Alaska LNG

DOCKET NO. PF14-21-000 DRAFT RESOURCE REPORT NO. 8 LAND USE, RECREATION, AND AESTHETICS PUBLIC VERSION

Document Number: USAI-EX-SRREG-00-0008

	RESOURCE REPORT NO. 8 SUMMARY OF FILING INFORMATION ¹	
	Filing Requirement	Found in Section
1.	 Classify and quantify land use affected by: (§ 380.12(j)(1)) a. Pipeline construction and permanent rights-of-way (§ 380.12(j)(1)); b. Extra work/staging areas (§ 380.12(j)(1)); c. Access roads (§ 380.12(j)(1)); d. Pipe and contractor yards (§ 380.12(j)(1)); and e. Aboveground facilities (§ 380.12(j) (1)). • For aboveground facilities provide the acreage affected by construction and operation, acreage leased or purchased, and describe the use of the land not required for operation. 	8.2
2.	 Identify by milepost all locations where the pipeline right-of-way would at least partially coincide with existing right-of-way, where it would be adjacent to existing rights-of-way, and where it would be outside of existing right-of-way. (§ 380.12(j)(1)) This may apply to the offshore as well. 	Table 8.9-1
3.	Provide detailed typical construction right-of-way cross-section diagrams showing information such as widths and relative locations of existing rights-of-way, new permanent rights-of-way and temporary construction rights-of-way. (§ 380.12(j)(1))	Table 8.9-1, To be filed in a subsequent version of this Resource Report
4.	 Summarize the total acreage of land affected by construction and operation of the project. (§ 380.12(j)(1)) This applies to the offshore as well. 	8.2.3, Table 8.2.3-1
5.	 Identify by milepost all planned residential or commercial/business development and the time frame for construction. (§ 380.12(j)(3)) Identify all planned development crossed or within 0.25 mile of proposed facilities. 	8.3.3
6.	 Identify by milepost special land uses (i.e., maple sugar stands, specialty crops, natural areas, national and state forests, conservation land, etc.). (§ 380.12(j)(4)) This applies to the offshore as well, where it may include oyster and other shellfish beds, special anchoring or lightering areas, and shipping lanes. 	8.6.4
7.	 Identify by beginning milepost and length of crossing all land administered by Federal, state, or local agencies, or private conservation organizations. (§ 380.12(j)(4)) This applies to the offshore as well. 	8.5
8.	 Identify by milepost all natural, recreational, or scenic areas and all registered natural landmarks crossed by the project. (§ 380.12(j)(4&6)) This applies to the offshore as well. Identify areas within 0.25 mile of any proposed facility. 	8.6.
9.	Identify all facilities that would be within designated coastal zone management areas. Provide a consistency determination or evidence that a request for a consistency determination has been filed with the appropriate state agency. (§ 380.12(j)(4&7))	8.10
10.	Identify by milepost all residences that would be within 50 feet of the construction right- of-way or extra work area. (§ 380.12(j)(5))	8.3.1

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Filing Requirement	Found in Section	
 Identify all designated or proposed candidate National or State Wild and Scenic Rivers crossed by the project. (§ 380.12(j)(6)) 	8.6.1	
 Describe any measures to visually screen aboveground facilities, such as compressor stations. (§ 380.12(j)(11)) 	8.14	
 Demonstrate that applications for rights-of-way or other proposed land use have been or soon will be filed with Federal land-managing agencies with jurisdiction over land that would be affected by the project. (§ 380.12(j)(12)) 	SF 299 filed with BLM, final POD to be filed concurrent with FERC application	
Additional Information Often Missing and Resulting in Data Reque	sts	
Identify all buildings within 50 feet of the construction right-of-way or extra work areas. 8.3.1 8.3.2		
Describe the management and use of all public lands that would be crossed. 8.5		
Provide a list of landowners by milepost or tract number that corresponds to information on alignment sheets. To be filed under sepa		
Provide a site-specific construction plan for residences within 50 feet of construction.	To be filed in a subsequent version of this Resource Report	

¹ Guidance Manual for Environmental Report Preparation (FERC, August 2002). Available online at <u>http://www.ferc.gov/industries/gas/enviro/erpman.pdf</u>.

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Appendix B	Alaska LNG Visual Resources Study Plan
Appendix C	Contaminated Sites Mapbook (Provided under Separate Cover)
Appendix D	General Impacts from Similar Projects in Alaska

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ACRONYMS AND ABBREVIATIONS

ABBREVIATION	DEFINITION	
Abbreviations for Units of Measurement		
°C	degrees Celsius	
°F	degrees Fahrenheit	
BSCF/D	billion standard cubic feet per day	
cfs	cubic feet per second	
cm	centimeters	
dB	decibels	
dBA	A-weighted decibels	
ft	feet	
g	grams	
gpm	gallons per minute	
ha	hectare	
hp	horsepower	
Hz	hertz	
in	inches	
kg	kilogram	
kHz	kilohertz	
kW	kilowatts	
L _{dn}	day-night sound level	
L _{eq}	equivalent sound level	
L _{max}	maximum sound level	
m ³	cubic meters	
Ма	mega-annum (millions of years)	
mg	milligrams	
mg/L	milligrams per liter	
mg/m ³	milligrams per cubic meter	
MGD	million gallons per day	
mm	millimeters	
MMBtu/hr	million British thermal units per hour	
MMSCF/D	million standard cubic feet per day	
MPH	miles per hour	
MMTA	million metric tons per annum	
ng	nanograms	
ppb	parts per billion	
ppbv	parts per billion by volume	
ppm	parts per million	
ppmv	parts per million by volume	
Psig	pounds per square inch gauge	
rms	root mean square	
SPL	sound pressure level	
tpy	tons per year	

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ABBREVIATION	DEFINITION
hð	microgram
µg/kg	micrograms per kilogram
μPa	micropascals
Other Abbreviations	
§	section or paragraph
AAAQS	Alaska Ambient Air Quality Standards
AAC	Alaska Administrative Code
ACC	Alaska Conservation Corps
ACEC	Areas of Critical Environmental Concern
ACP	Arctic Coastal Plain
ACRC	Alaska Climate Research Center
ACS	U.S. Census, American Community Survey
AD	aggregate dock
ADCCED	Alaska Department of Commerce, Community, and Economic Development
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADGGS	Alaska Division of Geological and Geophysical Surveys
ADM	average daily membership
ADNR	Alaska Department of Natural Resources
ADOLWD	Alaska Department of Labor and Workforce Development
ADOT&PF	Alaska Department of Transportation and Public Facilities
AEIC	Alaska Earthquake Information Center
AES	Arctic Slope Regional Corporation Energy Service
AGDC	Alaska Gasline Development Corporation
AGPPT	Alaska Gas Producers Pipeline Team
AHPA	Alaska Historic Preservation Act
AHRS	Alaska Heritage Resources Survey
AIDEA	Alaska Industrial Development and Export Authority
AKNHP	Alaska Natural Heritage Program
AMP	approximate mile post
ANCSA	Alaska Native Claims Settlement Act
ANGPA	Alaska Natural Gas Pipeline Act
ANGTS	Alaska Natural Gas Transportation System
ANILCA	Alaska National Interest Lands Conservation Act
ANIMIDA	Arctic Nearshore Impact Monitoring in the Development Area
ANS Task Force	Aquatic Nuisance Species Task Force
ANVSA	Alaska Native Village Statistical Area
AOGCC	Alaska Oil and Gas Conservation Commission
AOI	Area of Interest
APCI	Air Products and Chemicals Inc.
APDES	Alaska Pollutant Discharge Elimination System
APE	Area of Potential Effect
API	American Petroleum Institute
APP	Alaska Pipeline Project

ABBREVIATION	DEFINITION
Applicants	ExxonMobil Alaska LNG LLC, ConocoPhillips Alaska LNG Company, BP Alaska LNG LLC, TransCanada Alaska Midstream LP, and Alaska Gasline Development Corporation
APSC	Alyeska Pipeline Service Company
AQRV	Air Quality Related Value
Arctic NWR	Arctic National Wildlife Refuge
ARD	acid rock drainage
ARDF	Alaska Resource Data File
ARPA	Archaeological Resources Protection Act of 1979
ARRC	Alaska Railroad Corporation
AS	Alaska Statute
ASAP	Alaska Stand Alone Pipeline
ASME	American Society of Mechanical Engineers
ASOS	Automated Surface Observation System
ASRC	Arctic Slope Regional Corporation
ATC	Allakaket Tribal Council
ATWS	additional temporary workspace
AWOS	Automated Weather Observing System
B.C.	British Columbia
BACT	Best Available Control Technology
BGEPA	Bald and Golden Eagle Protection Act
BIA	U.S. Department of the Interior, Bureau of Indian Affairs
BLM	U.S. Department of the Interior, Bureau of Land Management
BMP	best management practices
BOD₅	biochemical oxygen demand
BOEM	U.S. Department of the Interior, Bureau of Ocean Energy Management
BOG	boil-off gas
BP	Before Present
C.F.R.	Code of Federal Regulations
CAA	Clean Air Act
CAMA	Central Arctic Management Area
CCP	Comprehensive Conservation Plans
CDP	Census Designated Place
CEA	Chugach Electric Association
CERCLA	Comprehensive Environmental Response. Compensation, and Liability Act
CGF	Central Gas Facility
CGP	Construction General Permit
CH4	methane
CHA	Critical Habitat Area
CIRCAC	Cook Inlet Regional Citizens Advisory Council
CIRI	Cook Inlet Region Inc.
CLG	Certified Local Government
 CO	carbon monoxide

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ABBREVIATION	DEFINITION	
CO ₂	carbon dioxide	
CO ₂ e	total greenhouse gas emissions, in CO ₂ -equivalent global warming potential	
COC	Certificate of Compliance	
CONUS	Continental U.S.	
COOP	National Weather Service, Cooperative Observer Program	
CPCN	Certificate of Public Convenience and Necessity	
CRA	Certificate of Reasonable Assurance	
CSD	Contaminated Sites Database	
CSP	Contaminated Sites Program	
CSU	conservation system units	
CV	coefficient of variation	
CWA	Clean Water Act	
DB	Denali Borough	
DEM	Digital Elevation Model	
DGGS	ADNR Division of Geological and Geophysical Surveys	
DH	dock head	
DHSS	Alaska Department of Health and Social Services	
DMLW	Alaska Department of Natural Resources, Division of Mining, Land, and Water	
DPS	Distinct Population Segment	
DWPP	Drinking Water Protection Program	
EDA	U.S. Department of Commerce, Economic Development Administration	
EEZ	Exclusive Economic Zone	
EFH	Essential Fish Habitat	
EIS	Environmental Impact Statement	
EO	Executive Order	
EPA	U.S. Environmental Protection Agency	
EPRP	Emergency Preparedness and Response Plan	
ERL	Environmental, Regulatory and Lands	
ERMA	Extended Recreation Management Areas	
ESA	Endangered Species Act	
ESD	Emergency Shut Down	
ESU	Evolutionary Significant Unit	
FAA	U.S. Department of Transportation, Federal Aviation Administration	
FCC	Federal Communications Commission	
FE	U.S. Department of Energy, Office of Fossil Energy	
FEED	front-end engineering design	
FEIS	Final Environmental Impact Statement	
FEMA	U.S. Department of Homeland Security, Federal Emergency Management Agency	
FERC	U.S. Department of Energy, Federal Energy Regulatory Commission	
FERC Plan	FERC Erosion Control, Revegetation, and Maintenance Plan	
FERC Procedures	FERC Wetland and Waterbody Construction and Mitigation Procedures	
FLPMA	Federal Land Policy and Management Act (of 1976) BLM	
FMP	Fisheries Management Plan	

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ABBREVIATION	DEFINITION
FNSB	Fairbanks North Star Borough
FR	Federal Regulation
GDP	Gross Domestic Product
GHG	greenhouse gases
GIS	geographic information system
GMU	Game Management Units
GP	General Permit
GRI	Gas Research Institute
GTP	gas treatment plant
GWP	Global Warming Potential
H ₂ S	hydrogen sulfide
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HAP	Hazardous Air Pollutant
HAPC	Habitat Areas of Particular Concern
HCA	High Consequence Area
HDD	horizontal directional drill
HDMS	Hazard Detection and Mitigation System
HGM	hydrogeomorphic
HLV	heavy lift vessel
HMR	Hazardous Materials Regulations
HRS	Hazard Ranking System
IBA	Important Bird Areas
ICS	Incident Command System
IHA	Incidental Harassment Authorization
IHLC	Inupiat History, Language, and Culture
ILI	In-line Inspection
IMP	Integrity Management Plan
IP	Individual Permit
ISO	International Organization for Standardization
JPO	State and Federal Joint Pipeline Office
kbpd	thousand barrels per day
КСС	Kuparuk Construction Camp
КОР	key observation points
КРВ	Kenai Peninsula Borough
	light detection and ranging
	ngtural das liquofaction
	liquefied patural gas
LOD	

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ABBREVIATION	DEFINITION
LP	Limited Partnership
LPG	liquefied petroleum gas
LUP	Land Use Permit
LUST	Leaking Underground Storage Tanks
MACT	maximum achievable control technology
Mainline	An approximately 800-mile-long, large-diameter gas pipeline
MAOP	maximum allowable operating pressure
MARPOL	Marine Pollution Protocol
MBTA	Migratory Bird Treaty Act
MCD	marine construction dock
MHHW	mean higher high water
MHW	mean high water
ML&P	Anchorage Municipal Light and Power
MLA	Mineral Leasing Act
MLBV	Mainline block valve
MLLW	mean lower low water
MLW	mean low water
ММРА	Marine Mammal Protection Act
MMS	Mainline Meter Station
MOE	margin of error
MOF	material offloading facility
MP	Mainline milepost
MPRSA	Marine Protection Research and Sanctuaries Act of 1972
MSB	Matanuska-Susitna Borough
MSCFD	Thousand standard cubic feet per day
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAS	nonindigenous aquatic species
NCC	national certification corporation
NCDC	National Climatic Data Center
NDE	non-destructive examination
NEP	non-essential experimental population
NEPA	National Environmental Policy Act
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NFIP	National Flood Insurance Program
NGA	Natural Gas Act
NHPA	National Historic Preservation Act of 1996, as amended
NID	Negligible Impact Determination
NLURA	Northern Land Use Research Alaska, LLC
NMES	INational Oceanic and Atmospheric Administration, National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration

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ABBREVIATION	DEFINITION	
NOI	Notice of Intent	
North Slope	Alaska North Slope	
NPDES	National Pollutant Discharge Elimination Systems	
NPL	National Priority List	
NPP	National Park and Preserve	
NPR-A	National Petroleum Reserve – Alaska	
NPS	National Park Service	
NRCS	Natural Resources Conservation Service	
NRHP	National Register of Historic Places	
NSA	Noise-Sensitive Areas	
NSB	North Slope Borough	
NSPS	New Source Performance Standards	
NTC	national training center	
NTP	Notice to Proceed	
NVIC	Navigation and Vessel Inspection Circular	
NWA	Northwest Alaska Pipeline	
NWI	National Wetland Inventory	
NWR	National Wildlife Refuge	
O ₃	Ozone	
00	open-cut	
OCS	Outer Continental Shelf	
OD	outside diameter	
OEP	FERC, Office of Energy Projects	
OHA	ADNR Division of Parks and Outdoor Recreation, Office of History and Archaeology	
ONA	Outstanding Natural Area	
OPMP	ADNR, Office of Project Management and Permitting	
OU	Operating unit	
PAC	potentially affected community	
Pb	the element lead	
PBTL	Prudhoe Bay Gas Transmission Line	
PBU	Prudhoe Bay Unit	
PCB	polychlorinated biphenyl	
PHMSA	Pipeline and Hazardous Materials Safety Administration	
PM _{2.5}	particulate matter having an aerodynamic diameter of 2.5 microns or less	
PM ₁₀	particulate matter having an aerodynamic diameter of 10 microns or less	
PMP	Point Thomson Gas Transmission Line milepost	
POC	Plan of Cooperation	
POD	Plan of Development	
Project	Alaska LNG Project	
PRPA	Paleontological Resources Preservation Act	
PSD	Prevention of Significant Deterioration	
PTTL	Point Thomson Gas Transmission Line	
PTU	Point Thomson Unit	

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ABBREVIATION	DEFINITION
PWS	public water supply
Q&A	question and answer
RCA	Regulatory Commission of Alaska
RCRA	Resource Conservation and Recovery Act
RNA	Research Natural Area
ROD	Record of Decision
ROE	right-of-entry
ROW	right-of-way
RR	Resource Report
SCC	Deadhorse Airport
SDWA	Safe Drinking Water Act
SEIS	Supplemental Environmental Impact Statement
SGR	State Game Refuge
SHPO	State Historic Preservation Office(r)
SIP	State Implementation Plan
SMA	Special Management Areas
SRMA	Special Recreation Management Areas
SO ₂	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure Plan
SPCO	State Pipeline Coordinator's Office
SPLASH	Structure of Populations, Levels of Abundance, and Status of Humpbacks
SPMT	self-propelled module transporters
SRA	State Recreation Area
SRR	State Recreation River
STATSGO	State Soil Geographic
STATSGO2	State Soil Geographic2 – General Soils Map of Alaska & Soils Data (2011)
SWAPA	Southwest Alaska Pilots Association
SWPPP	Stormwater Pollution Prevention Plan
ТАНС	total aliphatic hydrocarbons
TAPS	Trans-Alaska Pipeline System
TBD	To be determined
TCC	Tanana Chiefs Conference
The Applicants' Plan	Applicants' Upland Erosion Control, Revegetation, and Maintenance Plan
The Applicants' Procedures	Applicants' Wetland and Waterbody Construction, and Mitigation Procedures
ТРАН	total polycyclic aromatic hydrocarbons
TSA	Transportation Security Administration
TSCA	Toxic Substances Control Act
TSD	tug support dock
TSS	total suspended solids
UCIDA	United Cook Inlet Drift Association
UIC	Underground Injection Control
U.S.	United States
U.S.C.	U.S. Code

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ABBREVIATION	DEFINITION	
USACE	U.S. Army Corps of Engineers	
USCG	U.S. Coast Guard	
USDA	U.S. Department of Agriculture	
USDHHS	U.S. Department of Health and Human Services	
USDOE	U.S. Department of Energy	
USDOI	U.S. Department of the Interior	
USDOT	U.S. Department of Transportation	
USDW	underground sources of drinking water	
USFS	U.S. Department of Agriculture, Forest Service	
USFWS	U.S. Department of the Interior, Fish and Wildlife Service	
USGS	U.S. Geological Survey	
VOC	volatile organic compound	
VPSO	Village Public Safety Officer	
VRM	Visual Resource Management Methodology	
VSM	Vertical Support Members	
WELTS	Well Log Tracking System	
WRCC	Western Regional Climate Center	
WSA	Waterway Suitability Assessment	
WSR	Wild and Scenic Rivers	

Information in this draft Resource Report, including maps, is preliminary and may change during Project pre-filing. Updated information will be provided in the subsequent draft and final versions of the Resource Reports.

8.0 RESOURCE REPORT 8 – LAND USE, RECREATION, AND AESTHETICS

8.1 **PROJECT DESCRIPTION**

The Alaska Gasline Development Corporation, BP Alaska LNG LLC, ConocoPhillips Alaska LNG Company, ExxonMobil Alaska LNG LLC, and TransCanada Alaska Midstream LP (Applicants) plan to construct one integrated LNG Project (Project) with interdependent facilities for the purpose of liquefying supplies of natural gas from Alaska, in particular the Point Thomson Unit (PTU) and Prudhoe Bay Unit (PBU) production fields on the Alaska North Slope (North Slope), for export in foreign commerce and opportunity for in-state deliveries of natural gas.

The Natural Gas Act (NGA), 15 U.S.C. § 717a(11) (2006), and FERC regulations, 18 C.F.R. § 153.2(d) (2014), define "LNG terminal" to include "all natural gas facilities located onshore or in State waters that are used to receive, unload, load, store, transport, gasify, liquefy, or process natural gas that is ... exported to a foreign country from the United States." With respect to this Project, the "LNG terminal" includes the following: a liquefaction facility (Liquefaction Facility) in Southcentral Alaska; an approximately 800-mile, large diameter gas pipeline (Mainline); a gas treatment plant (GTP) on the North Slope; a gas transmission line connecting the GTP to the PTU gas production facility (PTU Gas Transmission Line or PTTL); and a gas transmission line connecting the GTP to the PBU gas production facility (PBU Gas Transmission Line or PBTL). All of these facilities are essential to export natural gas in foreign commerce.

These components are shown in Resource Report No. 1, Figure 1.1-1, and their current basis for design is described below.

The new Liquefaction Facility will be constructed on the eastern shore of Cook Inlet in the Nikiski area of the Kenai Peninsula. The Liquefaction Facility will include the structures, equipment, underlying access rights and all other associated systems for pre-processing (other than that performed by the GTP) and liquefaction of natural gas, as well as storage and loading of LNG, including terminal facilities (dock) and auxiliary marine vessels used to support marine terminal operations (excluding LNG carriers). The Liquefaction Facility will include three liquefaction trains combining to process up to approximately 20 million metric tons per annum (MMTPA) of LNG. Three 160,000 cubic meter (m³) tanks will be constructed to store the LNG. The Liquefaction Facility will be capable of accommodating two LNG carriers. The size range of LNG carriers that the Liquefaction Facility will accommodate will be determined through further engineering study and consultation with the United States Coast Guard (USCG) as part of the Waterway Suitability Assessment (WSA) process.

In addition to the Liquefaction Facility, the LNG Terminal will include the following interdependent facilities:

• <u>Mainline</u>: A new large-diameter natural gas pipeline approximately 800 miles in length will extend from the Liquefaction Facility to the GTP on the North Slope, including the structures, equipment, and all other associated systems. The diameter of the pipeline has not been finalized but for the purpose of these resource reports a 42-inch diameter pipeline is assumed.

The Mainline will include compressor stations, heater stations, meter stations, and various mainline block valves; pig launcher and receiver facilities; and associated ancillary and auxiliary facilities. Ancillary and auxiliary facilities will include additional temporary work spaces, access roads, helipads, construction camps, pipe storage areas, contractor yards, material extraction sites, and material disposal sites. Along the Mainline route, there will be at least five off-take interconnection points to allow for the opportunity for future in-state deliveries of natural gas. The size and location of such interconnection points are unknown at this time. None of the potential third-party facilities used to condition, if required, or move natural gas away from these off-take points will be part of the Project.

- <u>GTP</u>: A new GTP and associated facilities in the Prudhoe Bay area will receive natural gas from the PBU Gas Transmission Line and the PTU Gas Transmission Line. The GTP will treat/process the natural gas for delivery into the Mainline. The Project also includes a new pipeline that will deliver natural gas processing byproducts from the GTP to the PBU.
- <u>PBU Gas Transmission Line</u>: A new natural gas transmission line will extend approximately one mile from the inlet flange of the GTP to the outlet flange of the PBU gas production facility.
- <u>PTU Gas Transmission Line</u>: A new natural gas transmission line will extend approximately 60 miles from the inlet flange of the GTP to the outlet flange of the PTU gas production facility.
- <u>Ancillary Facilities</u>: Existing State of Alaska transportation infrastructure will be used during the construction of these new facilities including ports, airports, roads, and airstrips (potentially including previously abandoned airstrips). The potential need for new infrastructure and modifications or additions to these existing in-state facilities is under evaluation. The Liquefaction Facility, Mainline, and GTP will require the construction of material offloading facilities.

Draft Resource Report No. 1, Appendices A and B contain general maps of the Project footprint. Detailed plot plans will be developed during the pre-front-end engineering and design (Pre-FEED) process and will be provided to the Commission in a subsequent draft of Resource Report No. 1. An update to the current list of affected landowners is being filed under separate cover as privileged and confidential information.

Outside the scope of the Project, but in support of, or related to, the Project, additional facilities or expansion/modification of existing facilities will be needed or may be constructed. These other projects may include:

- Modifications/new facilities at the PTU;
- Modifications/new facilities at the PBU;
- Relocation of the Kenai Spur Highway; and
- Third-party pipelines and associated infrastructure to transport natural gas from the off-take interconnection points to markets in Alaska.

8.1.1 Purpose of Resource Report

As required by 18 C.F.R. § 380.12, the Applicants have prepared this draft Resource Report in support of a future application under Section 3 of the NGA to construct and operate the Project facilities. The purpose of this draft Resource Report is to:

- Describe the existing land use, recreation and aesthetic resources located in the vicinity of the Project area;
- Assess the potential adverse effects to these resources resulting from Project construction and operation; and
- Identify potential general mitigation measures to avoid or minimize potential adverse effects identified.

Specific areas addressed include:

- Land use types;
- Floodplains;
- Coastal zone consistency;
- Residential and commercial areas;
- Natural, recreational, or scenic areas;
- Public or conservation lands;
- Special land use; and
- Aesthetic conditions.

The data for this draft Resource Report were compiled based on a review of the following:

- Engineering design and proposed construction plans;
- USGS topographic maps;
- Recent aerial photography;
- Field survey data; and
- Geographic Information System (GIS) data from federal and state agencies.

8.1.2 Agency and Organization Consultations

This section describes consultations conducted to date with federal and state agencies and other interested parties to the Alaska LNG Project. As Project details are refined in the Pre-FEED process currently underway, additional consultations will be conducted. A subsequent draft of this Resource Report will further describe these additional consultations.

8.1.2.1 Federal Agencies

Applicable Consultations/Permits

Due to the vast land holdings controlled and managed by the Bureau of Land Management (BLM) in the State of Alaska, close coordination and, in certain instances, regulatory filings with agencies such as BLM, U.S. Fish and Wildlife Service (USFWS), and U.S. Army Corps of Engineers (USACE) will be required. Coordination with federal agencies with jurisdiction over land use issues has occurred throughout the Project planning stages. A list of the required federal permits for the Project is provided in draft Resource Report No. 1, Appendix C. A summary of public, agency, and stakeholder engagement conducted by Alaska LNG Project Participants is provided in Resource Report No. 1, Appendix D and will be updated in subsequent report versions as additional input is solicited.

8.1.2.2 State Agencies

Applicable Consultations/Permits

The Applicants' representatives have had discussions with several State of Alaska representatives regarding the Project details. A list of the required State of Alaska permits for the Project is provided in draft Resource Report No. 1, Appendix C. A summary of public, agency, and stakeholder engagement conducted by Alaska LNG Project Participants is provided in Resource Report No. 1, Appendix C and will be updated in subsequent report versions as additional input is solicited.

8.2 LAND USE

This section describes the existing land use at each of the proposed Project facility locations, including land use characteristics unique to the State of Alaska.

8.2.1 Land Use Classification

Land use classifications were made using data from the National Land Cover Database 2001 (Homer et al., 2004) with land use types assigned based on the dominant vegetative cover and/or use of the land (e.g., cultivated land). Land use classification in the Project area was conducted for the Liquefaction Facility and Interdependent Facilities, which included a 2,000-foot wide pipeline study corridor and the GTP. Land use maps of the Project area are provided in Appendix A. The actual footprint of the Project facilities, including ancillary facilities, and their land requirements for construction and operation will be identified during the Pre-FEED process thus the acreage affected by construction and operations is not included in Draft 1 of this Resource Report. Those tracts of land identified herein may not become a part of the Project footprint. As details become available, land use within the Project footprint will be further defined and acreage information included in a subsequent draft of this Resource Report.

Six primary land use types were identified in the Project area including the following:

- Agricultural Land Agricultural land includes actively cultivated cropland and pasture/hay fields. Cultivated cropland areas are those used for the production of annual crops and orchards where crop vegetation accounts for greater than 20 percent of total vegetation. Pasture/hay fields areas are those where grasses and/or legumes are planted for livestock grazing or the production hay crops, where pasture/hay vegetation accounts for greater than 20 percent of total vegetation accounts for greater than 20 percent of total vegetation (NLCD codes 81 and 82).
- **Commercial/Industrial Land** Commercial/industrial lands are highly developed areas, including power or utility stations, manufacturing or industrial plants, commercial or retail facilities, roads, military restricted areas, and oil and gas developments. Impervious surfaces account for 80 to 100 percent of the total cover of commercial/industrial lands (NLCD code 24).
- **Forest** Forested lands include tracts of upland or wetland deciduous, evergreen, or mixed forest, dominated by trees generally greater than 16.4 feet (5 meters) tall, and greater than 20 percent of total vegetation cover. Additional details concerning specific vegetation types in the Project area, including forest lands and their locations, are provided in draft Resource Report No. 3 (NLCD codes 41, 42, and 43).
- **Open Land** Open land includes non-forested areas of barren land and areas of dwarf scrub/shrub, grasslands, sedges, emergent herbaceous wetlands, woody wetlands, lichens, and/or mosses (NLCD codes 31, 51, 52, 71, 72, 73, 74, 90, and 95). Additional details concerning wetland vegetation and potential impacts are provided in draft Resource Report No. 2.
- **Open Water** Open water consists of areas with less than 25 percent cover of vegetation or soil, and areas characterized by a perennial cover of ice and/or snow, generally greater than 25 percent of total cover (NLCD codes 11 and 12). Additional details concerning waterbodies and potential impacts are provided in draft Resource Report No. 2.
- **Residential Land** Residential land includes yards in residential subdivisions and single family housing units (including large-lot single-family housing units), and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes (NLCD codes 21, 22, and 23).

8.2.2 Existing Land Use in the Alaska LNG Project Area

Existing land use in the Project area is predominantly forested and open land (88 percent). Residential and commercial lands account for less than 5 percent of the total Project area. Land use in the vicinity of the Project facilities is summarized in Table 8.2.2-1 and shown on the Land Use maps provided in Appendix A.

TABLE 8.2.2-1						
Summary of Land Use Present within the Alaska LNG Project Area						
Land Use						
Cacility Name Agriculture Commercial/ Industrial Forest Open Open Land Water Residential						

TABLE 8.2.2-1						
Summary of Land Use	se Present within the Alaska LNG Project Area					
Facility Name	Agriculture	Commercial/ Industrial	Forest	Open Land	Open Water	Residential
LIQUEFACTION FACILITY						
LNG Plant	Х	Х	Х	Х	Х	Х
Marine Terminal	N/A	N/A	N/A			
PIPELINES						
Mainline	Х	Х	Х	Х	Х	х
PBTL		Х		Х		
PTTL		Х		Х		
PIPELINE ABOVEGROUND FACILITIES						
Compressor Stations			To Be De	termined		
Heater Stations			To Be De	termined		
Liquefaction Facility Meter Station			To Be De	termined		
Mainline Meter Station			To Be De	termined		
PBU Meter Station			To Be De	termined		
PTU Meter Station			To Be De	termined		
MLBVs (not on Compressor sites)			To Be De	termined		
PIPELINE ASSOCIATED INFRASTRUCTURE						
Access roads			To Be De	termined		
ATWS			To Be De	termined		
Contractor yards			To Be De	termined		
Pipe yards			To Be De	termined		
Construction camps			To Be De	termined		
Disposal sites			To Be De	termined		
Material sites			To Be De	termined		
GTP						
GTP		Х		Х	Х	
ASSOCIATED GTP INFRASTRUCTURE		·				
Offshore of West Dock			To Be De	termined		
Module Staging Area	To Be Determined					
Access Roads	To Be Determined					
Construction Camp	To Be Determined					
Material Sites	To Be Determined					
Water Reservoir, Pump Facilities, Transfer Line	To Be Determined					
Footnotes: ATWS = additional temporary workspace, MLBV = mainline block valve Source: National Land Cover Database, 2001						

8.2.2.1 Liquefaction Facility

The proposed location of the Liquefaction Facility is on the eastern shore of Cook Inlet in the Nikiski area of the Kenai Peninsula and collocated with the following:

- Access to the Kenai Spur Highway;
- Deep-water shipping channels;
- Existing industrial facilities; and
- Existing oil and gas business infrastructure.

Maps depicting land use in the vicinity of the Liquefaction Facility are provided in Appendix A. Land use within the vicinity of the Liquefaction Facility was calculated based on an approximate 1,500 acre site footprint and includes:

- Agricultural Land (<1 percent);
- Commercial/Industrial Land (5 percent);

:

- Forest Land (55 percent);
- Open Land (18 percent)
- Open Water (<1 percent); and
- Residential Land (22 percent).

The Liquefaction Facility site comprises a mixture of commercial, Kenai Peninsula Borough, State of Alaska, and private land holdings. The Marine Terminal portion of the Liquefaction Facility is located on State of Alaska land within the Cook Inlet.

Ancillary Facilities

Details concerning land use in the vicinity of the access roads, construction work camps, staging areas, and other ancillary facilities will be provided in a subsequent draft of this Resource Report.

8.2.2.2 Interdependent Facilities

Pipelines and Related Aboveground Facilities

Land use was classified within a 2,000-foot corridor along the route of the Mainline and the general area of the PTTL. Once the PBTL is defined in Pre-FEED, the land use crossed by that pipeline will be provided in a subsequent draft of this Resource Report.

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Mainline

From the GTP, the Mainline corridor follows the Dalton Highway and the TAPS corridor south to Livengood. At that point, the Mainline corridor heads south-southwest to the vicinity of Trapper Creek. From there, the pipeline corridor follows the Parks Highway (Alaska Highway 3) south-southwest to the Deshka River crossing. It then turns in a south-southwesterly direction on the west side of the Susitna River and crosses the Beluga highway near Viapan Lake. The corridor next heads in a south-southwesterly direction to the west shore of Cook Inlet in the vicinity of Shorty Creek. From there it heads south crossing Cook Inlet to Boulder Point on Kenai Peninsula. The corridor for the Mainline crosses Kenai Peninsula in a southerly direction to the Liquefaction Facility on the eastern shore of Cook Inlet in the Nikiski area. In all, the Mainline corridor will cross the Yukon, Tanana, Deshka, Yentna, Ivan, Lewis, Theodor, and Beluga Rivers among others.

Mapping depicting land use in the vicinity of the approximate 800-mile Mainline corridor is provided in Appendix A. Land use within the vicinity of the Mainline is predominantly forest and open land, including the following:

- Agricultural Land (1 percent);
- Commercial/Industrial Land (<0.1 percent);
- Forest (47 percent);
- Open Land (41 percent);
- Open Water (7 percent); and
- Residential Land (4 percent).

The Mainline will be sited on more than 85 percent Federal, State of Alaska, or Borough land of various holdings, with the remainder on privately owned land.

<u>PTTL</u>

According to the current design, the PTTL will be an approximately 60-mile pipeline to transport natural gas from the PTU to the GTP. The PTTL will be located entirely within the NSB and cross public lands managed by the State of Alaska. The PTTL will head east from the GTP, crossing the Putuligayuk, Sagavanirktok, Kadleroshilik, and Shaviovik Rivers before following east along the south side of the existing Badami pipeline, all the way to the PTU. The route is intended to avoid multiple crossings of existing oil pipelines. Pre-FEED studies will determine whether the PTTL should be an elevated or buried pipeline. Mapping depicting land use in the vicinity of the PTTL is provided in Appendix A. Land use within the vicinity of the PTTL is predominantly open land, including as follows:

- Commercial/Industrial Land (1 percent);
- Open Land (93 percent); and
- Open Water (6 percent).

Aboveground and Ancillary Facilities

Details concerning land use in the vicinity of the aboveground facilities (e.g., compressor stations and heater stations) and ancillary facilities (e.g., construction work camps, staging areas) will be provided in a subsequent draft of this Resource Report as the Pre-FEED phase progresses.

GTP

The location of the GTP (including the PBTL) is on the North Slope near the Beaufort Sea coast. The GTP will be located within Prudhoe Bay, an area occupied by oil and gas production facilities and operations. Maps depicting land use in the vicinity of the GTP are provided in Appendix A. Land use within the vicinity of the proposed location is predominantly open land, including:

- Commercial/Industrial (2 percent);
- Open Land (92 percent); and
- Open Water (6 percent).

The GTP will be located entirely on State of Alaska land.

8.2.3 Land Requirements

The Project's current design includes approximately 30,000 acres of land that will be temporarily affected by Project construction. Following completion of construction, approximately 15,000 of these acres will be permanently converted for Project facilities operation. Table 8.2.3-1 illustrates how the acreage affected during construction and operation of the Project facilities will be presented in a subsequent draft of this Resource Report, once further details are known.

Alaska contains over 663,000 square miles of land. Anticipated land use required during Project operations will be less than 0.1 percent of the state's total available land area. Project siting has endeavored to collocate the proposed facilities adjacent to existing infrastructure to the extent practicable, minimizing the amount of permanent changes which will occur to land. General information concerning land use for the Project facilities is provided below.

	TABLE 8.2.3-1	
Summary of Land Required for	r Construction and Operation of the Alas	ka LNG Project.
Facility Name	Land Affected During Construction (acres)	Land Affected During Operation (acres)
LIQUEFACTION FACILITY		
LNG Plant		
Marine Terminal		
PIPELINES		
Mainline		
PBTL		
PTTL		
PIPELINE ABOVEGROUND FACILITIES		
Compressor Stations		

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	TABLE 8.2.3-1	
Summary of Land Required fo	r Construction and Operation of the Alas	ska LNG Project.
Facility Name	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Heater Stations		
Liquefaction Facility Meter Station		
PBU Meter Station		
PTU Meter Station		
Mainline Meter Station		
MLBVs (not on Compressor sites)		
PIPELINE ASSOCIATED INFRASTRUCTURE		
Access roads		
ATWS		
Contractor yards		
Pipe yards		
Construction camps		
Disposal sites		
Material sites		
GTP		
GTP		
ASSOCIATED GTP INFRASTRUCTURE		
Offshore West Dock		
Module Staging Area		
Access Roads		
Construction Camp		
Material Sites		
Water Reservoir, Pump Facilities, Transfer Line		
TOTAL FOOTPRINT		

8.2.3.1 Liquefaction Facility

Based on the Project's current design, it is anticipated that approximately 400 - 800 acres will be impacted during construction of the Liquefaction Facility. This includes land required for the permanent:

- LNG Plant; and
- Marine Terminal.

Ancillary Facilities

Anticipated land requirements for support areas include the following:

- Marine Construction Dock (MCD);
- Material Offloading Facility (MOF);
- Aggregate Dock (AD);

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- Temporary infrastructure and storage yards (e.g., concrete batch plant, laydown areas);
- Contractor yards;

Construction camp;

- Material sites; and
- Disposal areas (to be further defined in subsequent versions of this Resource Report).

All but the MOF will be temporary and discontinued following completion of construction.

8.2.3.2 Interdependent Facilities

Pipelines and Related Aboveground Facilities

The Project is currently evaluating construction and operation ROW widths for all pipelines. In general, the construction ROW width will vary depending on conditions along the pipeline route and the construction season. Other factors influencing the construction workspace requirements include proximity to permanent access roads, cross and longitudinal slopes, bedrock, soils, ice, wetlands, and construction traffic volume on the ROW.

Aboveground and Ancillary Facilities

The Project's current design anticipates construction of typical compressor stations, including temporary construction camp and laydown areas. Each compressor station will require approximately 25 acres of land for construction. Heater stations are anticipated to require clearing an area of up to 15 acres of land for construction, including temporary construction camp and laydown areas.

Meter stations, MLBVs, launchers and receivers, off-take interconnection points, cathodic protection facilities, aboveground pipeline support structures, will be within the footprint or ROW of the facilities (e.g., Liquefaction Facility, Mainline, GTP, PTTL, and PBTL) such that no additional land requirements will be necessary beyond that already associated with the facilities. However, the engineering team is currently evaluating the potential need for additional land on a facility-specific basis as the project progresses toward Pre-FEED.

Access Roads

Existing access roads will be used to the extent practicable. North of Livengood, construction crews and operations staff will utilize the gravel and access roads that were built for TAPS and for the Denali highway, where appropriate. Additional access roads or upgrades may also be required north of Livengood.

South of Livengood, the current design considers access approximately every five to ten miles of pipeline from the nearest existing public or private road to the construction ROW.

Helipads

Each helipad will be constructed with dimensions of approximately 100 feet by 100 feet. The affected land most likely will be within the construction camp site and/or the permanent operations ROW of the pipeline or a compressor station. In that case, no additional land use will be necessary beyond that already associated with these facilities.

Airstrips

The potential need to upgrade any existing public airports and private airfields for the Project is under evaluation.

Temporary Support Areas

Anticipated land requirements for temporary support areas include:

- Construction camps (10–40 acres);
- Pipe storage yards (20–25 acres);
- Contractor yards;
- Temporary docks; and
- Material sites.

In some cases, these areas may be collocated together, depending on available acreage, access, and topography. To the extent possible, these sites will be located on previously disturbed areas.

GTP

Based on the Project's current design, it is anticipated that approximately 500 to 1,000 acres will be used during construction of the GTP and all ancillary and interdependent facilities. Of the 500 to 1,000 acres, the land associated with the GTP operation is anticipated to decrease to approximately 200 to 300 acres.

Ancillary Facilities

Offshore West Dock

Based on the Project's current design, it is anticipated that modifications to the West Dock's Dock Head (DH) 2 facilities will require gravel fill to increase the dock head by approximately 25 acres. The existing channel from Dock Head (DH) 2 will need to be widened and deepened (out to the 16-foot-depth contour) to accommodate the larger vessels for module offloading.

Water Reservoir

Based on the Project's current design, it is anticipated that a water reservoir will be required for the supply of firewater, potable water, and process makeup water. The water reservoir is anticipated to be constructed on the north side of the Putuligayuk River.

Access Roads

Based on the Project's current design, it is anticipated that approximately 100 to 150 acres of land will be required during construction and operation of access roads associated with the GTP. This includes two to five acres to widen the existing causeway road from the West Dock's Dock Head (DH) 2, 15 to 20 acres to widen an existing road in the PBU, and approximately 100 acres to construct new north and south roads.

Temporary Support Areas

Anticipated land requirements for temporary support areas include:

- Module staging area (20–40 acres);
- Construction camp; and
- Material sites, from existing sites or the water reservoir location.

8.3 **RESIDENTIAL AND COMMERCIAL AREAS**

8.3.1 Residential Areas

Based on the Project's current design, less than 5 percent of the Project area is occupied by residential development. As facility sites and pipeline corridors are refined during the Pre-FEED process, all residences and buildings that would be within 50 feet of the construction ROW will be located and identified. Table 8.3.1-1 demonstrates how information concerning residences and buildings within 50 feet of the Project construction area will be presented in a subsequent draft of this Resource Report once further details are known on the siting of the Project.

	TABLE 8.3.1-1							
Resi	Residences and Buildings Within 50 Feet of the Construction Work Area							
Segment/Borough or Census Area	Project Facility	Residence/ Building	Occupancy	Milepost	Distance from Centerline (feet)	Direction from Centerline		

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8.3.2 Commercial Areas

Based on the Project's current design, less than 1 percent of the Project area is commercially developed. As facility sites and corridors are refined during the Pre-FEED process, all commercial areas that would be within 50 feet of the construction ROW or ATWS will be located and identified. Table 8.3.2-1 demonstrates how information concerning commercial areas within 50 feet of the Project construction area will be presented in a subsequent draft of this Resource Report, once further details are known.

	TABLE 8.3.2-1						
	Commercial Areas Within 50 Feet of the Construction Work Area						
Segment/Borough or Census Area	Project Facility	Commercial/Industrial Structure	Milepost	Distance and Direction from Construction Work Area (feet)	Distance from Permanent Footprint (feet)		

8.3.3 Planned Residential and Commercial Areas

The southern portion of the Project area has the highest concentration of residential and commercial development. As facility sites and corridors are refined during the Pre-FEED process, details concerning identified planned residential and commercial areas that would be within 0.25-mile of the proposed Project facilities will be identified by milepost and provided in a subsequent draft of this Resource Report.

8.3.4 Summary of Residential and Commercial Areas in the Project Area

8.3.4.1 Liquefaction Facility

The Liquefaction Facility will be located near existing industrial facilities and oil and gas infrastructure. The actual footprint of the Liquefaction Facility, including ancillary facilities, will be identified during the Pre-FEED process. Details pertaining to residences and commercial developments potentially affected during construction and operation will be presented in a subsequent draft of this Resource Report once further details are known.

8.3.4.2 Interdependent Facilities

Pipelines and Related Aboveground Facilities

Mainline

Along the Mainline corridor, the southern portion of the Project area has the highest concentration of commercial development. Details pertaining to residences and commercial developments potentially affected during construction and operation of the Mainline will be presented in a subsequent draft of this Resource Report once further details are known.

<u>PBTL</u>

The actual footprint of the PBTL will be identified during further stages of the Pre-FEED process. As facility sites are refined, residences and commercial developments potentially affected during construction and operation as well as roads used to access the area will be identified and presented in a subsequent draft of this Resource Report.

PTTL

The Project is currently evaluating construction and operation ROW widths for the PTTL. As the PTTL construction workspace requirements are defined, residences and commercial developments potentially affected during construction and operation as well as roads used to access the area will be identified and presented in a subsequent draft of this Resource Report. However, at this time, there do not appear to be any residences in close proximity to the PTTL.

Aboveground and Ancillary Facilities

The locations of the aboveground (e.g., compressor stations, heater stations, meter stations, MLBVs) and ancillary facilities (e.g., construction camps, access roads, contractor yards) are not known at this time. As facility sites are refined in the Pre-FEED process, details pertaining to residences and commercial developments potentially affected during construction and operation will be presented in a subsequent draft of this Resource Report once further details are known.

GTP

The GTP will be located within Prudhoe Bay, an area occupied by oil and gas production facilities and operations. The actual footprint of the GTP, including ancillary facilities, will be identified during the Pre-FEED process. There are no residences and commercial developments in this area.

8.4 ZONING

Zoning Maps and other zoning information were reviewed to determine existing zoning designations applicable to the Project area including the following:

- Kenai Peninsula Borough (KPB);
- North Slope Borough (NSB);
- Yukon-Koyukuk Census Area;
- Fairbanks North Star Borough (FNSB);
- Denali Borough (DB); and
- Matanuska-Susitna Borough.

8.4.1 Liquefaction Facilities

The Liquefaction Facility will be located in the KPB, but not within established local option zoning districts or any incorporated cities. However, the KPB regulates developments within floodplains and near anadromous fish streams.

8.4.2 Interdependent Facilities

8.4.2.1 Pipelines and Related Aboveground Facilities

<u>Mainline</u>

Zoning information along the Mainline, from north to south, includes regulations from the boroughs listed below. Applicable zoning information for the Mainline will be further refined in a subsequent draft of this Resource Report.

North Slope Borough (NSB)

The northern portion of the Mainline is zoned by NSB as the Resource Development District (see below for GTP), while the majority of the ROW within the NSB is zoned as the Transportation Corridor District. According to the North Slope Borough Code (NSB Code) (19.40.090), the Transportation Corridor District was established to provide a strip of land to accommodate linear transportation facilities (e.g., roads and pipelines). A development permit is required for development of new transportation facilities, including gas lines, oil lines, associated roads, pump stations, pipeline maintenance facilities, resource extraction, and other necessary supporting developments within the Transportation Corridor District.

Yukon-Koyukuk Census Area

At this time, there is no zoning within the Project area. The Yukon-Koyukuk Census Area is part of the Unorganized Borough, comprising the lands of Alaska not within the boundaries of the state's organized boroughs. Zoning within the Unorganized Borough is overseen by the state legislature (Alaska Constitution, Article X, Sections 3 and 6, and AS 29.03.010).

Fairbanks North Star Borough

The Fairbanks North Star Borough (FNSB), as a second class borough, provides for planning, platting, zoning, and land use regulations on an area-wide basis (both inside and outside of cities) within the Borough in accordance with Alaska Statute 29.40. The Borough's Planning Commission was established by Chapter 2.40 of the Borough's Code of Ordinances. The Planning Commission is charged with preparing and recommending to the legislative assembly appropriate policies, plans, and ordinances for the implementation of the municipal planning, official map, comprehensive plan and zoning functions; acting as an appeals body of decisions of the Platting Board; and acting upon requests for exceptions to the FNSB Land Use Code (Title 18). The Borough requires that an approved zoning permit be acquired prior to excavation, construction, relocation, or installation for a new land use. Pursuant to the FNSB Title 18 Zoning Code, the installation and maintenance of utility lines are permitted uses in all zoning districts.

Denali Borough (DB)

According to the DB Comprehensive Plan, land in DB is zoned unrestricted unless otherwise provided for by ordinance (DB, 2009). No prohibitions exist on land zoned unrestricted [Ordinance 96-04 § 2].

Matanuska-Susitna Borough

The Matanuska-Susitna Borough has zoning, land use, and building regulations. Land development in the borough is subject to Matanuska-Susitna Borough Section 17.02, Mandatory Land Use Permit. The Matanuska-Susitna Borough has platting authority and a Code Compliance Division. The State Fire Marshal is the State Building Official. While the Matanuska-Susitna Borough does not have a borough-wide zoning code, it regulates land use through special land use districts, residential land use districts, and other mechanisms (STB, 2010).

Kenai Peninsula Borough (KPB)

The KPB has several established local option zoning districts for residential areas. The incorporated cities within the KPB exercise zoning provisions within their jurisdictions. The KPB also implements regulations for developments within floodplains and streams supporting anadromous fish.

Cities and Communities

Cities or communities that have zoning authority would not be intersected by the Project footprint.

<u>PBTL</u>

The PBTL is located entirely within the North Slope Borough and will cross lands within the PBU which are zoned for resource development.

<u>PTTL</u>

The PTTL will be located entirely within the North Slope Borough and will cross public lands managed by the State of Alaska. The lands are zoned by the NSB as Resource Development as discussed above.

Aboveground and Ancillary Facilities

The locations of the aboveground (e.g., compressor stations, heater stations, meter stations, MLBVs) and ancillary facilities (i.e., construction camps, access roads, contractor yards) are not known at this time. As facility locations are refined in the Pre-FEED process, zoning designations will be determined and presented in a subsequent draft of this Resource Report.

8.4.2.2 GTP

The northern portion of the Project area, including the GTP, is zoned by the NSB as Resource Development. The Resource Development District, according to NSB code (19.40.080), is intended to address the cumulative impacts of large-scale development, and to offer developers prompt, cost-effective, and predictable permit approvals. The purpose of the Resource Development District is to accommodate large-scale resource extraction and related activities that include the following features:

- Do not permanently and seriously impair the capacity of the surrounding ecosystem to support the plants and animals upon which Borough residents depend for subsistence;
- Are planned, phased, and developed as a unit, or series of interrelated units under an approved Master Plan, with provisions made for necessary public and private facilities; and
- Meet Title 19 Borough Policies, as well as the conditions of approval and special policies imposed on each individual Resource Development District at the time of designation (NSB Code 19.40.080).

8.5 LANDOWNERSHIP AND SPECIAL MANAGEMENT AREAS

Landownership and special management areas were identified for the Liquefaction Facility and Interdependent Facilities, which included a 2,000-foot wide corridor and the GTP. The actual footprint of the Project facilities, including ancillary facilities, will be further identified during the Pre-FEED process (See Appendix A for Project maps depicting land ownership). Table 8.5-1 demonstrates how information concerning landownership will be presented in a subsequent draft of this Resource Report once further details are known.

TABLE 8.5-1					
	Summary of	Landownership/	Management		
Segment/Agency or Entity	Project Facility	Begin Milepost	End Milepost	Approximate Crossing Length (miles)	Percent of Total Project Length
Federal Land					
BLM					
USFWS					
State Land					
State of Alaska					
ADOT&PF					
Municipal Land					
Kenai Peninsula Borough					
Fairbanks North Star Borough					
Private Land					
Native Corporation Land					
PROJECT TOTAL					

8.5.1 Federally Owned and Managed Land

The Project area will intersect federal lands owned and managed by the BLM and USFWS, as discussed below in Table 8.5-1. A depiction of the lands potentially crossed by the proposed study corridor is provided in Appendix A. Figure 8.5-1 depicts the conservation designated lands crossed. Although the

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study corridor will occur on NPS land, the actual construction and operation of the Project will not occur on NPS land.

8.5.1.1 Bureau of Land Management

The BLM administers most of the federal lands within the Project area. Under the Federal Land Policy and Management Act (FLPMA) of 1976 (43 U.S.C. § 1761 et seq.), the BLM manages approximately 75 million surface acres of federal public land within Alaska through its Fairbanks and Anchorage District offices. Section 503 of the FLPMA provides for the designation of ROW corridors and encourages utilization of ROW assemblages to minimize environmental impacts and the proliferation of separate ROWs. In designating ROW corridors under Section 503, BLM considers national and state land use policies, environmental quality, economic efficiency, national security, and good engineering and technological practices. Pursuant to the Mineral Leasing Act (MLA) (30 U.S.C. § 185) and 43 C.F.R. 2881.11, an applicant must have a BLM grant under the MLA for an oil or gas pipeline, or related facility, to cross federal lands either under BLM's jurisdiction or the jurisdiction of two or more federal agencies. If the application involves two or more federal agencies, the BLM will not issue or renew a grant until the heads of the agencies administering the lands involved have concurred (CFR, 2012).

Central Yukon and Utility Corridor Planning Area

As prescribed by FLPMA, land use plans will be developed for public land "to establish public land policy; to establish guidelines for its administration; to provide for the management, protection, development, and enhancement of the public lands; and for other purposes" (BLM, 2001). The Project will encompass an area subject to the BLM's Utility Corridor Resource Management Plan (RMP)/Environmental Impact Statement (EIS) from 1991. As taken from the RMP's Record of Decision, the Utility Corridor RMP is a comprehensive land use plan developed to direct the BLM's management of a portion of the lands and minerals it administers in northern Alaska (BLM, 1991a). The Utility Corridor RMP, established by Public Land Order 5150, is an essential component of the national oil and gas transportation system. In recognition of this fact, the RMP provides that the primary management direction and use of BLM-administered lands in the Utility Corridor is for energy transportation.

It should be noted that the BLM published a Notice of Intent in the Federal Register on June 14, 2013 announcing the beginning of a scoping process to prepare a RMP with an associated EIS for the Central Yukon Planning Area. The BLM has determined that revisions are needed to the existing Utility Corridor RMP (BLM, 1991b), Central Yukon RMP (BLM, 1986a), and Southwest Management Framework Plan (1986, as cited in BLM, 2015). The revised Central Yukon RMP will replace both the Utility Corridor and Central Yukon RMPs in their entirety and a small part of the Southwest Management Framework Plan. While a draft of the RMP/EIS will not be available for public review until 2015, key issues to be addressed by the RMP include the following:




- Management of land use and activities for recreational uses, vehicle access, minerals management, landownership and assemblages, and easement access;
- Conservation of lands having special, critical, or unique features or resource values: Areas of Critical Environmental Concern (ACECs), Research Natural Areas (RNAs), Wild and Scenic Rivers (WSRs), Wilderness Study Areas, and the Iditarod National Historic Trail; and
- Management of Natural Resources: impacts to soil, air, and water; hazardous and solid waste; vegetation and forest products; special-status species (Endangered Species Act).

Three federally-designated corridors within the Utility Corridor's planning area accommodate ROW:

- Alaska Utility Corridor A 6 to 24-mile wide corridor that runs north-south through most of the planning area and consists of an inner and outer corridor, which is further described below;
- Section 201(4)(b) of the ANILCA (Alaska National Interest Lands Conservation Act, PL 96-487, 1980) Corridor – Provides surface access for transportation purposes across public lands from the Ambler Mining District to the Dalton Highway; and
- Section 1431(j) of the ANILCA Corridor A 6 to 12-milewide corridor authorized by ANILCA across the Central Arctic Management Area (CAMA) to provide the Arctic Slope Regional Corporation (ASRC) an oil and gas pipeline ROW, including related facilities, across public lands from the Kurupa Lake and Killik River areas east to the TAPS corridor.

The Alaska Utility Corridor is comprised of an inner and an outer corridor. The majority of the Mainline and associated infrastructure will be located within the inner utility corridor. Various non-energy transportation activities are restricted within the inner corridor (e.g., mineral resource development) and, with a few exceptions (e.g., ACEC), the area is devoted to the transportation of energy resources. It should be noted that the inner corridor generally corresponds to the Dalton Highway Recreation Management Area (RMA), which includes lands within the corridor adjacent to existing roadways, and the Dalton Corridor RMA, which includes the remainder of the utility corridor (BLM, 1991c).

Eastern Interior Planning Area

The BLM is currently preparing a RMP for the Eastern Interior Planning Area. The RMP will establish goals and objectives for managing resources, and will outline the measures needed to achieve those goals and objectives. The Project area will pass through the Eastern Interior Planning Area, which encompasses the Yukon Flats National Wildlife Refuge (NWR) and the White Mountains National Recreation Area (NRA). The Project area will occur outside Yukon Flats NWR and the White Mountains NRA.

East Alaska Planning Area

The East Alaska Planning Area includes 6.8 million acres of BLM-administered public land in eastern Alaska and the Bering Glacier. The Project area is located in the western portion of the East Alaska planning area, where no strict special management areas are present.

Ring of Fire Planning Area

The Ring of Fire RMP was approved in July 2006 and spans a distance of 2,500 miles. The Project area is located within the Southcentral Region of the Ring of Fire planning area which continues south to Anchorage and the surrounding area.

Special Designation Areas

Special designation areas are lands that are managed by federal agencies for the protection or enhancement of specific resource values (e.g., cultural, special-status species, visual, and/or wilderness). Lands categorized as special designation areas include ACECs, Extended Recreation Management Areas (ERMAs), Special Management Areas (SMAs), Special Recreation Management Areas (SRMAs), Wilderness Study Areas, WSRs, National Parks, and National Recreation Areas.

Areas of Critical Environmental Concern (ACECs)

Some areas under BLM management have been designated as ACECs. ACECs are areas within public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards (43 C.F.R. § 1601.0-5). Generally, development activities and future energy transportation systems are allowed.

No ACECs will be intersected by the Liquefaction Facility, GTP, or PTTL. The Mainline corridor will cross four ACECs. Those areas include the Sagwon Bluffs ACEC, Toolik Lake RNA ACEC, Galbraith Lake Outstanding Natural Area (ONA) ACEC, and Sukakpak Mountain ACEC.

Sagwon Bluffs ACEC

Sagwon Bluffs was designated as an ACEC to protect threatened raptor habitat: peregrine, gyrfalcon, and rough-legged hawk. Approximately 20 percent of the known nesting pairs of arctic peregrine falcons occur along the Sagavanirktok River. Protection of hunting habitat in this ACEC provides additional safeguards for the peregrine falcon. The ACEC also protects riparian habitat for caribou, moose, and grizzly bear; has the most northerly known Athabaskan archeological sites; and provides habitat to a sensitive plant species (*Erigeron muirii*).

Toolik Lake Research Natural Area

The Toolik Lake RNA ACEC has been designated to protect a natural land and tundra biome used for Arctic natural resources research, primarily associated with the Toolik Field Station through the University of Alaska Fairbanks. Although the BLM's RMP/EIS (1991b) acknowledges that energy transportation is the primary function of the utility corridor across this ACEC, protection of the area is to occur to the extent practical to protect data and research projects.

Galbraith Lake Outstanding Natural Area

The Galbraith Lake ONA ACEC is the largest of the five ACECs within the Central Yukon Field Office region. It encompasses the Atigun River Valley and portions of the mountains on both sides of the valley. The Galbraith Lake ONA ACEC also includes Galbraith Lake and several drainages that feed the lake.

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The area is managed to protect historical and archaeological sites, critical wildlife habitat, paleontological and geological sites, scenic values, and any rare and sensitive plants that may be present.

Sukakpak Mountain ACEC

The Sukakpak Mountain ACEC has been designated to protect unique geologic structures, folds, and faults, as well as views of the geologic process of mountain building and erosional forces. Rare plant species are also present and the area is accessible to the public via the Dalton Highway. The area is an available source of mineral materials with access via a material source access road. However, material sales on the mountain's slopes are now discouraged to ensure the scenic qualities of the area (BLM, 1991c).

Wilderness Areas

The Wilderness Act of 1964 (16 USC Chapter 23 §§ 1131-1136, 78 Stat. 890, Public Law 88-57) established the National Wilderness Preservation System and designated the first Wilderness Areas. Seven Wilderness Areas were designated in Alaska by the Alaska National Interest Lands Conservation Act (ANILCA, 16 U.S.C. Chapter 51 §§ 3101-3233, Public Law 96-487, December 2, 1980). The Project area would not affect designated Wilderness Areas in Alaska.

Iditarod National Historic Trail

BLM coordinates cooperative management of The Iditarod National Historic Trail and is the primary point of contact for matters involving the entire Trail. The Iditarod National Historic Trail: Seward to Nome Route—A Comprehensive Management Plan was published in 1986 by the BLM. This plan outlines the Trail network and impacted communities, but does not provide guidance related to utility corridors. The Mainline corridor does cross the Iditarod National Historic Trail at two locations, which appear to be two different Iditarod trail alignments. This Trail is further discussed in Section 8.6.2.

Dalton Highway

The Dalton Highway Recreation Management Plan addresses approximately 1.1 million acres of public land within the Utility Corridor. It does not cover all Utility Corridor lands and only covers those lands within close proximity to existing roads. The plan was developed so that BLM could identify appropriate management objectives, policies, actions, future staffing, and funding requirements to accommodate current and future recreation demands, ensure visitor safety, manage the resources, and protect the integrity of the energy transportation corridor (BLM, 1991c).

The Dalton Highway is further discussion in Section 8.6.5. The Mainline corridor includes lands covered by the Dalton Highway Recreation Management Plan.

8.5.1.2 National Park Service

No NPS-administered lands will be intersected by the Project. The Mainline corridor will pass within the vicinity of the Gates of the Arctic National Park and Preserve (NPP) and Denali NPP. The Mainline corridor will pass through the Brooks Range outside the eastern boundary of the Gates of the Arctic NPP. The Mainline corridor is located adjacent to and will slightly include the eastern boundary of Denali NPP.

However, as the Mainline route is further refined, it is expected that the Mainline will avoid the Denali NPP. Additional details concerning the Denali NPP are provided in Section 8.6.4.

In 1980, Congress passed the Alaska National Interest Lands Conservation Act (ANILCA, Public Law 96-487, 16 U.S.C. §§ 3101-3233,). Section 101 of the ANILCA describes the broad purposes of the new conservation system units (CSUs) throughout Alaska, including the Gates of the Arctic NPP and Denali NPP (NPS, 2006). The purpose of the ANILCA CSUs includes the following:

- Preserve lands and waters for the benefit, use, education, and inspiration of present and future generations;
- Preserve unrivaled scenic and geological values associated with natural landscapes;
- Maintain sound populations of, and habitat for, wildlife species;
- Preserve extensive, unaltered ecosystems in their natural state;
- Protect resources related to subsistence needs;
- Protect historic and archeological sites;
- Preserve wilderness resource values and related recreational opportunities such as hiking, canoeing, fishing, and sport hunting;
- Maintain opportunities for scientific research in undisturbed ecosystems; and
- Provide the opportunity for rural residents engaged in a subsistence way of life to continue to do so.

Section 202 of the ANILCA states that additions to the Denali National Park and Preserve (NPP) are to be managed for the following additional specific purposes:

- Protect and interpret the entire mountain massif and the additional scenic mountain peaks and formations;
- Protect habitat for and populations of fish and wildlife, including, but not limited to, brown/grizzly bears, moose, caribou, Dall sheep, wolves, swans, and other waterfowl; and
- Provide continued opportunities, including reasonable access, for mountain climbing, mountaineering, and other wilderness recreational activities.

ANILCA Title XI establishes a comprehensive system for the approval or disapproval of transportation and utility systems within the conservation system units (CSUs) established or expanded by the Act. Title XI sets forth criteria for considering the applications, including an assessment of the impacts on fish and wildlife and their habitat (USC Chapter 51 §§ 3161-3173). Transportation systems that are proposed to cross a CSU created or expanded by ANILCA require an act of Congress if such transportation systems would cross any Congressionally designated wilderness area, or if no authority exists for granting a ROW

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for the particular type of transportation system proposed, such as a natural gas pipeline across NPS units in Alaska. In the Denali National Park Improvement Act, Public Law 113-33 (2013), Congress authorized potential issuance of a permit, subject to environmental conditions and in accordance with the ANILCA Title XI process for non-wilderness areas, for a high-pressure natural gas transmission pipeline along the approximately 7-mile segment of the George Parks Highway that runs through the Park. The Project examined this option, designed for a smaller diameter pipeline of lower pressure, and determined that this routing was technically infeasible for a large diameter high pressure pipeline system. Additional detail on the analysis of this alternative will be provided in a subsequent draft of Resource Report no. 10.

The requirements of ANILCA Title XI are only triggered if a project intersects Denali NPP and the NPS must issue a permit for use of the ROW. Although the proposed Mainline corridor shows overlap with the Denali NPP, the Project does not intend to cross or impact the NPP with the final route.

Section 6(f) of the Land and Water Conservation Fund

Section 6(f) of the Land and Water Conservation Fund (LWCF; 16 USC 4601 et seq.) applies to public areas that have received LWCF funding to acquire or develop public recreational facilities. Section 6(f) (3) requires these areas be maintained for public outdoor recreational use, unless the NPS approves substitute land determined to be of equivalent location, suitability for recreation, and greater or equal to the fair market value of the original property. This statute would apply to lands that have received LWCF assistance. Based on geographic information system analysis, the Mainline corridor passes through Section 6(f) lands within Denali State Park.

8.5.1.3 U.S. Department of Fish and Wildlife

The 2,000-foot Mainline corridor will approach a portion of the Arctic National Wildlife Refuge (Arctic NWR), which is administered by the USFWS; however, construction and operational activities will not occur in the refuge. Arctic NWR is designated as a CSU under ANILCA (see the discussion of CSUs above for the NPS). When Arctic NWR was established in 1960, its boundaries encompassed 9 million acres. In 1980, ANILCA enlarged the boundaries to over 19 million acres, 8 million acres to be designated as Wilderness, including three WSRs. The purposes for which the Arctic NWR was established and will be managed, as set forth by ANILCA Section 303(2) (B), are identical to those set forth for the Yukon Flats NWR, except that the populations to be conserved within the Arctic NWR vary slightly (caribou herds, polar bears, grizzly bears, muskox, Dall sheep, wolves, wolverines, snow geese, peregrine falcons, other migratory birds, and Arctic char and grayling). Additional details concerning the Arctic NWR are provided in Section 8.6.4.

8.5.1.4 Summary of Applicable Federal Land Use Plans

Liquefaction Facility

The Liquefaction Facility is located within the Ring of Fire RMP area, which is under BLM federal management. An overview of the potentially applicable stipulations for the areas crossed is provided in Table 8.5.1-1.

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TABLE 8.5.1-1				
s	Summary of Applicable Federal Land Use Plans and Documents for the Liquefaction Facility			
Author/Agency	Land Use Plan/Document	Acres	Potential Applicable Stipulations	
Bureau of Land Management	Ring of Fire Resource Management Plan (RMP) (2008)	To Be Determined	According to the BLM Record of Decision issued in 2008, oil and gas pipelines and associated ROW is issued using the Mineral Leasing Act of 1920. Stipulations developed include:	
			 Reclamation, revegetation and curtailment of erosion along the ROW; 	
			Compliance with air and water quality standards;	
			 Control or prevention of damage to the environment, public and private property and hazards to public health and safety; 	
			Protection of the natural resources associated with public lands;	
			 Utilization of common ROWs with respect to engineering and technological compatibility; and 	
			• Coordination with the state and local governments, tribal entities and interested groups and individuals is to take place to the fullest extent possible.	

Interdependent Facilities

Pipelines and Related Aboveground Facilities

Mainline

The Mainline corridor passes through multiple federally managed lands. An overview of the potentially applicable stipulations for the areas crossed is provided in Table 8.5.1-2.

	TABLE 8.5.1-2			
Summary of App	plicable Federal Land U	se Plans and I	Documents for the Pipelines and Related Aboveground Facilities	
Author/Agency	Land Use Plan/Document	Mileposts	Relationship with the Proposed Action	
Bureau of Land Management	Utility Corridor RMP/Environmental Impact Statement (EIS) Record of Decision (1991)	To Be Determined	The proposed RMP/Final EIS identifies the Inner and Outer portions of the Utility Corridor within its planning area. The Project will be located within the Utility Corridor. The primary management direction and use of BLM-administered lands in the Utility Corridor is for energy transportation. In addition to the Management Practices and Allowable Uses for the Galbraith Lake, Sagwon Bluffs, Sukakpak Mountain ACECs and Toolik Lake RNA, the protection measures and stipulations are detailed in Appendices K and L of the proposed RMP/Final EIS.	
	Central Yukon Planning Area Resource Management Plan and Record of Decision (1986)	To Be Determined	The following policies would apply for access to or across BLM lands managed under the RMP: Granting access to or across public lands will be considered on a case-by-case basis. Under this RMP, the use of vehicles of greater than 1,500 pounds GVW will be allowed by authorization only. Vehicle use may be authorized under a mining plan of operations (43 C.F.R. 3809), with a permit (43 C.F.R .2800 or 43 C.F.R. 2920), or by other appropriate means. Approval will be subject to conditions that minimize the impact to other land uses and/or prevent unnecessary damage to the environment.	

TABLE 8.5.1-2			
Summary of Applicable Federal Land Use Plans and Documents for the Pipelines and Related Aboveground Facilities			
Author/Agency	Land Use Plan/Document	Mileposts	Relationship with the Proposed Action
	Central Yukon Resource Management Plan and EIS (2015)	To Be Determined	The BLM is revising the existing Utility Corridor RMP (BLM, 1991b), Central Yukon RMP (BLM, 1986a), and Southwest Management Framework Plan (1986). The revised Central Yukon RMP will replace both the Utility Corridor and Central Yukon RMPs in their entirety and a small part of the Southwest Management Framework Plan. A draft of the RMP/EIS will be available for public review in 2015.
	East Alaska RMP (2006)	To Be Determined	The required operating procedures and oil and gas leasing stipulations are described in Appendix C of the RMP/Final EIS.
	Eastern Interior Alaska RMP (2006)	To Be Determined	There is no real directive provided within the RMP. The RMP generally states that the ROW for pipelines and associated facilities should be consolidated with existing transportation corridors to help protect visual resources and impacts to wildlife.
	Ring of Fire RMP (2008)	To Be Determined	According to the BLM Record of Decision issued in 2008, oil and gas pipelines and associated ROW are issued using the Mineral Leasing Act of 1920. Stipulations developed during a proposal's evaluation include:
			 Restoration, revegetation, and curtailment of erosion along the ROW;
			Compliance with air and water quality standards;
			 Control or prevention of damage to the environment, public and private property, and hazards to public health and safety;
			 Protection of the natural resources associated with public lands;
			 Utilization of common ROWs with respect to engineering and technological compatibility will be promoted; and
			• Coordination with the state and local governments, tribal entities, and interested groups and individuals is to take place to the fullest extent possible.
	Iditarod National Historic Trail Comprehensive Management Plan (1986)	To Be Determined	The plan outlines the Trail network and impacted communities, but does not provide guidance related to utility corridors.
	Dalton Highway Recreation Area Management Plan (1991)	To Be Determined	The plan states that "the primary function of the lands within the Dalton Highway Recreation Area Management Area (DHRMA) is the transportation of energy resources; therefore, actions or activities potentially averse to existing and future energy transportation systems will be avoided. Mineral material extraction is allowed within the DHRMA for maintenance and construction of transportation systems. This planning decision may be in conflict with recreation management objectives in some areas."
National Park Service	Denali NPP Consolidated General Management Plan (2008)	To Be Determined	Transportation systems that are proposed to cross a CSU created or expanded by ANILCA require an act of Congress if such transportation system would cross any Congressionally designated wilderness area, or if no authority exists for granting a ROW for the particular type of transportation system proposed, such as a natural gas pipeline across NPS units in Alaska. The Denali National Park Improvement Act authorizes, subject to certain conditions including the ANILCA process for a non-wilderness area, location of a pipeline in the Parks Highway road corridor within the eastern boundary of the Park on NPS land.

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TABLE 8.5.1-2			
Summary of App	blicable Federal Land U	se Plans and D	Documents for the Pipelines and Related Aboveground Facilities
Author/Agency	Land Use Plan/Document	Mileposts	Relationship with the Proposed Action
US Fish & Wildlife Service	Arctic NWR Comprehensive Conservation Plan (1988)	To Be Determined	According to the original 1988 Comprehensive Conservation Plan decision, oil & gas pipelines and supporting facilities may be permitted if compatible with refuge purposes, subject to refuge special use permit conditions. Pipelines are subject to the provisions of Title XI of the Alaska Lands Act and 43 and 50 C.F.R. No pipelines or facilities associated with the Project are planned to enter the refuge. The study corridor intersects the Arctic NWR, but the Project will not cross it.

PBTL

Based on the Project's current design, federal lands will not be crossed by the PBTL.

PTTL

Based on the Project's current design, federal lands will not be crossed by the PTTL.

Aboveground and Ancillary Facilities

The locations of the aboveground (e.g., compressor stations, heater stations, meter stations, MLBVs) and ancillary facilities (i.e., construction camps, access roads, contractor yards) are not known at this time. As facility sites are refined in the Pre-FEED process, federal land crossings will be determined and presented in a subsequent draft of this Resource Report.

GTP

Based on the Project's current design, federal lands will not be affected by the GTP. The GTP will be located on state-managed lands (Appendix A). An overview of the potentially applicable stipulations for the areas crossed is provided in Table 8.5.1-3.

TABLE 8.5.1-3				
	Summary of Applicable Federal Land Use Plans and Documents for the GTP			
Author/Agency	Land Use Plan/Document	Acres	Potential Applicable Stipulations	
Bureau of Land Management	Utility Corridor RMP/EIS Record of Decision (1991)	To Be Determined	The proposed RMP/Final EIS identifies the Inner and Outer portions of the Utility Corridor within its planning area. The proposed GTP will be located within the Utility Corridor. The primary management direction and use of BLM-administered lands in the Utility Corridor is for energy transportation. Protection measures and stipulations are detailed in Appendices K and L of the proposed RMP/Final EIS.	

8.5.2 State-Owned and Managed Land

State-owned and managed lands were identified in the Project area. A summary of the state-owned and managed lands crossed will be provided in Table 8.5-1. A depiction of the lands crossed by the proposed study corridor is provided in Appendix A. Figure 8.5-1 depicts the conservation designated lands crossed.

8.5.2.1 Alaska Department of Natural Resources

Alaska Statute (AS) 38.04.065 Land Use Planning and Classification and 11 AAC 55.010-.030 require that the ADNR "shall, with local governmental and public involvement under AS 38.05.945, adopt, maintain, and, when appropriate, revise regional land use plans that provide for the use and management of State of Alaska-owned lands." The SPCO within ADNR has primary responsibility for land use planning associated with ROW leases for the Project. Currently, over a dozen areas of Alaska are covered by management plans intended to establish goals, policies, management intent, and guidelines for state lands; allocate the use of state land through plan designations; and include recommendations to retain or sell land, open or close areas to development, and establish special land use designations.

ADNR land management divisions include the Division of Mining, Land & Water; Forestry; and Parks and Outdoor Recreation. For those lands that are owned by the ADNR, but not covered by an existing resource specific land management plan, the ADNR, Division of Mining, Land & Water, in coordination with the public, identifies important land resources and how their lands could be used for the maximum public benefit. All resource and land uses, including recreation, are considered and evaluated. Whenever possible, multiple uses are allowed on these lands.

Alaska Department of Natural Resources, Division of Mining, Land & Water

Within the Division of Mining, Land & Water, land use management plans are broken down into specific area plans, management plans, and special use lands. Area plans applicable to the Project include the following:

- Kenai Area Plan;
- Susitna Area Plan;
- Southeast Susitna Area Plan;
- Susitna Matanuska Area Plan;
- Tanana Basin Area Plan;
- Yukon Tanana Area Plan; and
- Eastern Tanana Area Plan.

Management Area Plans applicable to the Project include the following (ADNR, 2013a):

• Dalton Highway Master Plan;

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- Susitna Basin Recreation Rivers Management Plan; and
- Scenic Resources along the Parks Highway.

Alaska Department of Natural Resources, Division of Forestry

The ADNR Division of Forestry manages forests for multiple uses and the sustained yield of renewable resources on 20 million acres of state land (ADNR, 2013b). Alaska state forests include Tanana Valley, Haines, and Southeast state forests. Of these, the Project area will include portions of the 1.81 million acree Tanana Valley State Forest. This forest is open to timber extraction, mining, gravel extraction, oil and gas leasing, and grazing. Timber production is the major commercial activity (ADNR, 2013c). This forest also offers many recreational opportunities, including hunting, fishing, trapping, camping, hiking, dog mushing, cross-country skiing, wildlife viewing, snow machining, gold panning, boating, and berrypicking. The Tanana Valley State Forest is managed under the Tanana Valley State Forest Management Plan.

Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation

The ADNR Division of Parks and Outdoor Recreation provide outdoor recreational opportunities, protect and interpret areas of natural and cultural significance, and support the state's tourism industry. The Alaska State Park System contains 3.2 million acres, making it the largest in the U.S. Units in the system include parks, historic parks and sites, marine parks, wilderness parks, recreation areas and sites, trails, preserves, and special management areas. The system provides over 2,500 campsites, 128 trailheads, 37 boat launches, 43 scenic overlooks, and over 340 toilets (ADNR, 2007).

Within the Project area, six Alaska State Park units are managed by the Division of Parks and Outdoor Recreation, including the following:

- James Dalton Highway Corridor;
- Denali State Park (see Section 8.6.4);
- Kroto Creek & Moose Creek State Recreation River (SRR);
- Alexander Creek SRR;
- Little Susitna SRR; and
- Capitan Cook State Recreation Area (SRA).

Alaska Department of Natural Resources, State Pipeline Coordinators Office (SPCO)

The ADNR SPCO manages pipeline ROWs and the lands encompassed by the ROW in accordance with the lease for the purposes of construction, operation, maintenance, and termination of a pipeline and all pipeline-associated actions.

Alaska Mental Health Trust Lands

Alaska Mental Health Trust Lands exist in the Project area. The Trust Land Office is a unit within the ADNR that is contracted exclusively by the Trust to manage approximately 1 million acres of land and other non-cash assets to generate income (ADNR, 2013d). Revenue-generating uses of Trust lands include land leasing and sales; real estate investment and development; commercial timber sales; mineral exploration and production; coal, oil, and gas exploration and development; sand, gravel, and rock sales; and other general land uses. Income derived from Trust lands is used to fund a comprehensive integrated mental health program for the citizens of Alaska.

8.5.2.2 University of Alaska

The University of Alaska currently owns and manages approximately 150,000 acres in Alaska. Some of this land would be crossed by the Project. University "trust lands" are managed for the use and benefit of the University and are not considered state public domain land. The university develops, leases, and sells land and resources to generate funds for its Land Grant Trust Fund (UA, 2006).

8.5.2.3 Alaska Department of Fish and Game

The ADF&G's mission statement is "to protect, maintain, and improve the fish, game, and aquatic plant resources of the State, and manage their use and development in the best interest of the economy and the well-being of the people of the State, consistent with the sustained yield principle." Pursuant to 5 AAC 95.420 and .990, activities except for lawful hunting, trapping, fishing, viewing, and photography occurring in special areas including state parks, state game refuges, and state fish and game critical habitat areas require a special area permit. In addition, the use of helicopters or motorized vehicles requires a permit.

The ADF&G manages the Minto Flats State Game Refuge, which is located adjacent to the Project Area. Minto Flats encompasses approximately 500,000 acres and is located about 35 miles west of Fairbanks between the communities of Minto and Nenana (ADF&G, 2012). Minto Flats was established by the Alaska Legislature in 1988 to ensure the protection and enhancement of habitat, the conservation of fish and wildlife, and to guarantee the continuation of hunting, fishing, trapping, and other compatible public uses within the Minto Flats area (ADF&G, 1992). According to the Minto Flats State Game Refuge Management Plan issued in 1992, utility corridors and pipelines may be sited on refuge lands if they are determined to be compatible with the purposes for which the refuge was established (ADF&G, 1992). Proposals will be evaluated for compatibility with the refuge purposes listed in legislation and reflected in the goals of the management plan.

ADF&G also manages the Susitna Flats Game Refuge (Susitna Flats), which encompasses approximately 300,800 acres (ADF&G, 1988) and is crossed by the Mainline corridor. Susitna Flats, located between Beluga River and Point MacKenzie on the western side of Cook Inlet, was established by the Alaska Legislature in 1976. It was created to ensure the protection of fish and wildlife populations, particularly waterfowl nesting, feeding, and migration; moose calving areas; spring and fall bear feeding areas; and salmon spawning and rearing habitats. It was also established for public use of fish and wildlife and their habitat, particularly waterfowl, moose, and bear hunting; viewing; photography; and general public recreation in a high-quality environment. Each year, approximately 10 percent of the waterfowl harvested in the state occurs on Susitna Flats. New utilities may be allowed to cross the refuge where no feasible off-refuge alternative exists, using existing corridors wherever possible, consistent with refuge goals and

objectives. Two major utility lines cross Susitna Flats, the Chugach Electric Association, Inc. (CEA) electric transmission line and the Enstar natural gas pipeline (ADF&G, 1988).

Alaska Department of Fish and Game, Game Management Units

The State of Alaska is divided into 26 Game Management Units (GMUs), which dictate hunting seasons and other hunting regulations, such as bag limits. The Project area is located within GMUs 26B, 25A, 25D, 24A, 20A, 20B, 20C, 20F, 16A, 16B, 15A, and 13E (ADF&G, 2014).

8.5.2.4 Alaska Railroad Corporation

The Alaska Railroad Corporation (ARR) is an independent corporation owned by the State of Alaska. The State of Alaska prohibits the ARR from selling, exchanging, or otherwise conveying a complete interest in its land. However, the ARR leases non-operating lands to sustain its transportation assets. The Project would require a permit from the ARR.

8.5.2.5 Alaska Department of Transportation and Public Facilities

The Alaska Department of Transportation and Public Facilities (ADOT&PF) designs, constructs, operates, and maintains the State's transportation infrastructure systems, buildings, and other facilities used by Alaskans and visitors. This includes more than 5,000 miles of paved and gravel highways; more than 300 aviation facilities, including 260 airports; 43 small harbors; and a ferry system covering 3,500 nautical miles and serving 33 coastal communities (ADOT&PF, 2011). Pursuant to 17 AAC 15.011, ADOT&PF has the authority to grant a permit authorizing an applicant to construct or install utility facilities within an ADOT&PF ROW on lands owned by the State of Alaska. The Project would require a permit from the ADOT&PF.

8.5.2.6 Summary of Applicable State Land Use Plans

Liquefaction Facility

The Liquefaction Facility is located on state-managed lands (Appendix A). An overview of potentially applicable stipulations for the areas crossed is provided in Table 8.5.2-1.

TABLE 8.5.2-1			
Summary of Applicable State Land Use Plans and Documents for the Liquefaction Facility			
Author/Agency	Land Use Plan/Document	Acres	Potential Applicable Stipulations
Alaska Department of Fish & Game	Game Management Unit 15A	To Be Determined	Within 15A, the Kenai Controlled Use Area encompasses the Liquefaction Facility Site. This area is closed to the use of aircraft (for hunting moose, including transportation of moose hunters) before 12:01 a.m. on September 11 th .

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	TABLE 8.5.2-1			
	Summary of Applicable State Land Use Plans and Documents for the Liquefaction Facility			
Author/Agency	Land Use Plan/Document	Acres	Potential Applicable Stipulations	
Alaska Department of Natural Resources, Division of Mining, Land & Water	Kenai Area Plan (2001)	To Be Determined	The Kenai Area Plan directs how ADNR will manage state uplands, tidelands, and submerged lands within the planning boundary. The ADNR has classified state lands to reflect the intent of land use designations. Land classified as transportation corridor (11 AAC 55.205) is land identified for the location of easements and ROW under AS 38.04.065(f), including transportation, pipeline, or utility purposes.	

Interdependent Facilities

Pipelines and Related Aboveground Facilities

Mainline

The Mainline corridor passes through multiple state managed lands (Appendix A). An overview of potentially applicable stipulations for the areas crossed is provided in Table 8.5.2-2.

TABLE 8.5.2-2				
Summary of Applicable State Land Use Plans and Documents for the Pipelines and Related Aboveground Facilities				
Author/Agency	Land Use Plan/Document	Mileposts	Potential Applicable Stipulations	
	Game Management Unit 26B	To Be Determined	Within Prudhoe Bay, closed hunting of big game.	
	Game Management Unit 25D	To Be Determined	Within Dalton Highway Corridor Management Area closed to hunting, unless taken in the area by bow & arrow only.	
Alaska Department of Fish & Game	Game Management Unit 25A	To Be Determined		
	Game Management Unit 24A	To Be Determined		
	Game Management Unit 20F	To Be Determined	Closed to use of motorcraft for hunting of big game.	
	Game Management Unit 20C	To Be Determined	Closed hunting of big game.	
	Game Management Unit 20B	To Be Determined	unless taken in the area by bow & arrow only.	
	Game Management Unit 20A	To Be Determined		
	Game Management Unit 16A	To Be Determined	Open to hunting with restrictions on motorized access during certain times of the year.	

TABLE 8.5.2-2 Summary of Applicable State Land Use Plans and Documents for the Pipelines and Related Aboveground Facilities			
Author/Agency	Land Use Plan/Document	Mileposts	Potential Applicable Stipulations
	Game Management Unit 15A	To Be Determined	Within 15A, the Kenai Controlled Use Area (encompasses the Liquefaction Facility) the area is closed to use of aircraft for hunting moose, including transportation of moose hunters before 12:01 a.m. on September 11 th .
	Game Management Unit 14C	To Be Determined	Open to hunting during specific time periods and with limits to large game.
	Game Management Unit 14A	To Be Determined	
	Game Management Unit 13E	To Be Determined	Area closed to use of any motorized vehicle or pack animal for hunting, including transportation of hunters, their hunting gear, or parts of game, from July 26 through September 30.
Alaska Department of Natural Resources, Division of Forestry	Tanana Valley State Forest Management Plan (2001 update)	To Be Determined	The plan contains the following policies: Other land management proposals may be initiated by other agencies or private individuals and may include requests for ROW, commercial leases, timber or material sales, or permits for mineral activity, trapping cabins, or grazing. The following process will be used to review these permit or conveyance requests. Applications for use of State Forest land, including mining or prospecting, will be forwarded to the Northern Regional Office of the Division of Mining, Land & Water. The Division of Mining, Land & Water will distribute the applications for review by agencies, including the Northern Regional Office of the Division of Forestry. The Division of Forestry will review applications for consistency with this plan and other existing laws and policies. The Division of Forestry will then return applications to the Division of Mining, Land & Water with stipulations for processing. The Division of Forestry may also require additional review of applications after interagency or public comment. Although preliminary decisions or final findings will continue to be made by the Division of Mining, Land & Water, applications must be consistent with the stipulations given by the Division of Forestry. No permits, leases, disposals, or ROW will be authorized for use of State Forest land that are not consistent with stipulations from the Division of Forestry. TIMBER MANAGEMENT II. MANAGEMENT GUIDELINES H. Salvage of Timber From Land Clearing Timber with commercial or personal use values should be salvaged from lands that are to be cleared for other uses such as mining, transportation or utility corridors, and habitat enhancement projects, where feasible and prudent. See Chapter 1 for statutory direction for the Tanana Valley State Forest. TRAILS G. Trail Crossings II. MANAGEMENT GUIDELINES When it is necessary for power lines, pipelines, or roads to cross trail corridors, crossings should be at 90-degree angles when feasible. An exception is when a trail corridor is deliberately combin

TABLE 8.5.2-2							
Summary of	Applicable State Land Us	e Plans and D	ocuments for the Pipelines and Related Aboveground Facilities				
Author/Agency	Land Use Plan/Document	Mileposts	Potential Applicable Stipulations				
			and resources. II. MANAGEMENT GUIDELINES J. Pipeline Crossings The ADNR should work with Alyeska Pipeline Service Company to identify options to develop new pipeline crossings. Future pipelines (such as the Trans-Alaska Gas Line) should provide more places for public crossings to state land for hunting, fishing, recreation, timber harvest, settlement, and other uses or provide a mechanism to improve or develop future public crossings as the need arises.				
Alaska Department of Natural Resources, Division of Mining, Land and Water	Tanana Basin Area Plan (1986)	To Be Determined	 The Area wide Land Management Policies listed in the plan include management guidelines relevant to pipeline development: Trail Management G. Trail Crossings. When it is necessary for power lines, pipelines, or roads to cross trail corridors, crossings should be at 90-degree angles when feasible. An exception is when a trail corridor is deliberately combined with a public utility or transportation corridor. Where feasible, vegetative screening should be preserved when a utility crosses or collocates within a trail corridor. In addition, the Transportation Goals specified in Chapter 2 apply to forms of utility or resource transportation corridors. The following transportation corridors were identified in the plan: Alaska Natural Gas Pipeline; Alaska Railroad Extension; Prince William Sound - Upper Tanana Railroad Corridor; Western Access Railroad Corridor; Twin Mountain Access Route; Parks Highway - Kantishna – McGrath Highway Corridor; Upper Wood River (Bonnifield Mining District) Access; Nenana - Totchaket Area Access; TAPS Oil Spill Contingency Plan Access Routes; and Existing transportation routes identified by the plan include the RS2477 trails and existing highways maintained and operated by ADOT&PF. Utility corridors are prohibited within the following units: Management Unit 2H: Minto; Management Unit 3E: Middle Cosna-Zitziana Watersheds. 				
Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation	Denali State Park Management Plan (2006)	To Be Determined	The plan designates land use within park boundaries. Land use designations adjacent to the Parks Highway consist of Natural Area and Recreation Development. Areas designated Natural Area are intended to be relatively undeveloped and provide users opportunities for a high-value, natural experience. Figure 11 within the plan provides guidelines for activities and facilities within the various land-use designations in the park. For both the Natural Area and Recreation Development designations, utilities, transmission lines, and pipelines are allowable by permit only when no viable alternative exists. Tower heights are limited to 85 feet. Best practices must be employed to minimize impacts to viewsheds, especially within the viewsheds of areas with high public use.				

TABLE 8.5.2-2							
Summary of	Applicable State Land Us	e Plans and D	ocuments for the Pipelines and Related Aboveground Facilities				
Author/Agency	Land Use Plan/Document	Mileposts	Potential Applicable Stipulations				
Alaska Department of Natural Resources, Division of Mining, Land and Water	Dalton Highway Master Plan (1998)	To Be Determined	The plan specifies development nodes along the Dalton Highway Corridor at the following locations: Yukon River Crossing, Coldfoot, Chandalar Shelf, Happy Valley, and Deadhorse. Each node is a distinct and compact cluster of development. Oil and gas development activities, transportation, and incidental or minor governmental activities are allowed to locate outside of nodes if the needs of the activity are demonstrably better met outside the nodes.				
Alaska Department of Natural Resources, Division of Mining, Land and Water	Kenai Area Plan (2001)	To Be Determined	The Kenai Area Plan directs how ADNR will manage state uplands, tidelands, and submerged lands within the planning boundary. The ADNR has classified state lands to reflect the intent of land use designations. Land classified as transportation corridor (11 AAC 55.205) is land identified for the location of easements and rights-of-way under AS 38.04.065(f), including transportation, pipeline, or utility purposes.				
Alaska Department of Natural Resources, Division of Mining, Land and Water	Alexander Creek State Recreation River (SRR)	To Be Determined	No known studies or plans available.				
Alaska Department of Natural Resources, Division of Mining, Land and Water	Kroto Creek & Moose Creek SRR	To Be Determined	No known studies or plans available.				
Alaska Department of Fish & Game	Minto Flats State Game Refuge Management Plan (1992)	To Be Determined	The Minto Flats State Game Refuge Management Plan contains policies related to transportation/utility corridors through the refuge: Transportation and utility corridors, including railroads, roads, power lines, and pipelines may be sited on refuge lands if they are determined to be compatible with the purposes for which the refuge was established. Proposals will be evaluated for compatibility with the refuge purposes listed in legislation and reflected in the goals of this plan: (1) protection and enhancement of habitat resources; (2) conservation of fish and wildlife populations; and (3) the continuation of fishing, hunting, trapping, and other public uses compatible with habitat protection and enhancement and fish and wildlife conservation. Additionally, corridor proposals must demonstrate a significant public need for the corridor that cannot be reasonably met off-refuge, that the use of refuge lands and impacts to refuge resources are avoided or minimized to the maximum extent feasible, that public access to the refuge is maintained, and that impacts to refuge resources are fully mitigated. Given the distribution of habitats and public uses within the refuge, the potential for incompatibility between corridor development and resource values appears to be greater within the portion of the refuge north of the Tanana River. Therefore, the highest priority should be given to avoiding the future siting of transportation and utility corridors in the most valuable refuge habitats north of the Tanana River.				

TABLE 8.5.2-2							
Summary of	Summary of Applicable State Land Use Plans and Documents for the Pipelines and Related Aboveground Facilities						
Author/Agency	Land Use Plan/Document	Mileposts	Potential Applicable Stipulations				
Alaska Department of Fish & Game	Susitna Flats Management Plan (1988)	To Be Determined	New utilities may be allowed to cross the refuge where no feasible off- refuge alternative exists, using existing corridors wherever possible, consistent with refuge goals and objectives.				
			A special use permit is required for any construction work in Susitna Flats State Game Refuge.				

PBTL

The actual footprint of the PBTL will be identified during the Pre-FEED process. The pipeline will be located on state-managed lands under lease to the PBU,

PTTL

The actual footprint of the PTTL will be identified during the Pre-FEED process. The PTTL corridor crosses Game Management Unit 26B III (Table 8.5.2-2). As facility sites are refined in the Pre-FEED process, state land crossings will be determined and presented in a subsequent draft of this Resource Report.

Aboveground and Ancillary Facilities

The locations of the aboveground (e.g., compressor stations, heater stations, meter stations, MLBVs) and ancillary facilities (e.g., construction camps, access roads, contractor yards) are not known at this time. As facility sites are defined in the Pre-FEED process, state land crossings will be determined and presented in a subsequent draft of this Resource Report.

GTP

The GTP will be located on state-managed lands (Appendix A). An overview of the potentially applicable stipulations for the areas crossed is provided in Table 8.5.2-3.

TABLE 8.5.2-3									
Summary of Applicable State Land Use Plans and Documents for the GTP									
Author/Agency	Land Use Plan/Document	Land Use Acres Potential Applicable Stipulations							
Alaska Department of Fish & Game	Game Management Unit 26B	To Be Determined	Within Prudhoe Bay, closed hunting of big game. Within Dalton Highway Corridor Management Area closed to hunting, unless taken in the area by bow and arrow only.						

8.5.3 Local and Other Management Areas

Information concerning local borough and municipality managed lands which will be crossed by the Project will be defined in the Pre-FEED process, presented in a subsequent draft of this Resource Report, and included in Table 8.5-1. The information below provides a brief overview of these local and other special management areas.

8.5.3.1 Alaska Native Regional and Village Corporations

In 1971, President Richard Nixon signed into law the Alaska Native Claims Settlement Act (ANCSA) (43 U.S.C. § 1601 et seq.). Under ANCSA, aboriginal financial and land claims were settled in exchange for \$962.5 million in compensation, as well as approximately 40 million acres (Norris, 2002). ANCSA established 12 for-profit Alaska Native regional corporations (a 13th corporation was later added for Alaska Natives living outside the state). In addition, more than 200 Alaska Native village corporations were created. Both the regional and village corporations own land in and around native villages, with ownership proportionate to the enrolled populations of these corporations during the 1970s. Surface rights to the land are owned by the village and regional corporations are owned by enrolled Alaska Natives. Approximately 80,000 Natives are enrolled under ANCSA, and receive 100 shares each for the village corporation in which they are enrolled and the same amount for the regional corporation in which they are enrolled.

Native corporation land is often held in large tracts and used for subsistence purposes or developed to generate revenue for the corporation. The Toghotthele Corporation, a Native village corporation representing the Native village of Nenana, as well as the Tyonek and Salmatof Corporations own surface rights to parcels within the Project area. As private land, uses on land owned by native corporations are subject to an easement with the surface landowners.

8.5.3.2 Native Allotments

Under the Alaska Native Allotment Act of 1906 (34 Stat 197), qualifying Alaska Natives were allotted up to 160 acres of non-mineral land. The Project study corridor does intersect Alaska Native Allotments awarded under this act, however, the final route and workspace would not impact these allotments. The Tanana Chiefs Conference manages a trust service with the Bureau of Indian Affairs and acts as trustee for native allotment property owners on behalf of the 42 villages of Interior Alaska. The Inupiat Community of the Arctic Slope also manages a trust service with BIA to act as trustee for the Native allotment owners on the North Slope.

8.5.3.3 Private Landowners

Private lands in the Project area are used for residential, agricultural, and commercial purposes. As private land, land uses are subject to approvals of the landowner.

8.5.3.4 Summary of Applicable Local Land Use Plans

Liquefaction Facility

The actual footprint of the Liquefaction Facility, including ancillary facilities, will be identified during the Pre-FEED process. Table 8.5.3-1 demonstrates how information concerning potentially applicable stipulations for the areas crossed will be presented in a subsequent draft of this Resource Report, once further details are known.

TABLE 8.5.3-1								
Summary of Applicable Local Land Use Plans and Documents for the Liquefaction Facility								
Name	Type of Public Land	Acres	Potential Applicable Stipulations					

Interdependent Facilities

Pipelines and Related Aboveground Facilities

Mainline

The actual footprint of the Mainline will be identified during the Pre-FEED process. Table 8.5.3-2 demonstrates how information concerning potentially applicable stipulations for the areas crossed will be presented in subsequent drafts of this Resource Report once further details are known.

TABLE 8.5.3-2						
Summary of Applicable Local Land Use Plans and Documents for the Pipelines and Related Aboveground Facilities						
Name	Type of Public Land Mileposts Potential Applicable Stipulations					

PBTL

The Project is currently evaluating construction and operation ROW widths for the pipeline. The actual footprint of the pipeline will be identified during the Pre-FEED process. As facility sites are refined in the Pre-FEED process, local land designations will be determined and presented in a subsequent draft of this Resource Report.

PTTL

The Project is currently evaluating construction and operation ROW widths for the PTTL. The actual footprint of the PTTL will be identified during the Pre-FEED process. As facility sites are refined in the Pre-FEED process, local land designations will be determined and presented in a subsequent draft of this Resource Report.

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Aboveground and Ancillary Facilities

The locations of the aboveground (e.g., compressor stations, heater stations, meter stations, MLBVs) and ancillary facilities (e.g., construction camps, access roads, contractor yards) are not known at this time. As facility sites are refined in the Pre-FEED process, local land designations will be determined and presented in a subsequent draft of this Resource Report.

GTP

The actual footprint of the GTP, including ancillary facilities, will be identified during the Pre-FEED process. Table 8.5.3-3 demonstrates how information concerning potentially applicable stipulations for the lands that are crossed will be presented in a subsequent draft of this Resource Report once further details are known.

TABLE 8.5.3-3						
	Summary of Appli	cable Local L	and Use Plans and Documents for the GTP			
Name	Type of Public Land	Acres	Potential Applicable Stipulations			

8.6 RECREATION AND SPECIAL INTEREST AREAS

Recreation and special interest areas were identified within 0.25-mile of the Liquefaction Facility and Interdependent Facilities which included a 2,000-foot wide corridor and the GTP (Appendix A). The actual footprint of the Project facilities, including ancillary facilities, will be identified during the Pre-FEED process. Table 8.6-1 demonstrates how information concerning these areas will be presented in a subsequent draft of this Resource Report once further details are known. This will include coordination with BLM staff to obtain specific location information for certain recreational areas (e.g., campgrounds, waysides, interpretive roadside areas). The identified areas are depicted on Figure 8.6-1.

8.6.1 National Wild and Scenic Rivers System

U.S. Congress established the National and Wild Scenic Rivers System in 1968 (Public Law 90-542; 16 USC Chapter § 1271 et seq.) for the purpose of preserving rivers that "possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or similar values." Rivers that qualify for preservation under this legislation can be designated by the U.S. Congress or by the Secretary of the Interior (USFWS, 2014). Within Alaska, 3,210 river miles are designated as wild and scenic, comprising approximately 1 percent of the total river miles within the state. Of the wild and scenic rivers in Alaska, none occur within the Project area. The nearest wild and scenic river to the Project is the North Fork of the Koyukuk River, which is located in the Gates of the Arctic National Park, approximately 12 miles west of the Mainline corridor, at a point approximately 7 miles north of the southern limits of the national park (USFWS, 2014).





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FIGURE 8.6-1 Alaska L

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	TABLE 8.6-1									
	Re	creation an	d Special Inte	erest Areas	within 0.	25-Mile	of the Alas	ka LNG Project	1	1
				Distance	Milep	ost	-			
Name	Type of Public Land	Project Facility	Segment/ Borough or Census Area	Direction from Alaska LNG Project Area	Begin	End	Crossing Length (miles)	Acreages Affected By Construction and Operation	Primary Use	Managing Entity
Iditarod National Historic Trail	Federal	Mainline	Matanuska – Susitna Borough		To Be Determined				BLM	
James Dalton Highway Corridor	State	Mainline	North Slope Borough & Yukon- Koyukuk Census Area		To Be Determined				ADNR	
Arctic National Wildlife Refuge	Federal	Mainline	North Slope Borough		No Project facilities in Arctic NWR					USFWS
Minto Flats SGR	State	Mainline	Yukon- Koyukuk Census Area		To Be Determined				ADF&G	
Denali National Park	Federal	Mainline	Denali Borough		To Be Determined				NPS	
Denali State Park	State	Mainline	Denali Borough		To Be Determined				ADNR	
Nenana River Gorge Special Use Area	State	Mainline	Denali Borough			т	o Be Determ	ined		ADNR DMLW
Tanana Basin Planning Area	State	Mainline	Yukon- Koyukuk / Denali Borough			Т	o Be Determ	ined		ADNR
Alexander Creek SRR	State	Mainline	Matanuska – Susitna Borough			т	o Be Determ	ined		ADNR
Kroto Creek and Moose Creek SRR	State	Mainline	Matanuska – Susitna Borough		To Be Determined				ADNR	
Susitna Flats SGR	State	Mainline	Matanuska – Susitna Borough		To Be Determined					ADF&G
Tanana Valley State Forest	State	Mainline	Yukon- Koyukuk Census Area and Fairbanks North Star Borough			Т	o Be Determ	ined		ADNR

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	TABLE 8.6-1									
	Recreation and Special Interest Areas within 0.25-Mile of the Alaska LNG Project									
				Distance	Milepost					
Name	Type of Public Land	Project Facility	Segment/ Borough or Census Area	and Direction from Alaska LNG Project Area	Begin	End	Crossing Length (miles)	Acreages Affected By Construction and Operation	Primary Use	Managing Entity
ADNR, DMLW, SCRO Classification and Easement	State	Mainline	Matanuska – Susitna Borough	Matanuska – Susitna To Be Determined Borough						ADNR
RS2477 Trails	Federal, State, or Private ^A	Mainline		To Be Determined AE						
ANSCA 17(b) Easement Crossing Private Land ^C Mainline To Be Determined BLM								BLM		
Source: ^A http://dnr.alas ^B http://dnr.alas ^C http://www.blu	Source: ^A http://dnr.alaska.gov/commis/cacfa/documents/FOSDocuments/KentSullivanRS2477WhitePaper.pdf ^B http://dnr.alaska.gov/mlw/factsht/rs2477.pdf ^C http://www.blm.gov/ak/st/en/prog/lands_realty/17b_easements.html									

8.6.2 National Trails System

The federal National Trails System Act of 1968 (16 USC § 1241) instituted a national system of scenic, historic, and recreational trails throughout the U.S. The purpose of the National Trails System Act was to provide federal assistance to volunteer citizen groups in the planning, development, maintenance, and management of designated trails (NPS, 2012). The only trail in Alaska within the National Trails System is the Iditarod National Historic Trail, an approximately 2,000-mile trail that spans between Seward and Nome, Alaska. The Mainline corridor intersects the Iditarod National Historic Trail approximately 35 miles northwest of Anchorage.

8.6.3 Areas of Historical or Cultural Significance

Information regarding areas of historical or cultural significance is provided in draft Resource Report No. 4.

8.6.4 Recreational Sites and Special Use Areas

The Project area is located within 0.25-mile of two federally managed recreational sites; the Denali NPP and Arctic NWR. These areas are discussed in Sections 8.5.1.2 and 8.5.1.3, respectively. The Mainline corridor crosses the Denali NPP boundary; however, the area is anticipated to be avoided during route refinement. The Project area will be located directly adjacent to the eastern boundary of this NPP. Denali NPP encompasses approximately 6 million acres of land, including Mount McKinley. The park provides a variety of outdoor recreational opportunities, including backpacking, hiking, camping, and mountain climbing.

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The Arctic NWR is located in Northeastern Alaska and is managed by the USFWS. The Arctic NWR has no roads, so primary access is by air. However, the Dalton Highway, located west of the Arctic NWR boundary, provides access to the refuge's perimeter. The Arctic NWR was established in 1960 for the purpose of protecting its wilderness qualities as outlined in the *Arctic National Wildlife Refuge Comprehensive Conservation Plan* (USFWS, 1988). Recreational opportunities in the Arctic NWR include hiking, hunting, camping, floating, and climbing. The USFWS recorded a total of over 1,000 visits to the Arctic NWR in 2009, which is consistent with the number of annual visits recorded since the early 1980s when the USFWS first begin recording visitation numbers. Approximately 88 percent of the visits to the Arctic NWR are provided by commercial operators acting as a guide or providing air transport (USFWS, 2010). The Mainline corridor is located approximately 0.2-mile west of the western limits of Arctic NWR, just east of Galbraith Lake. The existing Point Thomson Unit, from which natural gas will be transported through the PTTL, is located to the west of Section 1002 of Arctic NWR on the Arctic coastal plain.

Denali State Park occurs within 0.25-mile of the Project area. This State Park is a 325,240 acre area located along the George Parks Highway (Hwy 3) at the southeastern base of Mount McKinley. Denali State Park includes a variety of formal and informal camping, fishing, hiking, and other recreational opportunities (ADNR, 2014). The Mainline corridor crosses an approximately 33-mile-long segment of the park along the George Parks Highway (Hwy 3). This highway corridor bisects the park into two tracts of land located north and south of the highway. Denali State Park is considered a 6(f) property under the LWCF Act (16 USC § 4601). Section 6(f) of the LWCF Act requires that no property acquired or developed with LWCF assistance should be converted to a use other than public outdoor recreational uses without the prior approval of the Secretary of the Interior.

The ADNR Division of Mining, Land & Water manages "special use lands" to protect areas that have been designated pursuant to 11 AAC 96.014 as having scenic, historic, archaeological, scientific, biological, recreational, or other special resource values that have been determined as warranting additional protections and special requirements. One ADNR-designated special use area is located within 0.25-mile of the Project area, the Nenana River Gorge Special Use Area. This special use area is an approximately 5-mile-long and 0.5-mile-wide area located on the eastern banks of the Nenana River, approximately 3,800 feet north of the intersection of Park Road and Highway 3.

The Project area also contains:

- Approximately 4.32 acres of state-designated recreational land managed by ADNR; and
- 28 Revised Statute 2477 trails.

These areas are used primarily for recreational activities such as for snow machining, dogsledding, and by four-wheel all-terrain vehicles (see Section 8.6.6).

8.6.5 Scenic Byways

The Project area occurs within 0.25-mile of the Dalton Highway (Alaska Route 11) and George Parks Highway (Alaska Route 3), both of which are designated Scenic Byways through the Alaska Scenic Byways program administered by ADOT&PF's Division of Parks and Outdoor Recreation. The Scenic Byways program was established by the State of Alaska in 1993 and allows for grant funding to be obtained to promote the byways' special qualities and also makes these routes eligible for designation as a

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Scenic Byway through the national scenic byways program administered by the Federal Highway Administration (ADOT, 2011).

8.6.6 Revised Statute 2477 Rights-of-Way and 17(b) Easements

Revised Statute (RS) 2477 of Section 8 of the Mining Law of 1866 states: "The right of way for the construction of highways over public lands, not reserved for public uses, is hereby granted." Although the law was repealed by Congress with the enactment of FLPMA in 1976, the pre-existing rights attributable to RS2477 trails established under the statute remain in effect. While the existence and exact nature of Revised Statute 2477 ROWs may be subject to legal determination, such ROWs, where established, may include ongoing access rights to many rural destinations, including by snow-machines, dogsled teams, and four-wheel all-terrain vehicles. The Project planning area includes 28 described RS2477 trails (Table 8.6-1; Appendix A).

The Project area intersects special use areas which are easements designated under ANSCA Section 17(b), which authorizes reserving easements on lands that will be conveyed to Alaska Native Village and Regional Corporations to allow public access to public land and water. 43 C.F.R. § 2650.4-7 describes the guidelines that are used in reserving easements in conveyance documents. 17(b) easements are reserved and managed by the federal government. Thirteen 17(b) easements have been identified in the Project area (Table 8.6-1; Appendix A).

8.6.7 Summary of Applicable Recreational Sites and Special Use Area Stipulations

8.6.7.1 Liquefaction Facility

The proposed footprint of the Liquefaction Facility, including ancillary facilities, will be identified during the Pre-FEED process. Table 8.6.7-1 demonstrates how information concerning the applicable stipulations of recreational sites and special use areas will be presented in a subsequent draft of this Resource Report once further details are known.

TABLE 8.6.7-1							
Summary of Applicable Recreational Sites and Special Use Area Stipulations for the Liquefaction Facility							
Name	Type of Recreational Site or Special Use Area	Acres	Potential Applicable Stipulations				

8.6.7.2 Interdependent Facilities

Pipelines and Related Aboveground Facilities

Mainline

The proposed footprint of the Mainline will be identified during the Pre-FEED process. Table 8.6.7-2 demonstrates how information concerning the applicable stipulations of recreational sites and special use areas will be presented in a subsequent draft of this Resource Report once further details are known.

TABLE 8.6.7-2								
Summary of Applicable Recreational Sites and Special Use Area Stipulations for the Pipelines and Related Aboveground Facilities								
Name	Type of Recreational Site or Special Use Area	Mileposts	Potential Applicable Stipulations					

PBTL

The Project is currently evaluating construction and operation ROW widths for the pipeline. The actual footprint of the pipeline will be identified during the Pre-FEED process. As facility sites are refined in the Pre-FEED process, recreational sites and special use areas crossed will be identified and presented in a subsequent draft of this Resource Report.

<u>PTTL</u>

The Project is currently evaluating construction and operation ROW widths for the PTTL. The actual footprint of the PTTL will be identified during the Pre-FEED process. As facility sites are refined in the Pre-FEED process, recreational sites and special use areas crossed will be identified and presented in a subsequent draft of this Resource Report.

Aboveground and Ancillary Facilities

The locations of the aboveground (e.g., compressor stations, heater stations, meter stations, MLBVs) and ancillary facilities (e.g., construction camps, access roads, contractor yards) are not known at this time. As facility sites are identified in the Pre-FEED process, recreational sites and special use areas which are crossed will be identified and presented in a subsequent draft of this Resource Report.

GTP

The actual footprint of the GTP, including ancillary facilities, will be identified during the Pre-FEED process. Table 8.6.7-3 demonstrates how information concerning the applicable stipulations of recreational sites and special use areas will be presented in a subsequent draft of this Resource Report.

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TABLE 8.6.7-3							
Summary of Applicable Recreational Sites and Special Use Area Stipulations for the GTP							
Name	Type of Recreational Site or Special Use Area	Acres	Potential Applicable Stipulations				

8.7 HAZARDOUS WASTE SITES, CONTAMINATION, AND LANDFILLS

A desktop review was conducted for the Project of the available information regarding known or potentially hazardous waste sites and contamination within 0.25-mile of the Liquefaction Facility and Interdependent Facilities, which included a 2,000-foot wide corridor and the GTP (Appendix C). The proposed footprint of the Project facilities, including ancillary facilities will be identified during the Pre-FEED process. Table 8.7-1 demonstrates how information concerning these areas will be presented in a subsequent draft of this Resource Report once further details are known. The identified areas are depicted on Figure 8.7-1.

The desktop review included the following data sources:

- U.S. Environmental Protection Agency (EPA);
- Alaska Department of Environmental Conservation (ADEC) Contaminated Sites Database (CSD); and
- ADEC Solid Waste Information Management System (SWIMS).

Information concerning quarries and mines located within the Project area is provided in draft Resource Report No. 6.

8.7.1 US Environmental Protection Agency National Priority List

Section 105(a) (8) (B) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires that the statutory criteria provided by the Hazard Ranking System (HRS) be used to prepare a list of national priorities among the known releases or threatened release of hazardous substances, pollutants, or contaminants throughout the U.S. (EPA, 2012). This list is referred to as the National Priority List (NPL). The NPL is intended to guide the EPA in determining which sites warrant further investigation, identify what CERCLA financed remedial actions may be appropriate, notify the public of those sites EPA believes warrant further investigation, and serve notice to potentially responsible parties that EPA may initiate CERCLA finance remedial action (EPA, 2012).

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TABLE 8.7-1									
	Hazardous Was	ste Sites, Cont	amination, ar	id Landfills w	ithin 0.25-Mile of	the Alaska L	.NG Project ^ª	1.	
				Segment/	Distance and		Crossing	Acreage	Description of
Name	Type of Facility	Listing	Project Facility	Borough or	Direction from Alaska	Milepost	Length (miles)	Affected By	Contamination
				Area	Area	Begin	End		Construction
Tesoro Northstore #201- Nikiski	LUST	Cleanup Complete - Institutional Controls	LNG Plant		Within				
Tesoro South Terminal	LUST	Cleanup Complete	LNG Plant		Within				
UNOCAL Chemical Plant - drain	Contaminated Site	Open	LNG Plant		Within				
UNOCAL Chemical - Sulfinol Spill	Contaminated Site	Open	LNG Plant		Within				
UNOCAL/Agrium Ammonia Urea Plant	Contaminated Site	Open	LNG Plant		Within				
UNOCAL Ammonia Plant	Contaminated Site	Open	LNG Plant		Within				
UNOCAL Chemical Diesel Spill	Contaminated Site	Open	LNG Plant		Within				
Tesoro Alaska Refinery	Contaminated Site	Open	LNG Plant		Within 0.25 mile from facility				
Phillips Petroleum LNG Plant	Contaminated Site	Cleanup Complete	LNG Plant		Within 0.25 mile from facility				
Tesoro KPL Facility - 1999	Contaminated Site	Open	LNG Plant		Within 0.25 mile from facility				
Phillips Petroleum LNG Plant-2002	Contaminated Site	Open	LNG Plant		Within 0.25 mile from facility				
Agrium Kenai Nitrogen Operations	EPA Designated Site		LNG Plant		Within				
Atigun Incorporated	EPA Designated Site		LNG Plant		Within				

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TABLE 8.7-1 Hazardous Waste Sites, Contamination, and Landfills within 0.25-Mile of the Alaska LNG Project ^a									
				Segment/	Distance and		Crossing	Acreage	Description of
Name	Type of Facility	Listing	Project Facility	Borough	Direction from Alaska	Milepost	Length (miles)	Affected By	Contamination
				Area	LNG Project Area	Begin	End		Construction
BP GTL Facility	EPA Designated Site		LNG Plant		Within				
Emerald Alaska, Inc.	EPA Designated Site		LNG Plant		Within				
Envirotech	EPA Designated Site		LNG Plant		Within				
Kenai Pipeline Co	EPA Designated Site		LNG Plant		Within				
Nikiski Co-Generation	EPA Designated Site		LNG Plant		Within				
Nikiski Generation Plant	EPA Designated Site		LNG Plant		Within				
Tesoro Alaska Company, Nikiski Terminal	EPA Designated Site		LNG Plant		Within				
Chevron USA, Inc.	EPA Designated Site		LNG Plant		Within 0.25 mile from facility				
Chevron USA Inc. Alaska Refinery	EPA Designated Site		LNG Plant		Within 0.25 mile from facility				
ConocoPhilips Alaska - Beluga River Unit	EPA Designated Site		LNG Plant		Within 0.25 mile from facility				
ConocoPhillips Kenai LNG Plant	EPA Designated Site		LNG Plant		Within 0.25 mile from facility				

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TABLE 8.7-1									
Hazardous Waste Sites, Contamination, and Landfills within 0.25-Mile of the Alaska LNG Project ^a									
				Segment/	Distance and Direction from Alaska		Crossing	Acreage	Description of
Name	Type of Facility	Listing	Project Facility	Borough or		Milepost	Length (miles)	Affected By	Contamination
				Area	Area	Begin	End		Construction
Kenai Liquefied Natural Gas (LNG) Plant	EPA Designated Site		LNG Plant		Within 0.25 mile from facility				
Tesoro Alaska - Kenai Refinery	EPA Designated Site		LNG Plant		Within 0.25 mile from facility				
Cantwell ADOT&PF Inert Waste Landfill	Solid Waste	Retired	Mainline		Within the Corridor				
Nome ADOT&PF Inert Waste Landfill Site	Solid Waste	Retired	Mainline		Within the Corridor				
Alyeska Old Man Camp 87-1	Solid Waste	Retired	Mainline		Within the Corridor				
Alyeska Pump Station #6 (DS 77-3)	Solid Waste	Retired	Mainline		Within the Corridor				
Alyeska Franklin Bluffs Pipeline Camp	Solid Waste	Retired	Mainline		Within 0.25 mile of Corridor				
Ft. Greely Black Rapids TRNG	Solid Waste	Retired	Mainline		Within 0.25 mile of Corridor				
Alyeska Pump Station #4 (DS 114- 0) Galbraith Lake	Solid Waste	Retired	Mainline		Within 0.25 mile of Corridor				
Alyeska Pump Station #4 (DS 114- 1.0)	Solid Waste	Retired	Mainline		Within 0.25 mile of Corridor				
Alyeska Pipeline Site 100-1 Camp	Solid Waste	Active	Mainline		Within 0.25 mile of Corridor				
AIMM Nikiski Drilling Waste	Solid Waste	Under Constructio n	Mainline		Within 0.25 mile of Corridor				
USFS Nemo Point Rock Pit #6762 GP	Solid Waste	Retired	Mainline		Within 0.25 mile of Corridor				

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Hazardous Waste Sites, Contamination, and Landfills within 0.25-Mile of the Alaska LNG Project ^a									
				Segment/	Distance and Direction from Alaska		Crossing	Acreage	Decerintian of
Name	Type of Facility	Listing	Project Facility	Borough or		Milepost	Length (miles)	Affected By	Contamination
			-	Area	Area	Begin	End		Construction
Dresser Atlas-Mile 22.5 North Kenai Road	LUST	Cleanup Complete - Institutional Controls	Mainline		Within the Corridor				
ADOT&PF Chulitna Maintenance	LUST	Cleanup Complete - Institutional Controls	Mainline		Within the Corridor				
Denali Air - McKinley Airstrip	LUST	Cleanup Complete	Mainline		Within the Corridor				
TBE Machine Company	LUST	Cleanup Complete	Mainline		Within the Corridor				
Alascom - Nikishka Repeater	LUST	Cleanup Complete	Mainline		Within 0.25 mile of Corridor				
Rigtenders Heliport	LUST	Cleanup Complete	Mainline		Within 0.25 mile of Corridor				
Nikiski Fire Department #2	LUST	Cleanup Complete	Mainline		Within 0.25 mile of Corridor				
ARR - Hurricane former UST site	LUST	Open	Mainline		Within 0.25 mile of Corridor				
ARR - Ferry RR Section	LUST	Cleanup Complete	Mainline		Within 0.25 mile of Corridor				
Reindeer Mountain Lodge	LUST	Cleanup Complete	Mainline		Within 0.25 mile of Corridor				
Alyeska Happy Valley Camp West	Contaminated Site	Open	Mainline		Within the Corridor				

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TABLE 8.7-1										
Hazardous Waste Sites, Contamination, and Landfills within 0.25-Mile of the Alaska LNG Project ^a										
				Seament/	Distance and Direction from Alaska LNG Project Area		Crossing Length (miles)	Acreage Affected By	Description of	
Name	Type of Facility	Listing	Project Facility	Borough or		Milepost			Contamination	
			-	Area		Begin	End		Construction	
Alyeska Happy Valley Camp East	Contaminated Site	Cleanup Complete - Institutional Controls	Mainline		Within the Corridor					
Shell Western Middle Ground Shoal	Contaminated Site	Cleanup Complete	Mainline		Within the Corridor					
AMOCO East Forelands Facility	Contaminated Site	Cleanup Complete	Mainline		Within the Corridor					
Nikiski Airstrip	Contaminated Site	Cleanup Complete - Institutional Controls	Mainline		Within the Corridor					
Schlumberger Wireline Services	Contaminated Site	Cleanup Complete	Mainline		Within the Corridor					
Alaska West Transport	Contaminated Site	Cleanup Complete	Mainline		Within the Corridor					
Alyeska Dan Creek Spill	Contaminated Site	Cleanup Complete	Mainline		Within the Corridor					
Alyeska PS 06 JP4 Fueling Facility	Contaminated Site	Cleanup Complete - Institutional Controls	Mainline		Within the Corridor					
Beaver Creek Lact Unit	Contaminated Site	Open	Mainline		Within the Corridor					
Tesoro KPL Middle Ground Shoal Fac	Contaminated Site	Open	Mainline		Within the Corridor					
Alyeska PS 06 Fueling Area	Contaminated Site	Open	Mainline		Within the Corridor					
Middle Ground Shoals Onshore Fac.	Contaminated Site	Open	Mainline		Within the Corridor					
Kenai Pipeline Oily Water Sewer Sys	Contaminated Site	Open	Mainline		Within the Corridor					
Shell Onshore Facility - Landfarm	Contaminated Site	Cleanup Complete	Mainline		Within the Corridor					

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			anniation, ai	Segment/	Distance and		Crossing	Acreage	Description of
Name	Type of Facility	Listing	Project Facility	Borough or	Direction from Alaska LNG Project Area	Milepost	Length (miles)	Affected By	Contamination
			-	Area		Begin	End		Construction
Alyeska PS 06 Therminol Spill Site	Contaminated Site	Cleanup Complete	Mainline		Within the Corridor				
Alyeska PS 06 Leach Field /Fuel Island	Contaminated Site	Open	Mainline		Within the Corridor				
TBE Machine	Contaminated Site	Open	Mainline		Within the Corridor				
Alyeska PS 06 Jet Shed	Contaminated Site	Cleanup Complete - Institutional Controls	Mainline		Within the Corridor				
Tesoro KPL Facility - 1999	Contaminated Site	Open	Mainline		Within the Corridor				
ADOT&PF Dalton Highway Mile 152.7	Contaminated Site	Cleanup Complete	Mainline		Within the Corridor				
Marathon East Forelands Flare Pit	Contaminated Site	Cleanup Complete	Mainline		Within the Corridor				
ADOT&PF Bernice Lake Maintenance Facility	Contaminated Site	Cleanup Complete	Mainline		Within the Corridor				
Alyeska PS 06 Former Mainline Turbine Sump	Contaminated Site	Cleanup Complete	Mainline		Within the Corridor				
Alyeska Five Mile Airstrip	Contaminated Site	Cleanup Complete	Mainline		Within the Corridor				
Bernice Lake Power Plant	Contaminated Site	Cleanup Complete	Mainline		Within the Corridor				
Alyeska Remote Gate Valve 35A	Contaminated Site	Open	Mainline		Within the Corridor				
ADNR Arctic Wilderness Lodge	Contaminated Site	Cleanup Complete	Mainline		Within 0.25 mile of Corridor				
Alyeska Franklin Bluffs Camp	Contaminated Site	Cleanup Complete - Institutional Controls	Mainline		Within 0.25 mile of Corridor				

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Hazardous Waste Sites, Contamination, and Landfills within 0.25-Mile of the Alaska LNG Project ^a										
				Segment/	Distance and		Crossing	Acreage	Description of	
Name	Type of Facility	Listing	Project Facility	Borough or	Direction from Alaska LNG Project Area	Milepost	Length (miles)	Affected By	Contamination	
				Area		Begin	End		Construction	
Alyeska Milepost 108.1	Contaminated Site	Cleanup Complete	Mainline		Within 0.25 mile of Corridor					
Alyeska PS 04 Deadleg Excavation	Contaminated Site	Open	Mainline		Within 0.25 mile of Corridor					
Alyeska PS 04 Fuel Island Area	Contaminated Site	Cleanup Complete	Mainline		Within 0.25 mile of Corridor					
Alyeska PS 04 Mainline Turbine Sump	Contaminated Site	Cleanup Complete - Institutional Controls	Mainline		Within 0.25 mile of Corridor					
Arness Septage	Contaminated Site	Open	Mainline		Within 0.25 mile of Corridor					
AT&T Alascom Birch Creek Repeater	Contaminated Site	Cleanup Complete	Mainline		Within 0.25 mile of Corridor					
Baker Oil Tools - Delores Drive	Contaminated Site	Open	Mainline		Within 0.25 mile of Corridor					
Chevron ASRC Pipeline	Contaminated Site	Open	Mainline		Within 0.25 mile of Corridor					
Chevron USA Refinery-Nikiski	Contaminated Site	Open	Mainline		Within 0.25 mile of Corridor					
Coldfoot Camp Generator Release	Contaminated Site	Open	Mainline		Within 0.25 mile of Corridor					
Coldfoot Services	Contaminated Site	Cleanup Complete - Institutional Controls	Mainline		Within 0.25 mile of Corridor					

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				Seament/	Distance and Direction from Alaska LNG Project Area		Crossing Length (miles)	Acreage	Description of
Name	Type of Facility	Listing	Project Facility	Borough or		Milepost		Affected By	Contamination
				Area		Begin	End		Construction
ConocoPhillips Nora Federal 1	Contaminated Site	Cleanup Complete	Mainline		Within 0.25 mile of Corridor				
FAA Summit Flight Service Station	Contaminated Site	Open	Mainline		Within 0.25 mile of Corridor				
FAA Summit NDB/RCO	Contaminated Site	Open	Mainline		Within 0.25 mile of Corridor				
Kenai Pipeline Co.	Contaminated Site	Open	Mainline		Within 0.25 mile of Corridor				
McGahan Utilities	Contaminated Site	Cleanup Complete - Institutional Controls	Mainline		Within 0.25 mile of Corridor				
Petro Marine Services - Arness Dock	Contaminated Site	Cleanup Complete	Mainline		Within 0.25 mile of Corridor				
Phillips Petroleum LNG Plant	Contaminated Site	Cleanup Complete	Mainline		Within 0.25 mile of Corridor				
Rigtenders Heliport	Contaminated Site	Cleanup Complete	Mainline		Within 0.25 mile of Corridor				
Tesoro Alaska Refinery	Contaminated Site	Open	Mainline		Within 0.25 mile of Corridor				
Tesoro KPL Bernice Creek Plume	Contaminated Site	Open	Mainline		Within 0.25 mile of Corridor				
VECO Three Mile Creek Camp	Contaminated Site	Cleanup Complete	Mainline		Within 0.25 mile of Corridor				

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TABLE 8.7-1									
Hazardous Waste Sites, Contamination, and Landfills within 0.25-Mile of the Alaska LNG Project ^a									
				Segment/	Distance and		Crossing	Acreage	Description of
Name	Type of Facility	Listing	Project Facility	Borough or	Direction from Alaska	Milepost	Length (miles)	Affected By	Contamination
				Area	Area	Begin	End		Construction
Alyeska Pipeline Station 6 - Yukon Response Base	EPA Designated Site		Mainline		Within the Corridor				
Bernice Lake Power Plant	EPA Designated Site		Mainline		Within the Corridor				
Bp Exploration - Greater Prudhoe Bay North Slope	EPA Designated Site		Mainline		Within the Corridor				
Bristow - Alyeska Station 6	EPA Designated Site		Mainline		Within the Corridor				
Chandalar Shelf	EPA Designated Site		Mainline		Within the Corridor				
Era Aviation Inc. Heliport	EPA Designated Site		Mainline		Within the Corridor				
Five Mile	EPA Designated Site		Mainline		Within the Corridor				
Michael Kinsbury / White Creek	EPA Designated Site		Mainline		Within the Corridor				
XTO Energy Corporation Inc.	EPA Designated Site		Mainline		Within the Corridor				
Alaska DOT and PF - Oksrukuyik Creek First Crossing Culvert Replacement	EPA Designated Site		Mainline		Within 0.25 mile of Corridor				
Alaska Dot And Pf - Tea Lake Outlet 4-1 Culvert Replacement	EPA Designated Site		Mainline		Within 0.25 mile of Corridor				
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TABLE 8.7-1 Hazardous Wasta Sites, Contamination, and Landfills within 0.25 Mile of the Alaska LNG Brainet ^a												
				Sogmant/	Distance and	LINE AIABAA L	Crossing	Acreage				
Name	Type of Facility	Listing	Project Facility	Borough	Distance and Direction from Alaska LNG Project Area	Direction from Alaska	ugh Direction I from Alaska	ough Distance and Distance and Distance and Distance and Distance and Monace and Mo	n Milepost ska	Length (miles)	Affected	Description of Contamination
	i donity		. comy	Census Area		Begin	End		Construction			
Alaska DOT And PF - Tea Lake Outlet 4-2 Culvert Replacement	EPA Designated Site		Mainline		Within 0.25 mile of Corridor							
Alyeska - Pipeline Station 4	EPA Designated Site		Mainline		Within 0.25 mile of Corridor							
BP Exploration (Alaska) Inc. (BPXA) Northstar Caribou Crossing Compressor Facility	EPA Designated Site		Mainline		Within 0.25 mile of Corridor							
Chevron USA, Inc.	EPA Designated Site		Mainline		Within 0.25 mile of Corridor							
Grande Denali Lodge	EPA Designated Site		Mainline		Within 0.25 mile of Corridor							
Homer Electric Co. Kenai	EPA Designated Site		Mainline		Within 0.25 mile of Corridor							
MI Drilling Fluids	EPA Designated Site		Mainline		Within 0.25 mile of Corridor							
Nabors Drilling Rig	EPA Designated Site		Mainline		Within 0.25 mile of Corridor							
National Park Service	EPA Designated Site		Mainline		Within 0.25 mile of Corridor							
Nikiski Fuel, Inc Offshore Systems	EPA Designated Site		Mainline		Within 0.25 mile of Corridor							
Offshore Systems-Kenai	EPA Designated Site		Mainline		Within 0.25 mile of Corridor							

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TABLE 8.7-1										
Hazardous Waste Sites, Contamination, and Landfills within 0.25-Mile of the Alaska LNG Project ^a										
				Segment/	Distance and		Crossing	Acreage	Description of	
Name	Type of Facility	Listing	Project Facility	Borough or	Direction from Alaska	Direction from Alaska	Milepost	Length (miles)	Affected By	Contamination
			-	Area	Area	Begin	End		Construction	
Prospect Creek	EPA Designated Site		Mainline		Within 0.25 mile of Corridor					
PS #04, Taps Pump Station	EPA Designated Site		Mainline		Within 0.25 mile of Corridor					
Tesoro Alaska - Kenai Refinery	EPA Designated Site		Mainline		Within 0.25 mile of Corridor					
Trans Alaska Pipeline System Pump Station 4	EPA Designated Site		Mainline		Within 0.25 mile of Corridor					
BPX Drill Site 11 Well 30	Contaminated Site	Cleanup Complete - Institutional Controls	PTTL		Within Corridor					
BPXA - Liberty Mine Site	EPA Designated Site		PTTL		Within 0.25 Mile					
BPXA Endicott Production Facility, Liberty Development Project	EPA Designated Site		PTTL		Within 0.25 mile of Corridor					
BPXA Northstar Caribou Crossing Compressor Facility	EPA Designated Site		PTTL		Within 0.25 mile of Corridor					
Exxon Mobil Corporation - Duck Island Mine Site	EPA Designated Site		PTTL		Within 0.25 mile of Corridor					
Marsh Creek Camp 2 Waste Water Treatment Facility	EPA Designated Site		PTTL		Within 0.25 mile of Corridor					
Nabors McKinley Camp	EPA Designated Site		PTTL		Within 0.25 mile of Corridor					

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TABLE 8.7-1										
Hazardous Waste Sites, Contamination, and Landfills within 0.25-Mile of the Alaska LNG Project ^a										
				Segment/	Distance and		Crossing	Acreage	Description of	
Name	Type of Facility	Listing	Project Facility	Borough or	Direction from Alaska	Milepost	Length (miles)	Affected By	Contamination	
				Census Area	LNG Project Area	Begin	End		Construction	
BPX Drill Site 11 Well 30	Contaminated Site	Cleanup Complete - Institutional Controls	GTP		Within 0.25 mile of Facility					
BPXA - Liberty Mine Site	EPA Designated Site		GTP		Within 0.25 mile of Facility					
BPXA Endicott Production Facility, Liberty Development Project	EPA Designated Site		GTP		Within 0.25 mile of Facility					
BPXA Northstar Caribou Crossing Compressor Facility	EPA Designated Site		GTP		Within 0.25 mile of Facility					
Exxon Mobil Corporation - Duck Island Mine Site	EPA Designated Site		GTP		Within 0.25 mile of Facility					
Marsh Creek Camp 2 Waste Water Treatment Facility	EPA Designated Site		GTP		Within 0.25 mile of Facility					
Nabors McKinley Camp	EPA Designated Site		GTP		Within 0.25 mile of Facility					
Sources: USEPA, Envirofacts Geospatial Data	Website (http://w	ww.ena.dov/en	/iro/facts/data	downloads htr	al) Accessed Oct	ober 13 2014	1			

ADEC, Solid Waste Program, Website (www.dot.com) ADEC, Contaminated Sites Program, Website (<u>http://www.arcgis.com/home/item.html?id=315240bfbaf84aa0b8272ad1cef3cad3</u>) accessed October 13, 2014.

^aThese are based on publicly available records, however it is apparent there is duplication in the sites identification that needs to be verified with ADEC.





Contaminated Sites 35 70

Major Rivers

140 Miles

Solid Waste Sites

The information contained herein is for informational or planning purposes only. It does not nor should it be deemed to be an offer, request or proposals for rights or occupation of any ind. The Alaska ING Project Participants and their respective officers, employees and agents, make no warranty, implied or otherwise, nor accept any lability, as to the accuracy or completeness of the information contained in theore derumonic, durings on cohortonic files. Do extreme to the accuracy or completeness of the information contained in accuracy or completeness of the information contained in theory derumonic, durings on cohortonic files. Do extreme to the other information of the information contained in theory derumonic durings on the other information of the other theory derumonic during on the other information of the other theory derumonic during on the other theory derumonic during of the other theory during of the other theory derumonic during of the other theory during of the other theory derumonic during of the other the o these documents, drawings or electronic files. Do not remove or delete this note from document, drawing or electronic file. PREPARED BY: EXP ENERGY SERVICES INC. SCALE DATE:

1:6,000,00 2015-01-06 SHEET: 1 of 1 Sites are classified as:

- 1. Proposed Sites that are proposed (by the EPA, the state, or concerned citizen) for addition to the NPL due to contamination by hazardous waste and identified by the EPA as a candidate for cleanup because it poses a risk to human health and/or the environment (USDHHS, 2009);
- 2. Deleted Site deleted from the NPL by the EPA (with state concurrence) because site cleanup goals have been met and no further response is necessary at the site.

Currently, no sites in Alaska are proposed for NPL listing, while five sites are finalized and listed on the NPL. None of these finalized NPL sites are located within close proximity of the Project area. The closest of these sites is on Elmendorf Air Force Base in Anchorage, over 25 miles to the east of the preferred corridor (EPA, 2012).

Three sites in Alaska are deleted from the NPL, of which none are located within close proximity of the Project area. The closest deleted NPL site is Standard Steel and Metal Salvage Yard in Anchorage, approximately over 25 miles to the east of the preferred corridor.

8.7.2 Alaska Contaminated Sites Program

The ADEC Contaminated Sites Program (CSP) manages the cleanup of contaminated soil and groundwater in Alaska. All past and present contaminated sites, underground storage tanks, and Leaking Underground Storage Tanks (LUST) sites in the State of Alaska are listed and tracked through the ADEC Contaminated Sites Database (CSD) (ADEC, 2011a).

ADEC classifies its CSD sites into the following categories:

- 1. Cleanup Complete ADEC designates "Cleanup Complete" status when efforts to reduce hazardous substance contamination have achieved the most stringent levels established in state regulation, or the possibility of human exposure to any residual contamination is highly unlikely;
- 2. Cleanup Complete with Institutional Controls ADEC may allow hazardous substances to remain in the environment at a site if the contamination does not pose a risk to human health or the environment, but conditions or restrictions may be associated with the site that require compliance by current or future owners/operators. These conditions or restrictions require follow-up reporting; and
- 3. Open Ongoing activities to monitor, remediate, or assess site conditions (ADEC, 2011b).

Review of the ADEC CSD indicates that 16 sites are listed as cleanup complete, nine sites listed as cleanup complete with institutional controls, and 15 open sites located within the Project area. Within 0.25-mile of the Project area, there are an additional 16 sites listed as cleanup complete, four sites listed as cleanup complete with institutional controls, and 15 are listed as open sites.

8.7.3 Landfills

The ADEC SWIMS data indicate that four landfills are located within the Project area. All four have been listed as being retired (e.g., once complete final closure reports and records have been established).

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An additional five retired landfills, one active, and one planned landfill are located within 0.25-mile of the Project area.

8.8 DREDGED MATERIAL PLACEMENT AREAS

The proposed footprint of the Project facilities, including ancillary facilities will be identified during the Pre-FEED process. Information concerning the crossing of any dredge material placement areas will be presented in a subsequent draft of this Resource Report once further details are known. However at this time it is not anticipated that any existing dredge disposal areas will be crossed.

8.9 **RIGHTS-OF-WAY**

A desktop review was conducted for the Project of the available information regarding existing ROWs within the area of the Liquefaction Facility and Interdependent Facilities, which included a 2,000-foot wide corridor and the GTP (Appendix A). The actual footprint of the Project facilities, including ancillary facilities will be identified during the Pre-FEED process. Table 8.9-1 demonstrates how information concerning these areas will be presented in a subsequent draft of this Resource Report once further details are known.

In order to identify ROWs which will be intersected or paralleled by the Project, a review was conducted of the following data sources:

- Alaska Department of Transportation, Route Centerlines;
- U.S. Census Bureau's Master Address File / Topologically Integrated Geographic Encoding and Referencing Database, Alaska Roads;
- Alaska Department of Natural Resources, Information Resource Management Section, Alaska Railroads;
- Various Pipeline projects; and
- U.S. Army Corps of Engineers, Alaska District Navigable Waters Listing.

The Project area crosses or parallels numerous ROWs including railroads, utilities (including the TAPS), roads, and navigable waterways.

8.9.1 Roadways

8.9.1.1 Liquefaction Facility

The Liquefaction Facility area crosses 27 roads (Table 8.9-1), including minor private roads that may be converted to private access roads during LNG Facility operation. The LNG Facility area also crosses the Kenai Spur Highway, a major arterial roadway.

8.9.1.2 Interdependent Facilities

Pipelines and Related Aboveground Facilities

Mainline

The Mainline corridor intersects or parallels 46 roads, including four major highways:

- Dalton Highway;
- Elliot Highway;
- Parks Highway; and
- Kenai Spur Highway.

The Mainline is collocated (within 1-mile of and parallel to) several roadways for over 75 percent of the route, paralleling:

- The Dalton Highway from Deadhorse to Livengood, a distance of approximately 400 miles; and
- The Parks Highway from Nenana to south of Trapper Creek, a distance of approximately 235 miles.

At Livengood, the Mainline route will cross the Elliott Highway. Additional details concerning roadway crossings and co-location will be provided in a subsequent draft of this Resource Report as the route is further refined during the Pre-FEED process. In addition, details pertaining to roads used to access the area during construction and operation will be presented in a subsequent draft of this Resource Report once further details are known.

<u>PBTL</u>

The actual footprint of the PBTL will be identified during the Pre-FEED process. As facility sites are refined, roadway crossings and co-location will be identified and details pertaining to roads used to access the area during construction and operation will be presented in a subsequent draft of this Resource Report.

<u>PTTL</u>

The actual footprint of the PTTL will be identified during the Pre-FEED process. As facility sites are refined, roadway crossings and co-location will be identified and details pertaining to roads used to access the area during construction and operation will be presented in a subsequent draft of this Resource Report.

Aboveground and Ancillary Facilities

The locations of the aboveground (e.g., compressor stations, heater stations, meter stations, MLBVs) and ancillary facilities (e.g., construction camps, access roads, contractor yards) are not known at this time. As facility sites are refined in the Pre-FEED process, details pertaining to roads used to access the area during construction and operation will be presented in a subsequent draft of this Resource Report.

GTP

The actual footprint of the GTP, including ancillary facilities, will be identified during the Pre-FEED process. Details pertaining to road crossings, as well as roads used to access the area during construction and operation will be presented in a subsequent draft of this Resource Report.

8.9.2 Railroads

Only one railroad is located within the Project area, the Alaska Railroad (ARR) (Table 8.9-1). Railroad crossings will be constructed in accordance with Project-specific specifications, and the requirements of permits and approvals.

8.9.2.1 Liquefaction Facilities

No railroads are currently located within the area of the Liquefaction Facility.

8.9.2.2 Interdependent Facilities

Pipelines and Related Aboveground Facilities

Mainline

The Mainline generally parallels the ARR ROW near Chase south to Willow, near of Trapper Creek. In addition, the Mainline crosses or intersects the ARR ROW at six locations, of which two are anticipated to be avoided during route refinement. The remaining four crossing locations are located near:

- Healy;
- Summit;
- Broad Pass; and
- Kesugi Ridge.

Additional details concerning railroad crossings and co-location, as well as railroad access of the area during construction and operation will be provided in a subsequent draft of this Resource Report as the route is further refined.

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	TABLE 8.9-1																	
Rights-of-Way Within Alaska LNG Project Planning Area																		
Name	Type of Right-of- way	Primary Use	Project Facility	Segment/ Borough or Census Area	Milepost		Milepost		Milepost		Milepost		Milepost		Co-location With ¹ (miles)	Crossing Length (miles)	Acreage Affected By Construction	Crossing Method
	nay				Begin	End												
Aaron Avenue	Road		Liquefaction Facility	Kenai Peninsula Borough														
Alto Road	Road		Liquefaction Facility	Kenai Peninsula Borough														
Autumn Road	Road		Liquefaction Facility	Kenai Peninsula Borough														
Bernice Lake Road	Road		Liquefaction Facility	Kenai Peninsula Borough														
Cirrus Street	Road		Liquefaction Facility	Kenai Peninsula Borough														
Dale Court	Road		Liquefaction Facility	Kenai Peninsula Borough														
Forest Lane	Road		Liquefaction Facility	Kenai Peninsula Borough														
Gina Street	Road		Liquefaction Facility	Kenai Peninsula Borough														
Hinermann Road	Road		Liquefaction Facility	Kenai Peninsula Borough														
Industrial Avenue	Road		Liquefaction Facility	Kenai Peninsula Borough														
Jack Part Street	Road		Liquefaction Facility	Kenai Peninsula Borough														
Jody Street	Road		Liquefaction Facility	Kenai Peninsula Borough														
Josephine Way	Road		Liquefaction Facility	Kenai Peninsula Borough														
Joyce Circle	Road		Liquefaction Facility	Kenai Peninsula Borough														

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TABLE 8.9-1																																		
Rights-of-Way Within Alaska LNG Project Planning Area																																		
Name	Type of Right-of- way	Primary Use	Project Facility	Segment/ Borough or Census Area	Milepost		Milepost		Milepost		Milepost		Milepost		Milepost		Milepost		Milepost		Milepost		Milepost		Milepost		Milepost		Milepost		Co-location With ¹ (miles)	Crossing Length (miles)	Acreage Affected By Construction	Crossing Method
					Begin	End																												
Kenai Spur Highway	Road		Liquefaction Facility	Kenai Peninsula Borough																														
Lamar Avenue	Road		Liquefaction Facility	Kenai Peninsula Borough																														
N. Lovers Loop	Road		Liquefaction Facility	Kenai Peninsula Borough																														
N. Miller Loop Road	Road		Liquefaction Facility	Kenai Peninsula Borough																														
Nicholes Street	Road		Liquefaction Facility	Kenai Peninsula Borough																														
Ray Court	Road		Liquefaction Facility	Kenai Peninsula Borough																														
Rena Court	Road		Liquefaction Facility	Kenai Peninsula Borough																														
Robt Walker Avenue	Road		Liquefaction Facility	Kenai Peninsula Borough																														
Russ Court	Road		Liquefaction Facility	Kenai Peninsula Borough																														
Teppwood Court	Road		Liquefaction Facility	Kenai Peninsula Borough																														
Top Gun Street	Road		Liquefaction Facility	Kenai Peninsula Borough																														
Walker Street	Road		Liquefaction Facility	Kenai Peninsula Borough																														
Walter Street	Road		Liquefaction Facility	Kenai Peninsula Borough																														
Trans-Foreland Pipeline	Pipeline		Liquefaction Facility	Kenai Peninsula Borough																														

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TABLE 8.9-1 Pights-of-Way Within Alaska LNG Project Planning Area										
Name	Type of Right-of-	Primary Use	Project Facility	Segment/ Borough or Census Area	Milepost		Co-location With ¹ (miles)	Crossing Length (miles)	Acreage Affected By Construction	Crossing Method
	nay				Begin	End		(
Tyonek Onshore Pipeline	Pipeline		Liquefaction Facility	Kenai Peninsula Borough						
Cook Inlet	Waterway		Liquefaction Facility	Kenai Peninsula Borough						
Tikopia Street	Road		Mainline	Kenai Peninsula Borough						
Malaitna Avenue	Road		Mainline	Kenai Peninsula Borough						
Rig Tenders Road	Road		Mainline	Kenai Peninsula Borough						
Rig Tenders Dock Road	Road		Mainline	Kenai Peninsula Borough						
Tesoro Road	Road		Mainline	Kenai Peninsula Borough						
Hedburg Drive	Road		Mainline	Kenai Peninsula Borough						
Kenai Spur Road	Road		Mainline	Kenai Peninsula Borough						
Gray Avenue	Road		Mainline	Kenai Peninsula Borough						
Coringa Avenue	Road		Mainline	Kenai Peninsula Borough						
Beaver Avenue	Road		Mainline	Kenai Peninsula Borough						
Galen Avenue	Road		Mainline	Kenai Peninsula Borough						

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TABLE 8.9-1 Rights-of-Way Within Alaska LNG Project Planning Area										
Name	Type of Right-of-	/pe of Primary Project Facility Census Area Milepost		post	Co-location With ¹ (miles)	Crossing Length (miles)	Acreage Affected By Construction	Crossing Method		
	way				Begin	End		(11103)	Construction	
Wilma Drive	Road		Mainline	Kenai Peninsula Borough						
Blockade Glacier Road	Road		Mainline	Kenai Peninsula Borough						
Mount Torbert Road	Road		Mainline	Kenai Peninsula Borough						
Tordrillo Lane	Road		Mainline	Kenai Peninsula Borough						
Polar Way	Road		Mainline	Kenai Peninsula Borough						
Frost Street	Road		Mainline	Kenai Peninsula Borough						
Education Drive	Road		Mainline	Kenai Peninsula Borough						
Nikishka Beach Road	Road		Mainline	Kenai Peninsula Borough						
Wik Road	Road		Mainline	Kenai Peninsula Borough						
Rodney and Shelly Avenue	Road		Mainline	Kenai Peninsula Borough						
Foreland Circle	Road		Mainline	Kenai Peninsula Borough						
Shell Road	Road		Mainline	Kenai Peninsula Borough						
McLane Street	Road		Mainline	Kenai Peninsula Borough						

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TABLE 8.9-1 Rights-of-Way Within Alaska LNG Project Planning Area										
Name	Type of Right-of-	ype of Primary Project Facility Census Area		post	Co-location With ¹ (miles)	Crossing Length (miles)	Acreage Affected By Construction	Crossing Method		
	way				Begin	End		(innes)		
Viapan Highway	Road		Mainline	Kenai Peninsula Borough						
Beluga Highway	Road		Mainline	Kenai Peninsula Borough						
Charlie's Way	Road		Mainline	Kenai Peninsula Borough						
Karen Avenue	Road		Mainline	Kenai Peninsula Borough						
Sylvia Way	Road		Mainline	Kenai Peninsula Borough						
Traverse Avenue	Road		Mainline	Kenai Peninsula Borough						
Holley Beck Street	Road		Mainline	Kenai Peninsula Borough						
Bernice Lake Road	Road		Mainline	Kenai Peninsula Borough						
Ferry Road	Road		Mainline	Denali Borough						
Stamped Road	Road		Mainline	Denali Borough						
B-Street	Road		Mainline	Denali Borough						
Killian Street	Road		Mainline	Denali Borough						
Otto Lake Road	Road		Mainline	Denali Borough						

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TABLE 8.9-1										
Rights-of-Way Within Alaska LNG Project Planning Area										
Name	Type of Right-of- way	Type of Right-of- Use	Project Facility	Segment/ Borough or Census Area	Milepost		Co-location With ¹ (miles)	Crossing Length	Acreage Affected By Construction	Crossing Method
	way				Begin	End		(IIIIC3)		
Denali Highway	Road		Mainline	Denali Borough						
Old Parks Highway	Road		Mainline	Denali Borough						
Pr Drive	Road		Mainline	Denali Borough						
Summit	Road		Mainline	Denali Borough						
Old Denali Highway	Road		Mainline	Denali Borough						
Kenca Drive	Road		Mainline	Yukon-Koyukuk Census Area						
Parks Highway	Road		Mainline	Yukon-Koyukuk Census Area, Denali Borough & Matanuska- Susitna Borough						
Elliot Highway	Road		Mainline	Yukon-Koyukuk Census Area						
Dalton Highway	Road		Mainline	North Slope Borough & Yukon-Koyukuk Census Area						
Alaska Railroad	Railroad		Mainline	Yukon-Koyukuk Census Area, Denali Borough & Matanuska- Susitna Borough						
Enstar Pipeline	Pipeline		Mainline	Kenai Peninsula Borough						

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TABLE 8.9-1										
Rights-of-way within Alaska LNG Project Planning Area										
Name	Type of Right-of- way	Primary Use	Primary Use Project Facility	Segment/ Borough or Census Area	Milepost		Co-location With ¹ (miles)	Crossing Length (miles)	Acreage Affected By Construction	Crossing Method
					Begin	End		(
Furie Alaska Operating Pipeline	Pipeline		Mainline	Kenai Peninsula Borough						
Hilcorp Granite Point to Beluga Pipeline	Pipeline		Mainline	Kenai Peninsula Borough						
Trans-Foreland Pipeline	Pipeline		Mainline	Kenai Peninsula Borough						
Tyonek Onshore Pipeline	Pipeline		Mainline	Kenai Peninsula Borough						
Donlin Mine Natural Gas Pipeline	Pipeline		Mainline	Matanuska- Susitna Borough						
Alaska Stand Alone Pipeline (proposed)	Pipeline		Mainline	North Slope Borough, Yukon- Koyukuk Census Area, Denali Borough & Matanuska- Susitna Borough						
Trans-Alaska Pipeline	Pipeline		Mainline	North Slope Borough & Yukon-Koyukuk Census Area						
Cook Inlet	Waterway		Mainline	Kenai Peninsula Borough						
Susitna River	Waterway		Mainline	Matanuska- Susitna Borough						
Little Susitna River	Waterway		Mainline	Matanuska- Susitna Borough						
Yukon River	Waterway		Mainline	Yukon-Koyukuk Census Area						

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TABLE 8.9-1										
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					Begin	End		(innes)	Construction	
Tolovana River	Waterway		Mainline	Yukon-Koyukuk Census Area						
Chatanika River	Waterway		Mainline	Yukon-Koyukuk Census Area						
Tanana River	Waterway		Mainline	Yukon-Koyukuk Census Area						
Nenana River	Waterway		Mainline	Yukon-Koyukuk Census Area						
APSC Fuel Gas Line	Pipeline		Mainline	North Slope Borough						
Sagavanirktok River	Waterway		Mainline	North Slope Borough						
Kuparuk River	Waterway		Mainline	North Slope Borough						
Source: ¹ Within a 1-mile c	distance of the ex	kisting ROW								

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PBTL

The actual footprint of the PBTL will be identified during the Pre-FEED process. As facility sites are refined, railroad crossings and co-location will be identified and details pertaining to railroad access of the area during construction and operation will be presented in a subsequent draft of this Resource Report.

<u>PTTL</u>

The actual footprint of the PTTL will be identified during the Pre-FEED process. As facility sites are refined, railroad crossings and co-location will be identified and details pertaining to railroad access of the area during construction and operation will be presented in a subsequent draft of this Resource Report.

Aboveground and Ancillary Facilities

The locations of the aboveground (e.g., compressor stations, heater stations, meter stations, MLBVs) and ancillary facilities (e.g., construction camps, access roads, contractor yards) are not known at this time. As facility sites are identified in the Pre-FEED process, details pertaining to railroad crossing and access during construction and operation will be presented in a subsequent draft of this Resource Report.

GTP

No railroads are currently located within the area of the GTP. As facility sites are refined, railroad crossings and co-location will be identified and details pertaining to railroad access of the area during construction and operation will be presented in a subsequent draft of this Resource Report.

8.9.3 Pipelines

The Project area includes several existing and proposed pipelines (Table 8.9-1), including the following:

- APSC Fuel Gas Line;
- Badami pipeline;
- Point Thomson Export Pipeline (liquid line);
- TAPS;
- Enstar Beluga Pipeline;
- Hilcorp Granite Point to Beluga;
- NorthStar Gas Pipeline;
- Tesoro Nikiski Pipeline;
- Tyonek-Onshore Pipeline;
- Proposed Alaska Stand Alone Project (ASAP);

- Proposed Donlin Mine Natural Gas Pipeline;
- Proposed Furie Alaska Operation Pipeline; and
- Proposed Trans-Foreland Pipeline.

The Applicants will work closely with the Alaska Joint Pipeline Office (JPO) and the owners of existing and proposed pipelines to develop site-specific plans for any crossings.

8.9.3.1 Liquefaction Facilities

The Tyonek-Onshore Pipeline and proposed Trans-Foreland Pipeline are located within the area of the Liquefaction Facility. The proposed footprint of the Liquefaction Facility, including ancillary facilities, will be identified during the Pre-FEED process, including the potential crossing or rerouting of these pipelines.

8.9.3.2 Interdependent Facilities

Pipelines and Related Aboveground Facilities

Mainline

The Mainline is collocated with pipelines for over 50 percent of the route, paralleling:

- TAPS from Deadhorse to Livengood, a distance of approximately 400 miles; and
- APSC Fuel Gas Line from Deadhorse to the Brooks Range, a distance of approximately 150 miles.

In addition, the Mainline generally follows the proposed ASAP from Deadhorse to Trapper Creek. The Mainline will also crosses several pipelines including:

- Tesoro Nikiski Pipeline;
- Enstar Beluga Pipeline;
- Hilcorp Granite Point to Beluga;
- Proposed Furie Alaska Operation Pipeline;
- Proposed Donlin Mine Natural Gas Pipeline; and
- Proposed Trans-Foreland Pipeline.

Additional details concerning pipeline crossings and collocation will be provided in a subsequent draft of this Resource Report as the route is further refined in the Pre-FEED process.

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<u>PBTL</u>

The actual footprint of the PBTL will be identified during the Pre-FEED process. As facility sites are refined, railroad crossings and co-location will be identified and details pertaining to pipeline crossings and co-location will be presented in a subsequent draft of this Resource Report.

<u>PTTL</u>

The actual footprint of the PTTL will be identified during the Pre-FEED process. Current design includes partial co-location of the PTTL with the existing Badami pipeline. As facility sites are refined in the Pre-FEED process, pipeline crossings and co-location will be identified and presented in a subsequent draft of this Resource Report.

Aboveground and Ancillary Facilities

The locations of the aboveground (e.g., compressor stations, heater stations, meter stations, MLBVs) and ancillary facilities (e.g., construction camps, access roads, