBL, F.		3	(A)
2.					Total Number of		_	- 474
3.					Species Across		4	(B)
4.					Percent of Domin		75	(A/B)
	Total	Cover:			Prevalence In	TATAL CA	_	41
Sampling/Shrub Stratum	50% of total cover:		of total cover:		Total % Cover	of: Multiplied by	y:	
1. Salix arctica		2		FAC	OBL Species	25 x 1 =	25	
2. Salix planifolia		1		FACW	FACW Species		22	_
3. Dryas integrifolia		40	Yes	EACU		45 × 3 =	135	-
4. Salix reticulata		15	Yes	EAC	UPL Species	40 x4= 0 x5=	0	-
5. Salix niphoclada (brachycarpa)		2		FAC	Column Totals:	121 (A)	342	(B)
6.					Pur tur			-
1		Cover: 60			Prevalence Inde	x = B/A = 2.8	3	
Herb Stratum	50% of total cover: 30	20%	of total cover.	12	Undenbudle V	anatotlan India		
Eriophorum angustifolium		25	Yes	OBL	Hydrophytic Ve		ators.	
2. Eriophorum vaginatum		5		FACW	particle and graphing	Test is ≤3.0		
3. Pedicularis lanata		1		EAC	1000 No. 100 N	ical Adaptions' (Provide	
4. Carex bigelowii		25	Yes	FAC	supporting data in	Remarks or on	a spere	erate sheet)
5. Arctagrostis latifolia		5		FACW	Problemati	c Hydrophytic V	egetatio	n' Explain)
6.					'Indicators of hy	dric soil and we	tland hy	drology must
					be present unles	ss aisturbed or p	robiemio	24
7.							_	
8.	Turk	Cover 64						
Company of the second	50% of total cover: 30	Cover: 61 0.5 20%	of total cover:	12.2	Hydrophytic Vege	etation Present?	E	/es
Plot size (radius, or length x width) 1		are Ground:				are the Water of	- 1	
% Cover of Wetland Bryophytes:	Total	Cover of Bry	ophytes:	15				

Remarks: Some fruticose lichens present , but not overly abundant.

Sampling Point:

Depth	escription: (Desc Matrix		Redox Featu	res	33190			
(Inches)	Color (moist)	%	Color (moist	%	Type	Loc ₂	Texture Remarks	Remarks
0-3								Organics
3-8	10 R 2.5/2	100					sandy clay loam	Organics/soil mix w/ >50% ro
8-14	5 Y 2.5/1	100					sandy clay loam	Organics/soil mix w/ <50% pg
14-20	5 Y 3/1	100					sandy clay loam	Organics/soil mix w/ <25% ro
Type: C	=Concentrations, I	D=Depletio	ns, RM=Reduc	ed Matrix.	2Locat	ion: PL=P	ore Linings, RC=Root	Channel, M=Matrix
Hydric Sc	oll Indicators:		India	ators for Pr	oblematic i	Hydric Sol	is 3;	
X Histo	sol or Histel (A1)			Alaska Col	or Change	TA4)4		Alaska Gleyed Without Hue 5Y or
Histic	Epipedon (A2)		Ė	Alaska Alp	ine Swales	(TA5)		Redder Underlying Layer
Hydr	ogen Sulfide (A4)			Alaska Red	lox With 2.5	Y Hue	T.	Other (Explain in Remarks)
Thick	Dark Surface (A1	12)						
☐ Alasi	ka Gleyed (A13)		3One	Indicator of	hydrophytic	vegetation	, one primary indicato	or of wetland hydrology,
T Alasi	ka Redox (A14)		and	an appropriat	e landscape	position n	nust be present.	
☐ Alasi	ka Gleyed Pores (A15)	4Give	details of co	olor change	in Remarks	S.	
Restrictive	Layer (if present	: frozen						V
G and		-					Hydric Solls Pro	esent? Yes
Depth:	21" bgs	_						· ·
YDROLO Wetland Hy	GY drology Indicato	rs:					Secondary In	dicators (2 or more required)
rimary India	cators (any one in	dicator is s	ufficient)					ined Leaves (B9)
Surfac	e Water (A1)		Surface S	Soil Cracks (E	36)			Patterns (B10)
High W	Vater Table (A2)		Inundation	ns Visible on	Aerial Imag	ery (B7)	Salt Dep	osits (C5)
X Satura	tion (A3)		Sparsely	Vegetated C	oncave Sur	face (B8)	and the second s	Rhizospheres on Living Roots (C3
Water	Marks (B1)		Hydrogen	Sulfide Odd	or (C1)			e of Reduced Iron (C4)
Sedim	ent Deposits (B2)		T Dry Seas	on Water Ta	ble (C2)		and the second second second second	or Stressed Plants (D1) Aquitard (D3)
Drift D	eposits (B3)		Other (E	xplain in Ren	narks)			phic Position (D2)
Mat of	Crust of Algae or	Marl (B4)						ographic Relief (D4)
Iron De	eposits (B5)						FAC-Net	utral Test (D5)
leld Obser	vations:				-		1	
rface Water	r Present?	No		Depth (i	nches):			
ater Table F	resent?	No		Depth (i	nches):		Wetland Hydr	ology Present? Yes
	illary fringe)	Yes		Depth (i		10		
Describe Re	corded Data (stre	am gauge,	monitoring we	l, aerial phot	os, previous	inspection	s), if available:	

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Development Project Borough/City: North Slope						Sampling Date	Aug 8, 20	
Applicate/Owner: Brooks Range Petr	oleum	-					D. 0.F	
nvestigator(s): JBrekken, JO'Brien	La	ndform (hills	side, terrace	c: hummocks	Sampling Point:	B-25		
Local Relief (concave, convex, none):	none	Sid	ope (%): <			-		
Subregion:	Lat:		Long		Datum:			
Are climate/hydrologic conditions on the	e site typical for this tim	e of year? Y	es					
Are Vegetation?,No Soil? No	or Hydrocabon?	No	significantly	disturbed?	Are "Normal Circum	nstances" Present?	Yes	
Are Vegetation?, No Soil? No	or Hydrocabon?	No	naturally pr	oblematic?	(If needed, explain any	answers in Remarks)		
SUMMARY OF FINDINGS - Attach sit	e map showing sampl	ing point is	ocations, tra	ansects, Imp	ortant features, etc			
Hydrophytic Vegetation Present?	Yes	Is the S	Sampled Are	а				
Hydric Soils Present?	Yes	within	a Wetland?	Yes				
Wetland Hydrology Present?	Yes							
Remarks:								
/EGETATION (List all species	s in plot)							
Tree Stratum (Use scientific names)		Absolute %Cover	Dominant Species	Indicator Status	Dominance Test w	orksheet:		
1.		76COVE)	Sheries		Number of Dominan That Are OBL, FAC		(A)	
2.					Total Number of Do			
3.					Species Across All S		(B)	
4.					Percent of Dominan			
-	Total C	Cover			That Are OBL, FAC	2.3 -7.2 -7.	(A/B)	
Sampling/Shrub Stratum	50% of total cover:		of total cover:		Total % Cover of:			
1. Salix reticulata		5		FAC	OBL Species 20	x 1 = 20		
2. Salix planifolia		1		FACW	FACW Species 14	x 2 = 28		
3. Dryas integrifolia		30	Yes	FACO	FAC Species 45	x 3 = 135		
4.					FACU Species 30 UPL Species 0	x 4 = 120	_	
5.					Column Totals: 109	x 5 = 0 (A) 303	(B)	
6.					100		_	
	Total C	over: 36		- 1	Prevalence Index =	B/A = 2.78		
Herb Stratum	50% of total cover: 18	20%	of total cover;	7.2		San Dunation		
Eriophorum angustifolium		20	Yes	OBL	Hydrophytic Vege			
2. Carex bigelowii		40	Yes	FAC	▼ Dominance Te ▼ Prevalence Te			
3. Carex saxatilis		10		FACW		Adaptions' (Provide		
4. Arctagrostis latifolia		2		A 10		emarks or on a sper		
5. Draba alpina		1		NI	Problematic H	ydrophytic Vegetatio	on' Explain)	
6. Pedicularis sudetica		1		FACIAL		soil and wetland hy		
		1		LASIV	be present unless d	isturbed or problemi	<u>C.</u>	
7.								
8.	42.75	over 74						
	50% of total cover: 37	over: 74 20%	of total cover:	14.8 H	lydrophytic Vegetati	on Present?	Yes	
Plot size (radius, or length x width)		are Ground:			Y L. You you do you	20.7.225.00		
% Cover of Wetland Bryophytes:	Total C	Cover of Bry	ophytes:	5				

0-3 3-9 10 9-12 10	O YR 2/1 O YR 3/1	100	olor (moist)	%	Type1	Loc2	Texture Remarks	Remarks Organics
9-12 10) YR 3/1	100					loam	
1Type: C=Con							loam	Organics/soil mix w/ >50% ro
	ncentrations, D=	Danloticas					clay loam	Organics/soil mix w/ small gra
Hydrogen Thick Dar Alaska G	or Histel (A1) ipedon (A2) in Sulfide (A4) ink Surface (A12) ileyed (A13) iedox (A14)		Indica 	Alaska Colo Alaska Alpi Alaska Red Indicator of h	oblematic I or Change (ne Swales ox With 2.5 nydrophytic e landscape	Hydric Soll (TA4)4 (TA5) 5Y Hue c vegetation, e position m	, one primary indicat	Alaska Gleyed Without Hue 5Y or Redder Underlying Layer Other (Explain in Remarks) or of wetland hydrology,
	leyed Pores (A1 yer (if present):	170	40196	details of co	ioi change	THE HARA	Hydric Solls P	resent? Yes
YDROLOGY				-				
	logy indicators:							ndicators (2 or more required)
and the Vision Vis	rs (any one indic	ator is suffic	- T ST - T	oil Cracks (B	10)		A STATE OF THE PARTY OF THE PAR	ained Leaves (B9)
	r Table (A2)			115 11 11	Aug de Kr	(07)	Salt De	e Patterns (B10)
Water Mark Sediment D Drift Depos	ks (B1) Deposits (B2) sits (B3) st of Algae or Ma	ari (B4)	Sparsely Mydrogen Dry Seaso	s Visible on a Vegetated Co Sulfide Odo on Water Tat plain in Rem	oncave Sur r (C1) ble (C2)		Oxidized Present Stunted Shallow Geomo	d Rhizospheres on Living Roots (C3 ce of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) rphic Position (D2) pographic Relief (D4) eutral Test (D5)
Water Mark Sediment Drift Depos Mat of Crus Iron Depos	ks (B1) Deposits (B2) sits (B3) st of Algae or Ma sits (B5)	ari (B4)	Sparsely Mydrogen Dry Seaso	Vegetated Co Sulfide Odo on Water Tab	oncave Sur r (C1) ble (C2)		Oxidized Present Stunted Shallow Geomo	d Rhizospheres on Living Roots (C3 ce of Reduced Iron (C4) or Stressed Plants (D1) or Aquitard (D3) rphic Position (D2) pographic Relief (D4)
Water Mark Sediment Depose Mat of Crus Iron Depose Teld Observation	ks (B1) Deposits (B2) sits (B3) sit of Algae or Ma sits (B5) ons:		Sparsely Mydrogen Dry Seaso	Vegetated Co Sulfide Odo on Water Tab	oncave Sur r (C1) ble (C2) aarks)		Oxidized Present Stunted Shallow Geomo	d Rhizospheres on Living Roots (C3 ce of Reduced Iron (C4) or Stressed Plants (D1) or Aquitard (D3) rphic Position (D2) pographic Relief (D4)
Water Mark Sediment D Drift Depos Mat of Crus Iron Depos Field Observation	ks (B1) Deposits (B2) sits (B3) sits of Algae or Ma sits (B5) ons:	arl (B4)	Sparsely Mydrogen Dry Seaso	Vegetated Co Sulfide Odo on Water Tat plain in Rem Depth (in Depth (in	oncave Sur r (C1) ble (C2) arks) nches):		Oxidized Present Stunted Shallow Geomot Microto FAC-Ne	d Rhizospheres on Living Roots (C3 ce of Reduced Iron (C4) or Stressed Plants (D1) or Aquitard (D3) rphic Position (D2) pographic Relief (D4)
Water Mark Sediment D Drift Depos Mat of Crus Iron Depos Field Observation Field Observation Frace Water Presentation Presentation Presentation Company of the Company of t	ks (B1) Deposits (B2) sits (B3) sit of Algae or Mi sits (B5) ons: esent? ent?	No Yes Yes	Sparsely Mydrogen Dry Seaso Other (Ex	Vegetated Co Sulfide Odo on Water Tat plain in Rem Depth (in Depth (in Depth (in	oncave Sur r (C1) ble (C2) aarks) nches): nches):	12 0	Oxidized Present Stunted Shallow Geomo Kicroto FAC-Ne	d Rhizospheres on Living Roots (C3 ce of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) rphic Position (D2) pographic Relief (D4) eutral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen	t Project Borough/C	city:North SI	ope			Sampling	g Date	Aug 8, 20
Applicate/Owner: Brooks Range Petr	oleum	-				Camalia	- 0-1-4	
Investigator(s): JBrekken, JO'Brien		andform (hill:	side, terrace	, Huumock, e	to: hummock	Sampling	g Point:	B-26
Local Relief (concave, convex, none):	none	Slo	ope (%): <	1				
Subregion:	Lat	1	Long	:-	Datum:			
Are climate/hydrologic conditions on the	site typical for this tir	me of year? Y	'es		= =			
Are Vegetation?,No Soil? No	or Hydrocabon	? No	significantly	y disturbed?	Are "Normal Cir	cumstances" Pr	esent?	Yes
Are Vegetation?,No Soil? No	or Hydrocabon	? No	naturally pr	oblematic?	(If needed, explain	any answers in R	emarks)	
SUMMARY OF FINDINGS - Attach sit	e map showing sam	pling point is	ocations, tr	ansects, Imp	ortant features,	etc.		
Hydrophytic Vegetation Present?	Yes	Is the S	Sampled Are					
Hydric Soils Present?	Yes	within a	a Wetland?	Yes				
Wetland Hydrology Present?	Yes							
Remarks:								
VEGETATION (List all species	in plot)							
Tree Stratum (Use scientific names)		Absolute %Cover	Dominant Species	Indicator Status	Dominance Tes			
1.		70COVEL	Орсыца	Oldida	Number of Domi That Are OBL, F		3	(A)
2.					Total Number of			
3.					Species Across		4	(B)
4.					Percent of Domi	nant Species		
-	Total	Cover:			That Are OBL, F		75	(A/B)
Sampling/Shrub Stratum	50% of total cover:	12 / 13 /	of total cover:		Prevalence II	r of: Multiplied by		
1. Salix reticulata		15	Yes	FAC	A	0 x1=		
2. Salix niphoclada (brachycarpa)		5		FAC	FACW Species	30 x 2 =	60	-
3. Dryas integrifolia		20	Yes	FACU	FAC Species	63 x 3 =	189	
4. Cassiope tetragona		5		FACU		25 x 4 =	100	_
5.					UPL Species Column Totals:	0 x 5 =	349	(B)
6.					Column Totals.	118 (7)	-	= "
	Total	Cover: 45			Prevalence Inde	x = B/A = 2.96	6	
Herb Stratum	50% of total cover: 2	22.5 20%	of total cover:	9				
Eriophorum vaginatum		20	Yes	FACW	Hydrophytic V		ators:	
2. Carex bigelowii		40	Yes	FAC		e Test is >50%		
3. Carex saxatilis		10		FACW		e Test is≤3.0 ical Adaptions' (f	Drovida	
Saussurea angustifolia		2			supporting data in		0.00	rate sheet)
5. Polygonum viviparum					Problemati	c Hydrophytic V	egetatio	n' Explain)
Transferred April 1		1		FAC	' Indicators of hy	dric soil and wet	land hyd	rology must
6.					be present unles	ss disturbed or p	roblemic	
Z.				-			-	
8.	100							
Plot size (radius, or length x width) 1	50% of total cover: 3 5 radius % I	Bare Ground:			Hydrophytic Vege	etation Present?	F	es
% Cover of Wetland Bryophytes:	Total	Cover of Bry	ophytes:	5				

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Remarks:

White crustose and fruticose lichens present, but not overly abundant (~10 cover).

Sampling Point:

(Inches)	Color (moist)	%		x Feature (moist)		%	Type	Loc ₂	Texture Remarks	Remarks
0-1										Organics
1-3	10 R 2.5/1	100							loam	Organics/soil mix w/ <50% ro
3-13	5 Y 2.5/2	80	5 YR 5/8		2	20	RM	PL	clay loam	Organics/soil mix w/ w/ <50%
13-20	10 R 2.5/1	100							loamy sand	Organics/soil mix
Type: C=	=Concentrations, E)=Deple	tions, RM:	=Reduce	d Matrix.		2Locatio	on: PL=P	ore Linings, RC=Root	Channel, M=Matrix
Hydric Sc	oil indicators:			Indica	tors for	Probl	lematic H	ydric Sol	l B 3:	
X Histor	sol or Histel (A1)			Г	Alaska C	Color	Change (T	A4)4	Г	Alaska Gleyed Without Hue 5Y or
Histic	Histic Epipedon (A2) Alaska Alpine Swales (TA5)				1	Redder Underlying Layer				
Hydre	ogen Sulfide (A4)				Alaska R	Redox	With 2.5Y	Hue	Г	Other (Explain in Remarks)
Thick	Dark Surface (A1	2)								
Alask	ka Gleyed (A13)			3One I	ndicator	of hyd	drophytic v	egetation	, one primary indicato	r of wetland hydrology,
- Alasi	ka Redox (A14)			and ar	арргорг	riate la	andscape	position n	nust be present.	
Alasi	ka Gleyed Pores (A	A15)		4Give	details of	color	change in	Remark	S	
Restrictive	Layer (if present)	froze	n						United Calls Da	esent? Yes
		-							Hydric Solis Pro	esenty les
Depth:	16" bgs									÷
emarks:										
/DROLO	GY drology indicator	rs:			-				Secondary In	dicators (2 or more required)
DROLO		7	s sufficient	0	_				7 7 7 7 7 7 7 7	dicators (2 or more required) ined Leaves (B9)
DROLO Vetland Hydrimary India	drology indicator	7		100		s (B6)			Water Sta	Chart to the contract of the c
/DROLO /etland Hy- rimary India — Surface	drology Indicator cators (any one inc	7	F S	urface So			rial Image	ery (B7)	Water Sta	ined Leaves (B9)
/DROLO /etland Hydrimary India Surface High W	drology Indicator cators (any one ind e Water (A1)	7	F Si	urface So undations	s Visible o	on Ae			Water Sta Drainage Salt Depo	ined Leaves (B9) Pattems (B10) osits (C5) Rhizospheres on Living Roots (C
/DROLO /etland Hydrimary India - Surface - High W	drology Indicator cators (any one inde e Water (A1) Vater Table (A2)	7	F Si	urface So undations parsely V	s Visible o	on Ae	rial Image cave Surfa		Water Sta Drainage Salt Dep Oxidized Presence	ined Leaves (B9) Pattems (B10) osits (C5) Rhizospheres on Living Roots (Ca) e of Reduced Iron (C4)
/DROLO /etland Hydrimary India	drology Indicator cators (any one ind e Water (A1) Vater Table (A2) tion (A3)	7	Γ s _i Γ ln _i Γ s _i	urface So undations parsely V ydrogen	s Visible o	on Ae d Con Odor (rial Image cave Surfa C1)		Water Sta Drainage Salt Depr Oxidized Presence Stunted of	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (Ca) e of Reduced Iron (C4) or Stressed Plants (D1)
/DROLO /etland Hy rimary India Surface High W X Satural Water Sedime	drology Indicator cators (any one inc e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2)	7		urface So undations parsely V ydrogen ry Seaso	s Visible o egetated Sulfide C	on Ae d Cond Odor (C	rial Image cave Surfa C1) (C2)		Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (Cie of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3)
/DROLO /etland Hydrimary India - Surface - High W X Satural - Water - Sedime - Drift D	drology Indicator cators (any one index e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3)	dicator i		urface So undations parsely V ydrogen ry Seaso	s Visible of Vegetated Sulfide Con Water	on Ae d Cond Odor (C	rial Image cave Surfa C1) (C2)		Water Sta Drainage Salt Depo Oxidized Presence Stunted Shallow Geomory	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (Cie of Reduced Iron (C4) por Stressed Plants (D1) Aquitard (D3) phic Position (D2)
/DROLO /etland Hydrimary India - Surface - High W X Satural - Water - Sedime - Drift D - Mat of	drology Indicator cators (any one index e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or	dicator i		urface So undations parsely V ydrogen ry Seaso	s Visible of Vegetated Sulfide Con Water	on Ae d Cond Odor (C	rial Image cave Surfa C1) (C2)		Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow Geomory Microtop	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (Cie of Reduced Iron (C4) por Stressed Plants (D1) Aquitard (D3) pohic Position (D2) ographic Relief (D4)
/DROLO /etland Hydrimary India - Surface - High W X Satural - Water - Sedime - Drift D - Mat of	drology Indicator cators (any one index e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3)	dicator i		urface So undations parsely V ydrogen ry Seaso	s Visible of Vegetated Sulfide Con Water	on Ae d Cond Odor (C	rial Image cave Surfa C1) (C2)		Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow Geomory Microtop	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (Cie of Reduced Iron (C4) por Stressed Plants (D1) Aquitard (D3) phic Position (D2)
/DROLO /etland Hydrimary India - Surface - High W X Satural - Water - Sedime - Drift D - Mat of	drology Indicator cators (any one index e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5)	dicator i		urface So undations parsely V ydrogen ry Seaso	s Visible o /egetated Sulfide C n Water olain in R	on Ae d Cond Odor (f Table	rial Image cave Surfa C1) (C2) ks)		Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow Geomory Microtop	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (Cie of Reduced Iron (C4) por Stressed Plants (D1) Aquitard (D3) pohic Position (D2) ographic Relief (D4)
/DROLO /etland Hydrimary India - Surface - High W X Satural - Water - Sedime - Drift Do	drology indicator cators (any one index e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations:	dicator i		urface So undations parsely V ydrogen ry Seaso	s Visible of Vegetated Sulfide Con Water	on Ae d Cond Odor (f Table	rial Image cave Surfa C1) (C2) ks)		Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow Geomory Microtop	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (Cie of Reduced Iron (C4) por Stressed Plants (D1) Aquitard (D3) pohic Position (D2) ographic Relief (D4)
/DROLO /etland Hydrimary India - Surface - High W X Satural - Water - Sedime - Drift De - Mat of - Iron De	drology Indicator cators (any one index e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations: r Present?	Mart (B		urface So undations parsely V ydrogen ry Seaso	s Visible o /egetated Sulfide C n Water olain in R	on Ae d Cond Odor (i Table demand	rial Image cave Surfa C1) (C2) ks)		Water Sta Drainage Salt Dept Oxidized Presence Stunted Shallow Geomory Microtop FAC-Net	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (Cie of Reduced Iron (C4) por Stressed Plants (D1) Aquitard (D3) pohic Position (D2) ographic Relief (D4)
FOROLO Fetland Hydrimary India Surface High W Saturat Water Sedime Drift De Mat of Iron De Iro	drology Indicator cators (any one inc e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations: r Present? esent?	Marl (B		urface So undations parsely V ydrogen ry Seaso	s Visible of 'egetated Sulfide Con Water plain in R	on Ae d Cond Odor (Table demand	rial Image cave Surfa C1) (C2) ks)		Water Sta Drainage Salt Dept Oxidized Presence Stunted Shallow Geomory Microtop FAC-Net	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (Cie of Reduced Iron (C4) por Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) utral Test (D5)
/DROLO /etland Hydrimary India - Surface - High W X Satural - Water - Sedime - Drift D - Mat of - Iron De /eld Observater /face Water	drology Indicator cators (any one inc e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Crust of Algae or eposits (B5) vations: r Present?	Mari (B	F Si F Int	urface So undations parsely V ydrogen ry Seaso other (Exp	s Visible of 'egetated Sulfide Con Water plain in R Depth Depth Depth	on Ae I Con Odor (Table Table In (inch Inch Inch Inch Inch Inch Inch Inch I	rial Image cave Surfa (C1) (C2) ks)	10	Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow Geomory Microtop FAC-Net	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (Cie of Reduced Iron (C4) por Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) utral Test (D5)
/DROLO /etland Hydrimary India - Surface - High W X Satural - Water - Sedime - Drift D - Mat of - Iron De /eld Observater /face Water	drology Indicator cators (any one inc e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) **Crust of Algae or eposits (B5) vations: r Present? esent? esent?	Mari (B	F Si F Int	urface So undations parsely V ydrogen ry Seaso other (Exp	s Visible of 'egetated Sulfide Con Water plain in R Depth Depth Depth	on Ae I Con Odor (Table Table In (inch Inch Inch Inch Inch Inch Inch Inch I	rial Image cave Surfa (C1) (C2) ks)	10	Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow Geomory Microtop FAC-Net	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (Cie of Reduced Iron (C4) por Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) utral Test (D5)
/DROLO /etland Hydrimary India - Surface - High W X Satural - Water - Sedime - Drift D - Mat of - Iron De /eld Observater /face Water	drology Indicator cators (any one inc e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) **Crust of Algae or eposits (B5) vations: r Present? esent? esent?	Mari (B	F Si F Int	urface So undations parsely V ydrogen ry Seaso other (Exp	s Visible of 'egetated Sulfide Con Water plain in R Depth Depth Depth	on Ae I Con Odor (Table Table In (inch Inch Inch Inch Inch Inch Inch Inch I	rial Image cave Surfa (C1) (C2) ks)	10	Water Sta Drainage Salt Depo Oxidized Presence Stunted of Shallow Geomory Microtop FAC-Net	ined Leaves (B9) Patterns (B10) posits (C5) Rhizospheres on Living Roots (Cie of Reduced Iron (C4) por Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) utral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen Applicate/Owner: Brooks Range Peti		-	· F3		Sampling	Date Aug 8,
nvestigator(s): JBrekken, JO'Brien		ndform (hills	side, terrace,	Humock	etc: micro highs & low:	Point: B-27
Local Relief (concave, convex, none):	none	3235	pe (%): <		Tillero mgns & lot	
Subregion:	Lat:		Long		Datum:	
Are climate/hydrologic conditions on th		e of year? Y				
Are Vegetation?,No Soil? No		075	significantly	dicturbod?	Are "Normal Circumstances" Pres	onto Von
Are Vegetation?,No Soil? No	or Hydrocabon?		naturally pr		(If needed, explain any answers in Ren	
	or Hydrocabon?				suchá nacional	
SUMMARY OF FINDINGS - Attach sit			cations, tra sampled Are		portant features, etc.	
lydrophytic Vegetation Present?	Yes		Wetland?	Yes		
Hydric Soils Present? Vetland Hydrology Present?	Yes					
Remarks:	165					
vernarks.	5 2 5		_	_		
EGETATION (List all species	s in plot)	Abertae	Daminant	ladianta I	B	
Tree Stratum (Use scientific names)		Absolute %Cover	Dominant Species	Indicator Status	Number of Dominant Species	
1.					That Are OBL, FACW, or FAC:	(A)
2.					Total Number of Dominant	
3.					Species Across All Strata:	(B)
4.					Percent of Dominant Species That Are OBL, FACW, FAC:	75 (A/B)
Company of the Company	Total (Cover:		-	Prevalence Index:	1 3 7
Sampling/Shrub Stratum	50% of total cover:		of total cover:		Total % Cover of: Multiplied by:	
Salix reticulata		15	Yes	FAC	OBL Species 30 x 1 = 5	30
2. Salix planifolia		2		FACW		20
3. Dryas integrifolia		30	Yes	FACU		144
4.					UPL Species 0 x 4 = 0	
5.					[H.L. H. W. H. L.	248 (B)
6.						
tel access of the same	Total C	Cover: 47		2.0	Prevalence Index = B/A = 2.64	
Herb Stratum	50% of total cover: 23	3.5 20%	of total cover:	9,4	Hydrophytic Vegetation Indica	
Eriophorum angustifolium		10	Yes	OBL	✓ Dominance Test is >50%	iors.
2. Carex rotundata		20	Yes	OBL	Prevalence Test is ≤3.0	
3. Carex scirpoidea		5		FACU	Morphological Adaptions' (Pr	ovide
4. Papavar macounii		1		FACU	supporting data in Remarks or on a	
5. Alopecurus alpinus		5		FACW	Problematic Hydrophytic Veg	etation' Explain)
6. Poa arctica		2		FAC	'Indicators of hydric soil and wetla	
				75 AS A .	be present unless disturbed or pro	blemic.
7. Carex capillaris		3		FACW		
8. Pedicularis verticillata		1		FAC		
	Total 0 50% of total cover: 23		of total cover:	9.4	Hydrophytic Vegetation Present?	Yes
Plot size (radius, or length x width) 1		are Ground:	10		A TOTAL CARTERING CLASSING	1.00
% Cover of Wetland Bryophytes:	Total (Cover of Bry	ophytes:	0		

Remarks: White crustose and fruticose lichens present.

Sampling Point:

(Inches) Color (mo	oist) %	Redox Feature Color (moist)	es %	Туре	Loc ₂	Texture Remarks	Remarks
0-2 10 R 2.5	77.5					loam	>50% roots in soil matrix
2-16 2.5 Y 5/2	2 50	5 YR 5/8	50	RM	PL/M	loamy sand	Organics/soil mix
16-20 2.5 Y 2.5	5/2 100					sandy clay loam	
Type: C=Concentra	ations, D=Deple	etions, RM=Reduce	d Matrix.	2Locatio	on: PL=Po	re Linings, RC=Roo	t Channel, M≔Matrix
Hydric Soll Indicate	ors:	Indica	tors for Prob	lematic H	ydric Soll	B3:	
▼ Histosol or History	el (A1)	Г	Alaska Color	Change (T	A4)4	Г	Alaska Gleyed Without Hue 5Y or
Histic Epipedon	ipedon (A2) Alaska Alpine Swales (TA5)				(A5)		Redder Underlying Layer
Hydrogen Sulfic	de (A4)		Alaska Redox	With 2.5Y	' Hue	Г	Other (Explain in Remarks)
Thick Dark Surf	face (A12)						
Alaska Gleyed	(A13)	3One	ndicator of hy	drophytic v	egetation,	one primary indicat	or of wetland hydrology,
Alaska Redox (A14)	and a	n appropriate l	landscape	position m	ust be present.	
Alaska Gleyed	Pores (A15)	4Give	details of colo	r change in	Remarks		
Restrictive Layer (if	present): none	encountered					and the same
		· onocanionoc				Hydric Solls P	resent? Yes
Depth:							·
YDROLOGY Vetland Hydrology In							
. 경영() : [10] - 10 등에 프린 : [1		PE-to-M					ndicators (2 or more required)
Primary Indicators (any	one indicator i		il Crocks (BE			Water St	ained Leaves (B9)
Primary Indicators (any Surface Water (A	one indicator i	Surface So	oil Cracks (B6)	11000000000	Dr (P7)	Water St	ained Leaves (B9) e Patterns (B10)
Primary Indicators (any Surface Water (A High Water Table	one indicator i	Surface So	S Visible on A	erial Image	E 70 A	Water St Drainage Salt Dep	ained Leaves (B9)
Primary Indicators (any Surface Water (A High Water Table X Saturation (A3)	one indicator i	Surface Some Inundations Sparsely V	Visible on Ae	erial Image icave Surfa	E 70 A	Water St Drainage Salt Dep Oxidized	ained Leaves (B9) e Patterns (B10) posits (C5)
Primary Indicators (any Surface Water (A High Water Table X Saturation (A3) Water Marks (B1)	one indicator i 1) (A2)	Surface Some Inundations Sparsely V	S Visible on Adverse Visible on Adverse Visible on Adverse Visible Odor (erial Image scave Surfa (C1)	E 70 A	Water St Drainage Salt Dep Oxidized	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3
Primary Indicators (any Surface Water (A High Water Table X Saturation (A3) Water Marks (B1) Sediment Deposi	one indicator i (A2) its (B2)	Surface Some Inundations Sparsely V Hydrogen Dry Seaso	s Visible on Ad egetated Con Sulfide Odor (on Water Table	erial Image acave Surfa (C1) e (C2)	E 70 A	Water St Drainage Salt Dep Oxidized Presend Stunted Shallow	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3 pe of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3)
Primary Indicators (any Surface Water (A High Water Table Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3)	one indicator (1) (A2) (A2) (ts (B2)	Surface Some Inundations Sparsely Will Hydrogen Dry Seaso Other (Exp	S Visible on Adverse Visible on Adverse Visible on Adverse Visible Odor (erial Image acave Surfa (C1) e (C2)	E 70 A	Water St Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2)
Primary Indicators (any Surface Water (A High Water Table X Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3 Mat of Crust of A	one indicator in (1) (A2) (K2) (S2) (S3) (S3) (S4) (S4)	Surface Some Inundations Sparsely Will Hydrogen Dry Seaso Other (Exp	s Visible on Ad egetated Con Sulfide Odor (on Water Table	erial Image acave Surfa (C1) e (C2)	E 70 A	Water St Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4)
Primary Indicators (any Surface Water (A High Water Table Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3)	one indicator in (1) (A2) (K2) (S2) (S3) (S3) (S4) (S4)	Surface Some Inundations Sparsely Will Hydrogen Dry Seaso Other (Exp	s Visible on Ad egetated Con Sulfide Odor (In Water Table	erial Image acave Surfa (C1) e (C2)	E 70 A	Water St Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2)
Primary Indicators (any Surface Water (A High Water Table Saturation (A3) Water Marks (B1) Sediment Deposi Drift Deposits (B3 Mat of Crust of A Iron Deposits (B5	one indicator in (1) (A2) (K2) (S2) (S3) (S3) (S4) (S4)	Surface Some Inundations Sparsely Will Hydrogen Dry Seaso Other (Exp	s Visible on Ad egetated Con Sulfide Odor (In Water Table	erial Image acave Surfa (C1) e (C2)	E 70 A	Water St Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4)
Primary Indicators (any Surface Water (A High Water Table Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3 Mat of Crust of A Iron Deposits (B5	y one indicator (a.1) (A2) (A2) (its (B2) (B3) (Igae or Marl (B3)	Surface Some Inundations Sparsely Will Hydrogen Dry Seaso Other (Exp	s Visible on Ad egetated Con Sulfide Odor (In Water Table	erial Image acave Surfa (C1) a (C2) rks)	E 70 A	Water St Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4)
Primary Indicators (any Surface Water (A High Water Table X Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3 Mat of Crust of A Iron Deposits (B5	y one indicator (a.1) a (A2) b) its (B2) 3) algae or Marl (B	Surface Some Inundations Sparsely No.	s Visible on Ad /egetated Con Sulfide Odor (In Water Table In In Remain	erial Image acave Surfa (C1) a (C2) rks)	E 70 A	Water St Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4)
Surface Water (A High Water Table X Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3) Mat of Crust of A Iron Deposits (B5)	one indicator (a.1) (A2) (B2) (B2) (B3) (B3) (B4) (B5)	Surface Some Inundations Sparsely No.	S Visible on Ac regetated Con Sulfide Odor (In Water Table blain in Remai Depth (inc	erial Image icave Surfa (C1) a (C2) rks) hes):	ace (B8)	Water St Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) putral Test (D5)
Primary Indicators (any Surface Water (A High Water Table Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3 Mat of Crust of A Iron Deposits (B5 Field Observations: urface Water Present? atter Table Present?	y one indicator (1) (1) (A2) (b) (its (B2) (b) (lgae or Marl (B	Surface Some Inundations Sparsely No.	s Visible on Ad regetated Con Sulfide Odor (on Water Table plain in Reman	erial Image icave Surfa (C1) a (C2) rks) hes):	E 70 A	Water St Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) putral Test (D5)
Primary Indicators (any Surface Water (A High Water Table X Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3 Mat of Crust of A Iron Deposits (B5 Irida Observations: Irface Water Present? Indicators (A) Iron Deposits (B5 Irida Observations: Irface Water Present? Indicators (A) Iron Deposits (B5 Irida Observations: Irface Water Present? Indicators (A) Iron Deposits (B5 Irida Observations: Irface Water Present? Irida Observations (B5 Irida Observations)	y one indicator (1) (A2) (A2) (Its (B2) (B3) (Itgae or Mari (B-6))	Surface Some Inundations Sparsely Managem Dry Season Other (Expanse) No Season Other (Expanse) No Season Other (Expanse)	S Visible on Ac regetated Con Sulfide Odor (on Water Table plain in Remail Depth (inc Depth (inc	erial Image acave Surfa (C1) a (C2) rks) hes): hes):	10	Water St Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) putral Test (D5)
Surface Water (A High Water Table Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3 Mat of Crust of A Iron Deposits (B5) Ield Observations: rface Water Present? ater Table Present? scludes capillary fringe	y one indicator (1) (A2) (A2) (Its (B2) (B3) (Itgae or Mari (B-6))	Surface Some Inundations Sparsely Managem Dry Season Other (Expanse) No Season Other (Expanse) No Season Other (Expanse)	S Visible on Ac regetated Con Sulfide Odor (on Water Table plain in Remail Depth (inc Depth (inc	erial Image acave Surfa (C1) a (C2) rks) hes): hes):	10	Water St Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) putral Test (D5)
Surface Water (A High Water Table Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3 Mat of Crust of A Iron Deposits (B5) Ield Observations: rface Water Present? ater Table Present? scludes capillary fringe	y one indicator (1) (A2) (A2) (Its (B2) (B3) (Itgae or Mari (B-6))	Surface Some Inundations Sparsely Managem Dry Season Other (Expanse) No Season Other (Expanse) No Season Other (Expanse)	S Visible on Ac regetated Con Sulfide Odor (on Water Table plain in Remail Depth (inc Depth (inc	erial Image acave Surfa (C1) a (C2) rks) hes): hes):	10	Water St Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) putral Test (D5)
Surface Water (A) High Water Table Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3) Iron Deposits (B5) Iron Deposits (B5) Irid Observations: Urface Water Present? Vater Table Present? Vater Table Present? Vater Table Recorded Da	y one indicator (1) (A2) (A2) (Its (B2) (B3) (Itgae or Mari (B-6))	Surface Some Inundations Sparsely Managem Dry Season Other (Expanse) No Season Other (Expanse) No Season Other (Expanse)	S Visible on Ac regetated Con Sulfide Odor (on Water Table plain in Remail Depth (inc Depth (inc	erial Image acave Surfa (C1) a (C2) rks) hes): hes):	10	Water St Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C5) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) putral Test (D5)
Primary Indicators (any Surface Water (A High Water Table Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3) Mat of Crust of A	y one indicator (1) (A2) (A2) (Its (B2) (B3) (Itgae or Mari (B-6))	Surface Some Inundations Sparsely Managem Dry Season Other (Expanse) No Season Other (Expanse) No Season Other (Expanse)	S Visible on Ac regetated Con Sulfide Odor (on Water Table plain in Remail Depth (inc Depth (inc	erial Image acave Surfa (C1) a (C2) rks) hes): hes):	10	Water St Drainage Salt Dep Oxidized Presend Stunted Shallow Geomor Microtop FAC-Ne	ained Leaves (B9) e Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3) e of Reduced Iron (C4) or Stressed Plants (D1) Aquitard (D3) phic Position (D2) pographic Relief (D4) putral Test (D5)

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Devel	opment Project Bo	rough/City:North S	lope			Sampling Date	Aug 9, 20
Applicate/Owner: Brooks Ran	ge Petroleum						-
Investigator(s): JBrekken, JO	Brien	Landform (hi	llside, terrace	, Huumock, e	tc: low hummocks	Sampling Point:	B-28
Local Relief (concave, convex	none): concave	s	lope (%): <	1		_	
Subregion:		Lat:	Long		Datum:		
Are climate/hydrologic condition	ns on the site typical fo	or this time of year?	Yes	-			
Are Vegetation?,No Sc	il? No or Hydr	ocabon? No	significantly	y disturbed?	Are "Normal Circumst	ances" Present?	Yes
Are Vegetation?,No Sc	il? No or Hydr	ocabon? No	naturally p	oblematic?	(If needed, explain any ar	swers in Remarks)	
SUMMARY OF FINDINGS - A	ttach site map showl	ng sampling point	locations, tr	ansects, imp	ortant features, etc.		
Hydrophytic Vegetation Preser	nt? Yes		Sampled Are				
Hydric Soils Present?	Yes	within	a Wetland?	Yes			
Wetland Hydrology Present?	Yes						
Remarks: Low-lying wet area ad	acent to small lake						
VEGETATION (List all s	pecies in plot)						
Tree Stratum (Use scientific		Absolute		Indicator	Dominance Test work	sheet:	
1	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	%Cove	Species	Status	Number of Dominant S That Are OBL, FACW,		(A)
2.					Total Number of Domin		- ""
3.					Species Across All Stra		(B)
					Percent of Dominant S		
4.		Total Cover:			That Are OBL, FACW,	FAC: 66	(A/B)
Sampling/Shrub Stratum	50% of total o		6 of total cover	8	Prevalence Index: Total % Cover of: M	ultiplied by:	
Salix reticulata		2		EAC	OBL Species 55	x 1 = 55	
2. Salix planifolia		2		FACW	FACW Species 22	x2= 44	=
3. Dryas integrifolia		12	Yes	FACU	FAC Species 16	x 3 = 48	Ξ' Ι
4. Salix niphoclada (brachyca	arpa)	1		FAC	FACU Species 14	x 4 = 56	27
5.					UPL Species 0 Column Totals: 107	$-\frac{x 5 = 0}{(A)}$	(B)
6.					Column Totals. 107	_ (A) 203	
		Total Cover: 17			Prevalence Index = B//	A = 1.90	
Herb Stratum	50% of total co	over: 8.5 20%	of total cover:	3.4	5. H-17. Col-V.	Language of	
Eriophorum angustifolium		55	Yes	OBL	Hydrophytic Vegetat		
2. Polygonum viviparum		2		EAC	▼ Dominance Test ▼ Prevalence Test		
3. Carex saxatilis		20	Yes	FACW	▼ Prevalence Test Morphological Ad		
Pedicularis verticillata		1			supporting data in Rema		rate sheet)
5. Carex podocarpa		10		FAC		ophytic Vegetatio	
					'Indicators of hydric so		
Equisetum scirpoides		2		FACU	be present unless distu		
<u>r</u>				-			
8.		20.2					
	50% of total co	Total Cover: 90 over: 45 20%	of total cover.	18	Hydrophytic Vegetation	Present?	/on
Plot size (radius, or length x		% Bare Ground			Jarophytic vegetation	1 1000III.	es es
% Cover of Wetland Bryoph	ytes:	Total Cover of Br	yophytes:	20			

Sampling Point:

14-22 1 Type: C=Co Hydric Soil I Histosol Histic Ep	.5 YR 2.5/1 0 YR 4/1 oncentrations, Dendicators:	70 2.5	R 3/1 YR 3/2	20 30	RM RM	M	sandy loam	mostly roots and decomposin	
14-22 1 Type: C=Co Hydric Soil I Histosol Histic Ep	0 YR 4/1	70 2.5	***					Organics/soil mix - high % of	
Type: C=Co Hydric Soli I	oncentrations, D		YR 3/2	30	RM	M	the same of		
Hydric Soil I		=Depletions					loamy sand	Organics/soil mix	
Histosol	ndicators:		RM=Reduce	d Matrix.	2Locatio	on: PL=Po	ore Linings, RC=Root	Channel, M=Matrix	
☐ Histic Ep			Indica	tors for Prob	lematic H	ydric Soll	S3:		
	or Histel (A1)		Г	Alaska Color	Change (T	A4)4	Г	Alaska Gleyed Without Hue 5Y or	
To Charles and	Histic Epipedon (A2) Alaska Alpine Swales (TA5)				Redder Underlying Layer				
X Hydroge	n Sulfide (A4)			Alaska Redox	With 2.5Y	Hue	Г	Other (Explain in Remarks)	
Thick Da	ark Surface (A12	2)							
	Gleyed (A13)		₃One I	ndicator of hyd	drophytic v	egetation	, one primary indicato	r of wetland hydrology,	
The St. V. S. V.	Redox (A14)					10 to	nust be present.		
Alaska (Sleyed Pores (A	15)	4Give	details of color	change in	Remarks	i.		
Restrictive La	yer (if present):	none ence	ountered				Hydric Solis Pre	esent? Yes	
2							nyunc sons rie	South 100	
Depth:									
DROLOGY etland Hydro	(logy indicators		Train to				Secondary In	dicators (2 or more required)	
S 74777 M.	ors (any one indi	cator is suff	O Lawren		_			ined Leaves (B9)	
Surface V		1		oil Cracks (B6)		- (0.7)	Drainage Salt Depo	Patterns (B10)	
	er Table (A2)	1		Visible on Ae		C 400 C 500		Rhizospheres on Living Roots (C3	
Saturation Water Ma			The state of the state of the	egetated Cond Sulfide Odor (ice (Bo)	The state of the s	of Reduced Iron (C4)	
	Deposits (B2)	-		n Water Table			Stunted of	or Stressed Plants (D1)	
Drift Depo		-		lain in Remark	,			Aquitard (D3)	
	ust of Algae or N	lart (B4)	Ottici (EA)	, and the state of	,		The state of the s	phic Position (D2) ographic Relief (D4)	
Iron Depo								itral Test (D5)	
							A		
eld Observat	ions:					-	- i -		
face Water Pi	esent?	No		Depth (inch	nes):				
ter Table Pres	sent?	Yes		Depth (inch	nes):	2	Wetland Hydro	ology Present? Yes	
uration Prese	nt?	Yes	-	Depth (inch	ies):	0			
cludes capilla	y fringe)								
ascribe Recor	ded Data (stream	m gauge, m	onitoring well,	aenal photos,	previous i	nspection	s), if available:		

Print Form

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Development	t Project Borough/Cil	ty:North Slo	ре		Sampling Da	te Aug 9, 20
Applicate/Owner: Brooks Range Petro	oleum				Camplina Da	int: B-29
Investigator(s): JBrekken, JO'Brien	La	andform (hills	ide, terrace,	Huumock,	etc: hummocks and tr	
Local Relief (concave, convex, none):	slightly convex	Slo	pe (%): <1			
Subregion:	Lat:		Long:		Datum:	
Are climate/hydrologic conditions on the	site typical for this tim	e of year? Ye	es			
Are Vegetation?,No Soil? No	or Hydrocabon?	No	significantly	disturbed?	Are "Normal Circumstances" Preser	nt? Yes
Are Vegetation?, No Soil? No	or Hydrocabon?	No	naturally pro	oblematic?	(If needed, explain any answers in Rema	rks)
SUMMARY OF FINDINGS - Attach site	a map showing samp	ling point lo	cations, tra	nsects, Imp	portant features, etc.	
Hydrophytic Vegetation Present?	Yes		ampled Area			
Hydric Soils Present?	Yes	within a	Wetland?	Yes		
Wetland Hydrology Present?	Yes					
Remarks: Well-drained tundra						
VEGETATION (List all species	in plot)				4.6-3-3-3	
Tree Stratum (Use scientific names)		Absolute %Cover	Dominant Species	Indicator Status	Dominance Test worksheet:	
1.			- Parity		Number of Dominant Species That Are OBL, FACW, or FAC: 1	(A)
2.					Total Number of Dominant	- ''
3.					Species Across All Strata: 2	(B)
4.					Percent of Dominant Species	(A.M)
	Total C	Cover:			That Are OBL, FACW, FAC: 50 Prevalence Index:	(A/B)
Sampling/Shrub Stratum	50% of total cover:		of total cover:	5-0	Total % Cover of: Multiplied by:	
Salix reticulata		3		EAC	OBL Species 45 x 1 = 45	
2. Salix planifolia		5		FACW	FACW Species 9 x 2 = 18	
3. Dryas integrifolia		30	Yes	FACU	FAC Species 10 x 3 = 30	
4. Cassiope tetragona		2		FACU	FACU Species 34 x 4 = 13 UPL Species 0 x 5 = 0	6
5.					UPL Species $0 \times 5 = 0$ Column Totals: $98 \times (A) = 22$	9 (B)
6.					- V V	
	Total C	Cover: 40			Prevalence Index = B/A = 2.34	
Herb Stratum	50% of total cover: 20	20%	of total cover:	8		
Eriophorum angustifolium		45	Yes	OBL	Hydrophytic Vegetation Indicato	rs:
Oxytropis nigrescens		5		NI	Dominance Test is >50%	
3. Carex scirpoidea		2		FACU	Prevalence Test is ≤3.0 Morphological Adaptions' (Prov	ida
4. Carex saxatilis		2		7	supporting data in Remarks or on a s	
				LISELI	Problematic Hydrophytic Veget	
5. Saussurea angustifolia		2		FAC	'Indicators of hydric soil and wetland	d hydrology must
6. Pyrola grandifolia		2		FAC	be present unless disturbed or proble	emic.
7. Carex capillaris		2		FACW		
8. Polygonum viviparum	5.00	3		FAC		
Plot size (radius, or length x width) 15	50% of total cover: 31	Cover: 63 1.5 20% o are Ground:	of total cover;	12.6	Hydrophytic Vegetation Present?	Yes
% Cover of Wetland Bryophytes:	Total C	Cover of Bryo	ophytes:	10		

Remarks: White crustose and fruticose lichens present.

SOIL

Sampling Point:

B-29

Depth (Inches)	Matrix Color (moist)	ribe to	the depth needed to Redox Features Color (moist)	docume %	Type1	Loc2	Texture Remarks	s Remarks
0-2								Duff and organic material
2-6	10 YR 2/1	100		-			loamy sand	Organics/soil mix
6-14	7.5 YR 2.5/1	95	2.5 YR 3/6	5	RM	PL	loamy sand	Partially decomposed plant m
14-17	2.5 YR 3/1	65	7.5 YR 2.5/1	35	RM	PL/M	loamy sand	Dark streaks in soil
17-21	7.5 YR 2.5/1	60	2.5 Y 4/2	40	RM	PL/M	peat-like	Decomposing roots and organ
1Type: C	=Concentrations, [)=Deple	etions, RM=Reduced M	atrix.	2Locatio	on: PL=Po	ore Linings, RC=Ro	ot Channel, M=Matrix
Hydric S	oll Indicators:		Indicators	for Prob	ematic H	ydric Soll	S3;	
X Histo	osol or Histel (A1)		☐ Ala	ska Color	Change (1	A4)4	F	Alaska Gleyed Without Hue 5Y or
Histi	c Epipedon (A2)		┌ Ala	ska Alpine	Swales (TA5)	,	Redder Underlying Layer
☐ Hydr	rogen Sulfide (A4)		Ala	ska Redo	x With 2.5	Hue	Г	Other (Explain in Remarks)
Thic	k Dark Surface (A1	2)						,,
	ka Gleyed (A13)		3One India	ator of hy	drophytic	egetation,	one primary indica	tor of wetland hydrology,
	ka Redox (A14)		and an ap	propriate	landscape	position m	ust be present.	
100	ka Gleyed Pores (A	A15)			r change in		0.0.22.48577	
Restrictiv	e Layer (if present)	froze	ín				0000000	estimak Poss
	ave. n.						Hydric Solls P	resent? Yes
Depth:	21" bgs	_						
Primary Indi Surface High V Satura	rdrology Indicator icators (any one ind the Water (A1) Water Table (A2) ation (A3) Marks (B1)		s sufficient) Surface Soil C Inundations Vis Sparsely Vege Hydrogen Sulf	ible on A	erial Image ncave Surfa	2.	Water S Drainag Salt De Oxidize	Indicators (2 or more required) tained Leaves (B9) ge Patterns (B10) posits (C5) d Rhizospheres on Living Roots (C3
Drift D	pent Deposits (B2) Deposits (B3) of Crust of Algae or Deposits (B5)	Marl (B4	Dry Season W Other (Explain				Stunted Shallow Geomo	ce of Reduced Iron (C4) If or Stressed Plants (D1) If Aquitard (D3) If Position (D2) If Pographic Relief (D4) If Post (D5)
Drift D Mat of	Deposits (B3) f Crust of Algae or deposits (B5)	Marl (B4	Other (Explain				Stunted Shallow Geomo	or Stressed Plants (D1) Aquitard (D3) Aphic Position (D2) Appropriate (D4)
Drift D Mat of Iron D	Deposits (B3) f Crust of Algae or Deposits (B5) rvations:	Ĺ	Other (Explain		rks)		Stunted Shallow Geomo	or Stressed Plants (D1) Aquitard (D3) Aphic Position (D2) Appropriate (D4)
Drift D Mat of Iron D Field Observate Water	Deposits (B3) f Crust of Algae or deposits (B5) rvations: ar Present?	<u> </u>	Other (Explain	in Rema	rks)		Stunted Shallov Geomo Kicroto	or Stressed Plants (D1) Aquitard (D3) Aphic Position (D2) Appropriate (D4)
Drift D Mat of Iron D Field Obserurface Water atter Table I	Deposits (B3) f Crust of Algae or deposits (B5) rvations: or Present? Present?	F	Other (Explain	in Rema	hes):	3	Stunted Shallov Geomo Kicroto	or Stressed Plants (D1) Aquitard (D3) Aphic Position (D2) Appropriate (D4) Appropriate (D5)
Drift D Mat of Iron D Field Obser urface Water Vater Table I aturation Pr ncludes cap	Deposits (B3) If Crust of Algae or Deposits (B5) Invations: In Present? Present? Descriptions:	ام ام	Other (Explain	Depth (inc	hes): hes):	3 inspection	Stunted Shallow Geomo KMicroto FAC-No	or Stressed Plants (D1) Aquitard (D3) Aphic Position (D2) Appropriate (D4) Appropriate (D5)

Print Form

WETLAND DETERMINATION DATA FORM - Alaska Region

Project Site: Mustang Developmen		y:North SI	ope			Sampling Date	Aug 9, 2
Applicate/Owner: Brooks Range Petr	oleum		1.10		7.6 7.83	Sampling Point	B-30
Investigator(s): JBrekken, JO'Brien		ndform (hill:	side, terrace	, Huumock, e	etc: hummocks	Sampling Form	
Local Relief (concave, convex, none):	flat	Sid	ope (%): <	Į.			
Subregion:	Lat:		Long		Datum:		
Are climate/hydrologic conditions on the	e site typical for this time	e of year? Y	es				
Are Vegetation?,No Soil? No	or Hydrocabon?	No	significantly	y disturbed?	Are "Normal Circum		
Are Vegetation?, No Soil? No	or Hydrocabon?	No	naturally pr	oblematic?	(If needed, explain any	answers in Remarks	
SUMMARY OF FINDINGS - Attach sit	e map showing sampl	ing point k	ocations, tr	ansects, Imp	oortant features, etc		
hydrophytic Vegetation Present?	Yes		Sampled Are Wetland?				
Hydric Soils Present?	Yes	within a	a vvenanu?	165			
Netland Hydrology Present?	Yes						
Remarks: DP between two lakes							
/EGETATION (List all species	s in plot)				Acres and a		
Tree Stratum (Use scientific names)		Absolute % Cover	Dominant	Indicator	Dominance Test we	orksheet	
1		%Cover	Species	Status	Number of Dominan That Are OBL, FACV		(A)
2.					Total Number of Dor	-	_ ,,
3.					Species Across All S		(B)
A.					Percent of Dominant		
3.	Total C	over			That Are OBL, FAC		(A/B)
Sampling/Shrub Stratum	50% of total cover:		of total cover		Total % Cover of:	TA C. D. A.D.	
1. Salix reticulata		3	Yes	FAC	OBL Species 41	x 1 = 41	
2. Salix planifolia		2	Yes	FACW	FACW Species 19	x 2 = 38	
3. Salix niphoclada (brachycarpa)		4	Yes	EAC	FAC Species 37	x3= 111	
4.					FACU Species 0	x4= 0	
5.					UPL Species 0 Column Totals: 97	x 5 = 0 (A) 190	(B)
6.					Coldini Totals. 97		_
	Total C	over: 9			Prevalence Index =	B/A = 1.96	
Herb Stratum	50% of total cover: 4.5	20%	of total cover:	1.8			
Eriophorum angustifolium		40	Yes	OBL	Hydrophytic Vege		
2. Eriophorum vaginatum		10	.2.25	FACW	Dominance Te		
3. Carex podocarpa		25	Yes	FAC	Prevalence Te	st is≤3.0 Adaptions' (Provide	
		1	134		supporting data in Re		
4. Saxifraga hirculus				201		drophytic Vegetati	NUMBER OF THE STATE OF
5. Pedicularis sudetica		2		FACW	'Indicators of hydric	soil and wetland h	ydrology musi
6. Saxifraga oppositifolia		3		FAC	be present unless di		
7. Polygonum viviparum		2		EAC			
8. Carex capillaris	36.5	5		FACW			
	Total C 50% of total cover: 44	over: 88	of total cover:	17.6	Hudrophytic Vogotati	on Drocont?	V
Plot size (radius, or length x width) 15		are Ground:		,0	Hydrophytic Vegetation	Jii Fresent?	Yes
% Cover of Wetland Bryophytes:	Total C	over of Bry	ophytes:	10			

-	_	

Sampling Point:

B-30

(Inches)	Color (moist)	%	Color (moist)	%	- 1	eı Locz	Texture Remarks	2.75.0
0-9								Peat-like layer
9-21	Gleyed (3+ val	100					sandy loam	Organic deposits (partially de
	Section and the section of the secti	F. W. 1851 11	0.212.70			TWO STATES		
0.4(3) *2**	Concentrations, D	=Depletion						ot Channel, M=Matrix
Hydric So	Il Indicators:		Indic	ators for P	robiemati	c Hydric Soi	ls:	
Abel College	sol or Histel (A1)		П	Alaska Co		-1.1.0	Г	Alaska Gleyed Without Hue 5Y or
	Epipedon (A2)			Alaska Alp				Redder Underlying Layer
10.3	ogen Sulfide (A4)			Alaska Re	dox With 2	2.5Y Hue		Other (Explain in Remarks)
Marine Street	Dark Surface (A1:	2)		in all the second		da la	e and the second	
	a Gleyed (A13)							tor of wetland hydrology,
	a Redox (A14)	44					nust be present.	
Alask	a Gleyed Pores (A	15)	4GIVE	details of c	olor chang	e in Remark	S.	
Doctriction	Layer (if present):	frozen					Hydric Solls P	resent? Yes
Restrictive							injune como i	10001111
	24" bas	-						
Depth: 2	21" bgs							
Depth: 2		· · · · · · · · · · · · · · · · · · ·					Secondary	ndicators (2 or more required)
Depth: 2 emarks: YDROLOG Votland Hyd	GY		fficient)_					indicators (2 or more required) tained Leaves (B9)
Depth: 4	GY frology Indicator		Surface S	Soil Cracks (1.1 (2.0)		Water St	ained Leaves (B9) e Patterns (B10)
Depth: 4 PMOLOG Wetland Hydrimary Indice Surface High W	GY drology indicators ators (any one ind a Water (A1) ater Table (A2)		Surface S Inundation	ns Visible on	Aerial Ima		Water St Drainag Salt De	tained Leaves (B9) te Patterns (B10) toosits (C5)
Depth: 4 PMOLOG Wetland Hyd Trimary Indic Surface High W Saturati	GY frology Indicators ators (any one ind Water (A1) fater Table (A2) ion (A3)		Surface S Inundation Sparsely	ns Visible on Vegetated C	Aerial Ima Concave S		Water St Drainag Salt Dep Oxidize	rained Leaves (B9) re Patterns (B10) re Posits (C5) d Rhizospheres on Living Roots (C
Depth: 2 Properties Properties Primary Indicate Surface High W Saturati Water M	GY frology Indicators ators (any one ind a Water (A1) fater Table (A2) ion (A3) Marks (B1)		Surface S Inundation Sparsely	ns Visible on	Aerial Ima Concave S		Water St Drainag Salt Dep Oxidizer Presence	tained Leaves (B9) the Patterns (B10) the Patterns (B10) the posits (C5) the Reduced Iron (C4)
Depth: 2 Properties Properties Primary Indicate Surface High W Saturati Water M	GY frology Indicators ators (any one ind Water (A1) fater Table (A2) ion (A3)		Surface S Inundation Sparsely Hydrogen	ns Visible on Vegetated C	Aerial Ima Concave S or (C1)		Water St Drainag Salt Dep Oxidizer Presence Stunted	cained Leaves (B9) the Patterns (B10) the Patterns (B10) the posits (C5) the Reduced Iron (C4) the Stressed Plants (D1)
Popth: 4 Popth:	GY drology Indicators ators (any one indicators (A1) ater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) aposits (B3)	icator is sur [[[[[Surface S Inundation Sparsely Hydroger Dry Seas	ns Visible on Vegetated C n Sulfide Ode	Aerial Ima Concave S or (C1) able (C2)		Water St Drainag Salt Dep Oxidize Presend Stunted Shallow	tained Leaves (B9) the Patterns (B10) the Patterns (B10) the posits (C5) the Reduced Iron (C4)
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Pepth: 4 Pemarks: POROLOG Vetland Hyd Trimary Indic Surface High W Saturati Water M Sedime Drift De Iron De Iron De Iteld Observer Atter Table Procludes capil	GY Irology Indicators ators (any one indicators (any one indicators) Water (A1) Idea Table (A2) Idea (A3) Marks (B1) Int Deposits (B2) Imposits (B3) Crust of Algae or Marcons: Present? Iresent?	Icator is sur	Surface S Inundation Sparsely Hydrogen Dry Seas Other (Ex	Depth (Depth (Aerial Ima Concave S or (C1) able (C2) marks) inches): inches):	14 0	Water St Drainag Salt Dep Oxidized Presend Stunted Shallow Geomod X Microto X FAC-Ne	rained Leaves (B9) re Patterns (B10) re of Reduced Iron (C4) re of Reduced Iron (C4) re Stressed Plants (D1) re Aquitard (D3) rephic Position (D2) repographic Relief (D4) resultal Test (D5)

APPENDIX D

Select Photographs of Determination Points



В1



SOIL PROFILE



VIEW EAST



SOIL PROFILE



VIEW EAST



SOIL PROFILE



VIEW NORTH



SOIL PROFILE



VIEW SOUTH



SOIL PROFILE



VIEW NORTH



SOIL PROFILE



VIEW EAST



SOIL PROFILE



GROUND VIEW



SOIL PROFILE



VIEW WEST



SOIL PROFILE



GROUND VIEW



SOIL PIT



VIEW NORTH



SOIL PROFILE



VIEW EAST



SOIL PROFILE



VIEW EAST



SOIL PROFILE



VIEW SOUTH



SOIL PROFILE



VIEW NORTH



SOIL PROFILE



VIEW NORTH



SOIL PIT



VIEW EAST



SOIL PROFILE



VIEW WEST



SOIL PROFILE AND PIT



VIEW NORTH



SOIL PROFILE



VIEW NORTH



SOIL PROFILE



VIEW EAST



SOIL PROFILE



VIEW EAST



SOIL PROFILE



VIEW NORTH



SOIL PROFILE



VIEW EAST



SOIL PROFILE



VIEW NORTH



SOIL PROFILE



GROUND VIEW



SOIL PROFILE



VIEW NORTH



SOIL PROFILE



VIEW NORTH



SOIL PROFILE



VIEW SOUTH



SOIL PROFILE



GROUND VIEW



SOIL PROFILE



VIEW NORTH

APPENDIX E

Arctic Coastal Plain Species List



PLANT SPECIES OBSERVED IN ASSESSED AREA DURING SITE VISIT

Scientific Name	Common Name	Indicator Status	Synonyms
Agropyron boreale	Alaska wheatgrass	-	
Alopecurus alpinus	boreal alopecurus	FACW	
Arctagrostis latifolia	wideleaf polargrass	FACW	
Calamagrostis purpurascens	purple reedgrass	-	
Carex aquatilis	water sedge	OBL	
Carex bigelowii	Bigelow's sedge	FAC	
Carex capillaris	hair-like sedge	FACW	
Carex membranacea	fragile sedge	FACW	
Carex obtusata	obtuse sedge	-	
Carex podocarpa	shortstalk sedge	FAC	
Carex rariflora	looseflower alpine sedge	OBL	
Carex saxatilis	rock sedge	FACW	
Carex scirpoidea	northern singlespike sedge	FACU	
Carex vaginata	sheathed sedge	OBL	
Cassiope tetragona	white arctic mountain heather	FACU	
Draba alpina	whitlow grass	-	Alpine draba
Dryas integrifolia	entireleaf mountain-avens	FACU	
Dupontia fisheri	Fisher's tundragrass	FACW	
Equisetum arvense	field horsetail	FACU	
Equisetum scirpoides	dwarf scouringrush	FACU	
Eriophorum angustifolium	tall cottongrass	OBL	
Eriophorum vaginatum	cotton grass, tussock	FACW	
Festuca rubra	red fescue	FAC	
Juncus arcticus	arctic rush	OBL	
Juncus biglumis	twoflowered rush	OBL	
Melandrium affine	arctic catchfly	-	
Oxytropis nigrescens	blackish oxytrope	-	
Papaver macounii	Macoun's poppy	FACU	
Pedicularis sudetica	sudetic lousewort	FACW	
Pedicularis verticillata	whorled lousewort	FAC	
Poa arctica	arctic bluegrass	FAC	
Polemonium acutiflorum	tall Jacob's ladder	FAC	
Polygonum bistorta	meadow bistort	FAC	
Polygonum viviparum	viviparous knotweed	FAC	
Pyrola grandiflora	largeflowered wintergreen	FAC	
Salix arctica	arctic willow	FAC	
Salix fuscescens	Alaska bog willow	FACW	
Salix glauca	grayleaf willow	FAC	
Salix niphoclada	barrenground willow	FAC	Salix brachycarpa
Salix ovalifolia	oval-leaf willow	FAC	
Salix planifolia	diamondleaf willow	FAC	
Salix reticulata	netleaf willow	FAC	

Scientific Name	Common Name	Indicator Status	Synonyms
Salix rotundafolia	least willow	-	
Saussurea angustifolia	narrowleaf saw-wort	FAC	
Saxifraga hirculus	yellow marsh saxifrage	OBL	
Saxifraga oppositifolia	East Greenland saxifrage	FAC	
Saxifraga rivularis	weak saxifrage	OBL	
Silene acaulis	moss campion	UPL	
Vaccinium vitis-idaea	lingonberry	FAC	

⁻ Species not included on official published list of plant species for Alaska (USFWS 1988)

POTENTIAL MAMMAL SPECIES OF THE ARCTIC COASTAL PLAIN

Order Ursid

Polar bear (*Ursus maritimus*) Grizzly bear (*Ursus arctos*)

Order Canid

Wolf (Canis lupus)
Coyote (Canis latrans incolatus)
Red fox (Vulpes vulpes)
Arctic fox (Alopex lagopus)

Order Cervid

Moose (*Alces alces*)
Caribou (*Rangifer tarandus*)

Order Bovid

Muskoxen (Ovibos moschatus)

Order Mustelid

Ermine (Mustela erminea)
Least weasel (Mustela rixosa)
Wolverine (Gulo gulo)

Order Lagomorpha

Alaskan hare (Lepus othus)

Order Rodentia

Arctic ground squirrel (Spermophilus parryii)
Singing Vole (Microtus miurus)
Northern Red-backed Vole (Clethrionomys rutilus)
Brown lemming (Lemmus sibiricus)
Collared lemming (Dicrostonyx groenlandicus)

Order Insectivora

Masked Shrew (*Sorex cinereus*) Dusky Shrew (*Sorex monticolus*) Arctic Shrew (*Sorex arcticus*)



POTENTIAL FRESHWATER FISH FOUND WITHIN THE ARCTIC COASTAL PLAIN*

Sheefish (Stenodus leucichthys)

Round whitefish (Prosopium cylindraceum)

Lake Trout (Salvelinus namaycush)

Arctic Char (Salvelinus alpinus)

Northern Pike (Esox lucius)

Lake Chub (Couesius plumbeus)

Longnose Sucker (Catostomus catostomus)

Trout-perch (*Percopsis omiscomaycus*)

Burbot (*Lota lota*)

Ninespine Stickleback (*Pungitius pungitius*)

Slimy Sculpin (*Cottus cognatus*)

Threespine Stickleback (Gasterasteus aculeatus)

Alaska Blackfish (Dallia pectoralis)

Arctic Grayling (Thymallus arcticus)

Arctic Lamprey (Lampetra japonica)

Pacific Herring (Clupea pallasi)

Least Cisco (Coregonus sardinella)

Arctic Cisco (Coregonus autumnalis)

Round whitefish (Prosopium cylindraceum)

Broad whitefish (*Coregonus nasus*)

Humpback whitefish (Coregonus pidschian)

Dolly Varden (Salvelinus malma)

Pink salmon (Oncorhynchus gorbuscha)

Chum salmon (Oncorhynchus keta)

Pond smelt (*Hypomesus olidus*)

Rainbow smelt (Osmerus mordax)

Arctic cod (Boreogadus saida)

(*Species from Morrow, 1980)

POTENTIAL BIRD SPECIES FOUND WITHIN THE ARCTIC COASTAL PLAIN*

Order Anseriformes

Greater White-fronted Goose (*Anser albifrons*)

Snow Goose (Chen caerulescens)

Ross's Goose (Chen rossii)

Tundra Swan (Cygnus columbianus)

Gadwall (Anas strepera)

Eurasian Wigeon (Anas Penelope)

American Wigeon (Anas americana)

Mallard (*Anas platyrhynchos*)

Northern Shoveler (*Anas clypeata*)

Northern Pintail (Anas acuta)

Green-winged Teal (Anas crecca)

Canvasback (*Aythya valisineria*)

Greater Scaup (*Aythya marila*)

Lesser Scaup (*Aythya affinis*)

Steller's Eider (*Polysticta stelleri*)

Spectacled Eider (Somateria fischeri)

King Eider (Somateria spectabilis)

Common Eider (Somateria mollissima)

Harlequin Duck (Histrionicus histrionicus)

Surf Scoter (Melanitta perspicillata)

White-winged Scoter (*Melanitta fusca*)

Black Scoter (Melanitta nigra)

Long-tailed Duck (Clangula hyemalis)

Common Goldeneye (Bucephala clangula)

Smew (Mergellus albellus)

Red-breasted Merganser (Mergus serrator)

Order Galliformes

Willow Ptarmigan (Lagopus lagopus)

Rock Ptarmigan (*Lagopus mutus*)

Order Gaviiformes

Pacific Loon (Gavia pacifica)

Common Loon (Gavia immer)

Yellow-billed Loon (Gavia adamsii)

Red-throated Loon (*Gavia stellata*)

Order Podicipediformes

Horned Grebe (*Podiceps auritus*)

Red-necked Grebe (*Podiceps grisegena*)



Order Procellariiformes

Northern Fulmar (Fulmarus glacialis) Short-tailed Shearwater (Puffinus tenuirostris)

Order Falconiformes

Osprey (Pandion haliaetus)

Bald Eagle (Haliaeetus leucocephalus)

Northern Harrier (Circus cyaneus)

Sharp-shinned Hawk (*Accipiter striatus*)

Northern Goshawk (Accipiter gentiles)

Golden Eagle (Aquila chrysaetos)

Rough-legged Hawk (Buteo lagopus)

American Kestrel (Falco sparverius)

Merlin (Falco columbarius)

Gyrfalcon (Falco rusticolus)

Peregrine Falcon (Falco peregrinus)

Order Charadriiformes

Thick-billed Murre (*Uria lomvia*)

Black Guillemot (Cepphus grille)

Least Auklet (Aethia pusilla)

Horned Puffin (Fratercula corniculata)

Pomarine Jaeger (Stercorarius pomarinus)

Parasitic Jaeger (Stercorarius parasiticus)

Long-tailed Jaeger (Stercorarius longicaudus)

Bonaparte's Gull (Larus Philadelphia)

Mew Gull (Larus canus)

Herring Gull (*Larus smithsonianus*)

Thayer's Gull (Larus thayeri)

Slaty-backed Gull (*Larus schistisagus*)

Glaucous Gull (Larus hyperboreus)

Sabine's Gull (*Xeman sabini*)

Black-legged Kittiwake (Rissa tridactyla)

Ross' Gull (*Pagophila eburea*)

Ivory Gull (*Pagophila eburnean*)

Arctic Tern (Sterna paradisaea)

Black-bellied Plover (Pluvialis squatarola)

American Golden-Plover (*Pluvialis dominica*)

Semipalmated Plover (Charadrius semipalmatus)

Killdeer (Charadrius vociferous)

Red Phalarope (*Phalaropus fulicaria*)

Red-necked Phalarope (*Phalaropus lobatus*)

Wilson's Phalarope (*Phalaropus tricolor*)

Wilson's Snipe (Gallinago delicata)

Long-billed Dowitcher (Limnodromus scolopaceus)



Ruff (Philomachus pugnax)

Buff-breasted Sandpiper (Tryngites subruficollis)

Stilt Sandpiper (Calidris himantopus)

Dunlin (Calidris alpine)

Sharp-tailed Sandpiper (Calidris acuminata)

Pectoral Sandpiper (Calidris melanotos)

Baird's Sandpiper (Calidris bairdii)

White-rumped Sandpiper (Erolia fuscicollis)

Least Sandpiper (Calidris minutilla)

Red-necked Stint (Erolia ruficollis)

Western Sandpiper (Calidris mauri)

Semipalmated Sandpiper (Calidris pusilla)

Sanderling (*Calidris alba*)

Eurasian Dotterel (Charadrius morinellus)

Red Knot (Calidris canutus)

Ruddy Turnstone (*Arenaria interpres*)

Bar-tailed Godwit (Limosa lapponica)

Hudsonian Godwit (Limosa haemastica)

Black-tailed Godwit (Limosa limosa)

Whimbrel (Numenius phaeopus)

Upland Sandpiper (Actitis macularia)

Spotted Sandpiper (Actitis macularius)

Lesser Yellowlegs (*Tringa flavipes*)

Wandering Tattler (Heterosceles incanus)

Order Passeriformes

Hammond's Flycatcher (Empidonax hammondii)

Eastern Phoebe (Sayornis phoebe)

Say's Phoebe (Sayornis saya)

Eastern Kingbird (*Tyrannus tyrannus*)

Northern Shrike (*Lanius excubitor*)

Gray Jay (Perisoreus canadensis)

Common Raven (Corvus corax)

Horned Lark (*Eremophila alpestris*)

Tree Swallow (*Tachycineta bicolor*)

Violet-green Swallow (*Tachycineta thalassina*)

Bank Swallow (*Riparia riparia*)

Cliff Swallow (Petrochelidon pyrrhonota)

Barn Swallow (Hirundo rustica)

Bluethroat (*Luscinia svecica*)

Northern Wheatear (*Oenanthe oenanthe*)

Gray-cheeked Thrush (Catharus minimus)

Hermit Thrush (*Catharus guttatus*)

American Robin (*Turdus migratorius*)

Varied Thrush (*Ixoreus naevius*)

Yellow Wagtail (Motacilla flava)



American Pipit (Anthus rubescens)

Cedar Waxwing (Bombycilla cedrorum)

Orange-crowned Warbler (Vermivora celata)

Yellow Warbler (Dendroica petechia)

Yellow-rumped Warbler (*Dendroica coronata*)

Northern Waterthrush (Seiurus noveboracensis)

Wilson's Warbler (Wilsonia pusilla)

American Tree Sparrow (Spizella arborea)

Chipping Sparrow (Spizella passerine)

Savannah Sparrow (Passerculus sandwichensis)

Fox Sparrow (Passerella iliaca)

White-throated Sparrow (Zonotrichia albicollis)

White-crowned Sparrow (Zonotrichia leucophrys)

Dark-eyed Junco (Junco hyemalis)

Lapland Longspur (Calcarius lapponicus)

Smith's Longspur (Calcarius pictus)

Snow Bunting (*Plectrophenax nivalis*)

Red-winged Blackbird (Agelaius phoeniceus)

Rusty Blackbird (Euphagus carolinus)

Brown-headed Cowbird (*Molothrus ater*)

Common Redpoll (Carduelis flammea)

Hoary Redpoll (Carduelis hornemanni)

Pine Siskin (Carduelis pinus)

Order Coraciiformes

Belted Kingfisher (Ceryle alcyon)

Order Caprimulgiformes

Common Nighthawk (Chordeiles minor)

Order Apodiformes

Rufous Hummingbird (Selasphorus rufus)

Order Strigiformes

Snowy Owl (Bubo scandiacus)

Short-eared Owl (Asio flammeus)

Order Gruiformes

Sandhill Crane (Grus canadensis)

(*Species from ANWR, 2008 – includes species cited as north of the Brooks Range)



APPENDIX F

Preliminary JD Form



APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

C. PROJECT LOCATION AND BACKGROUND INFORMATION: The project spans approximately 9km and 2,014 acres and is

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

В.	DISTRICT	OFFICE.	. FILE NAME.	. AND NUMBER:

Dev	ated east of the Miluveach River and north of the Tarn Access Road in the North Slope Borough of Alaska. Please refer to the Mustang velopment Project Wetlands and Waters Technical Report (OASIS 2012) and Map Atlas for details of the waters and wetlands that are
ncl	luded in this form.
	State:Alaska County/parish/borough: North Slope Borough City: Center coordinates of site (lat/long in degree decimal format): Lat. 70.259dd° N, Long150.184dd° W. Universal Transverse Mercator: 7862372.535m N, 1053293.007m E
	Name of nearest waterbody: Miluveach River, a tributary to the Colville River
	Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Colville River
	Name of watershed or Hydrologic Unit Code (HUC): Colville HUC 19060304
	Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request. Check if other sites (e.g., offsite mitigation sites, disposal sites, etc) are associated with this action and are recorded on a different JD form.
D.	REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
	Office (Desk) Determination. Date: Field Determination. Date(s):
SE	CTION II: SUMMARY OF FINDINGS
	RHA SECTION 10 DETERMINATION OF JURISDICTION.
	ere Appear to be no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in review area. [Required]
	Waters subject to the ebb and flow of the tide. Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain: The nearest 'navigable' water is the Colville River which is not in the assessment area. According to the ADNR Navigable Waters Mapping Tool webiste, the navigability of the Miluveach River is 'unknown'. For the purpose of this JD analysis, we are assuming the Miluveach is an RPW.
В.	CWA SECTION 404 DETERMINATION OF JURISDICTION.
The	ere Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]
	1. Waters of the U.S.
	a. Indicate presence of waters of U.S. in review area (check all that apply): TNWs, including territorial seas
	Wetlands adjacent to TNWs
	Relatively permanent waters ² (RPWs) that flow directly or indirectly into TNWs
	 Non-RPWs that flow directly or indirectly into TNWs Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
	Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
	Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
	Wetlands adjacent to TNWs Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs Non-RPWs that flow directly or indirectly into TNWs Wetlands directly abutting RPWs that flow directly or indirectly into TNWs Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs Impoundments of jurisdictional waters Isolated (interstate or intrastate) waters, including isolated wetlands

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual

linear feet:

b. Identify (estimate) size of waters of the U.S. in the review area:

Elevation of established OHWM (if known):Unknown. .

2. Non-regulated waters/wetlands (check if applicable):³

width (ft) and/or 3.2 acres.

Non-wetland waters:

Wetlands: 2010.8 acres.

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

Supporting documentation is presented in Section III.F.

Potentially jurisdictiona Explain:	l waters and/or wetlands	s were assessed	within the review	area and determine	d to be not jurisdictional.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1.	TNW Identify TNW:	
	Summarize rationale supporting determination: .	
2.	Wetland adjacent to TNW Summarize rationale supporting conclusion that wetland is "adjacent":	

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: Pick List Drainage area: Pick List Average annual rainfall: inches Average annual snowfall: inches (ii) Physical Characteristics: (a) Relationship with TNW: Tributary flows directly into TNW. Tributary flows through **Pick List** tributaries before entering TNW. Project waters are **Pick List** river miles from TNW. Project waters are **Pick List** river miles from RPW. Project waters are **Pick List** aerial (straight) miles from TNW. Project waters are Pick List aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain: Identify flow route to TNW⁵: Tributary stream order, if known:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	General Tributary Characteristics (check all that apply): Tributary is: Natural Artificial (man-made). Explain: Manipulated (man-altered). Explain:
,	Tributary properties with respect to top of bank (estimate): Average width: feet Average depth: feet Average side slopes: Pick List.
]	Primary tributary substrate composition (check all that apply): Silts Sands Concrete Cobbles Gravel Muck Bedrock Vegetation. Type/% cover: Other. Explain:
]	Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Presence of run/riffle/pool complexes. Explain: Tributary geometry: Pick List Tributary gradient (approximate average slope): %
]	Flow: Tributary provides for: Pick List Estimate average number of flow events in review area/year: Pick List Describe flow regime: Other information on duration and volume:
;	Surface flow is: Pick List. Characteristics:
,	Subsurface flow: Pick List . Explain findings: Dye (or other) test performed:
	Tributary has (check all that apply): Bed and banks OHWM ⁶ (check all indicators that apply): clear, natural line impressed on the bank changes in the character of soil destruction of terrestrial vegetation the presence of wrack line shelving vegetation matted down, bent, or absent leaf litter disturbed or washed away sediment deposition destruction of terrestrial vegetation the presence of wrack line sediment sorting sediment sorting scour sediment deposition destruction of terrestrial vegetation the presence of wrack line sediment sorting scour multiple observed or predicted flow events abrupt change in plant community other (list): Discontinuous OHWM. ⁷ Explain:
	If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: Oil or scum line along shore objects Fine shell or debris deposits (foreshore) Physical markings/characteristics Other (list): Mean High Water Mark indicated by: Survey to available datum; Physical markings; Vegetation lines/changes in vegetation types.
Chara	mical Characteristics: cacterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.) Explain: Lify specific pollutants, if known:

(iii)

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷Ibid.

(iv) Biol	logical Characteristics. Channel supports (check all that apply): Riparian corridor. Characteristics (type, average width): Wetland fringe. Characteristics: Habitat for: Federally Listed species. Explain findings: Fish/spawn areas. Explain findings: Other environmentally-sensitive species. Explain findings: Aquatic/wildlife diversity. Explain findings:
2. Charact	eristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW
(a) ponds, and plu	Sical Characteristics: General Wetland Characteristics: Properties: Wetland size: 2,010.8 wetland acres Wetland type. Explain: Vegetaion and wetland communities inclue those associated with rivers, streams, lakes and a pastrine scrub-shrub / emergent wetlands. Wetland quality. Explain: Please refer to the Mustang Development Project Jurisdictional Determination Report and 2012) for results of the wetland delineation and analysis performed on project area wetlands by OASIS. Project wetlands cross or serve as state boundaries. Explain: N/A.
continuous se	General Flow Relationship with Non-TNW: Flow is: Perennial flow . Explain: For the purpose of this JD analysis, we are assuming the Miluveach River (RPW) has asonal flow to the Colville River (TNW) based on aerial photography. Refer to the Mustang Development Project Report and Maps (OASIS 2012).
predominantly	Surface flow is: Overland sheetflow Characteristics: Due to the different waterbody types within the assessment area, all flow types aplpy, but y overland flow. Refer to the Mustang Development Project Jurisdictional Report and Maps (OASIS 2012).
permafrost. T	Subsurface flow: Yes. Explain findings: In addition to potential surficial connections, wetlands within the ACP are also ave a hydrologic connection to TNWs and non-TNWs through adjacent soil saturation due in part to continuous shallow this condition can extend into adjacent wetlands for extended distances before encountering an RPW or TNW, an can link olated wetlands to streams and rivers that flow into large TNWs, and eventually into the Beaufort Sea. Dye (or other) test performed:
(c)	Wetland Adjacency Determination with Non-TNW: ☐ Directly abutting ☐ Not directly abutting ☐ Discrete wetland hydrologic connection. Explain: ☐ Ecological connection. Explain: ☐ Separated by berm/barrier. Explain:
(d)	Proximity (Relationship) to TNW Project wetlands are 15-20 river miles from TNW. Project waters are 5-10 aerial (straight) miles from TNW. Flow is from: Wetland to navigable waters. Estimate approximate location of wetland as within the 500-year or greater floodplain.
Cha	emical Characteristics: racterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Water quality varies, but is predominantly brown. https://doi.org/10.1001/j.j.j.j.j.j.j.j.j.j.j.j.j.j.j.j.j.j.j.
⊠ ⊠ (OASIS 2012	Habitat for:
Mustang Develop	 ☑ Federally Listed species. Explain findings:Potential habitat exists for polar bears and spectacled eiders. Refer to ment Project Environmental Report (OASIS 2012). ☑ Fish/spawn areas. Explain findings:Refer to Mustang Development Project Environmental Report (OASIS 2012). ☑ Other environmentally-sensitive species. Explain findings:Refer to Mustang Development Project Environmental
Report (OASIS 20	
2012).	

Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately () acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

<u>Directly abuts? (Y/N)</u> <u>Size (in acres)</u> <u>Directly abuts? (Y/N)</u> <u>Size (in acres)</u> see Table 2. SPN 2010-45 Multiple Waters Table in the Mustang Development Project Jurisdiction Report for a complete table listing the size, location and relationship with RPW.

Summarize overall biological, chemical and physical functions being performed: A complete wetland funtions and values analysis was performed for the assessment area wetlands. Refer to the Functional Assessment Report that is appended to the Environmental Report for this project. Assessment area wetlands were evaluated for the following 11 functions: 1) flood flow moderation and conveyance; 2) shoreline and bank stabilization; 3) maintenance of natural sediment transport processes; 4) production and export of organic matter; 5) maintenance of soil thermal regime; 6) waterbird support; 7) terrestrial mammal support; 8) fish support; 9) T&E species support (polar bears); 10) T&E species support (spectacled eider); and 11) scarce and valued habitats. Functions that were not evaluated, but are assumed to be performed by the assessment area wetlands include: nutrient and toxicant removal and sediment retention.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:N/A.
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: N/A.

D.	DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK AL
	THAT APPLY):

l.	TNWs and	Adjacent Wetlands.	Check all that	apply and provide size	ze estimates in review area:
	TNWs:	linear feet	width (ft), Or,	acres.	
	■ Wetlands	s adjacent to TNWs:	acres.		

2.	RPWs that flow directly or indirectly into TNWs. Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that
	tributary is perennial: Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: The navigability status of the Miluveach River is 'unknown' according to the ADNR Navigable Waters website mapping tool. For the purpose of this report, we are assuming the Miluveach is considered a RPW. Hydrologic data for the Miluveach was not available for this report; however flowing water is readily seen in the project aerials taken on July 10, 2010, which suggests continuous seasonal flow. Refer to Mustang Development Project Jurisdictional Report and Maps (OASIS 2012).
	Provide estimates for jurisdictional waters in the review area (check all that apply): Tributary waters: 4,326 linear feet 30-50 width (ft). Other non-wetland waters: acres. Identify type(s) of waters: .
3.	Non-RPWs ⁸ that flow directly or indirectly into TNWs. Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.
	Provide estimates for jurisdictional waters within the review area (check all that apply): Tributary waters: linear feet width (ft). Other non-wetland waters: acres. Identify type(s) of waters: .
4.	Wetlands directly abutting an RPW that flow directly or indirectly into TNWs. ✓ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands. ✓ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
	Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Assessment area wetlands are contiguous and directly abut the Miluveach River. They have a direct hydrologic connection to the Miluveach River (RPW) and ultimately to the Colville River (TNW) through seasonal flooding, continuous soil saturation, or shallow groundwater
	Provide acreage estimates for jurisdictional wetlands in the review area: 2010.8 acres.
5.	Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs. Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.
	Provide acreage estimates for jurisdictional wetlands in the review area: acres.
6.	Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs. Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.
	Provide estimates for jurisdictional wetlands in the review area: acres.
7.	Impoundments of jurisdictional waters. As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional. □ Demonstrate that impoundment was created from "waters of the U.S.," or □ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or □ Demonstrate that water is isolated with a nexus to commerce (see E below).

 $^{^8} See$ Footnote # 3. 9 To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

E.	ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY): which are or could be used by interstate or foreign travelers for recreational or other purposes. from which fish or shellfish are or could be taken and sold in interstate or foreign commerce. which are or could be used for industrial purposes by industries in interstate commerce. Interstate isolated waters. Explain: Other factors. Explain:
	Identify water body and summarize rationale supporting determination:
	Provide estimates for jurisdictional waters in the review area (check all that apply): Tributary waters: linear feet width (ft). Other non-wetland waters: acres. Identify type(s) of waters: . Wetlands: acres.
F.	NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY): If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements. Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce. Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR). Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: Other: (explain, if not covered above):
	Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply): Non-wetland waters (i.e., rivers, streams): linear feet width (ft). Lakes/ponds: acres. Other non-wetland waters: acres. List type of aquatic resource: Wetlands: acres.
	Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply): Non-wetland waters (i.e., rivers, streams): linear feet, width (ft). Lakes/ponds: acres. Other non-wetland waters: acres. List type of aquatic resource: . Wetlands: acres.
SEC	CTION IV: DATA SOURCES.
A.	SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below): Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Data sheets prepared/submitted by or on behalf of the applicant/consultant. Office concurs with data sheets/delineation report. Office does not concur with data sheets/delineation report. Data sheets prepared by the Corps: Corps navigable waters' study: U.S. Geological Survey Hydrologic Atlas: USGS NHD data. USGS 8 and 12 digit HUC maps. U.S. Geological Survey map(s). Cite scale & quad name: Harrison Bay B1 & A1 quadrangles, 1:250,000. USDA Natural Resources Conservation Service Soil Survey. Citation:

 $^{^{10}}$ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA $\it Memorandum~Regarding~CWA~Act~Jurisdiction~Following~Rapanos.$

\succeq	National wetlands inventory map(s). Cite name: Alaska Wetlands Mapper Dataset (National Wetlands Inventory).
	State/Local wetland inventory map(s): .
	FEMA/FIRM maps: .
	100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
\geq	Photographs: Aerial (Name & Date): Aerial date = July 10, 2010. Refer to the Mustang Development Project Jurisdictional
D	etermination Report and Maps (OASIS 2012).
	or 🔀 Other (Name & Date): Wetland delineation field photos taken in August 2011. Refer to the Mustang
D	evelopment Project Jurisdictional Determination Report and Maps (OASIS 2012).
	Previous determination(s). File no. and date of response letter:
	Applicable/supporting case law: .
\boxtimes	Applicable/supporting scientific literature:Refer to the reference section of the Mustang Development Project Jurisdictional
D	etermination Report and Maps (OASIS 2012).
	Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: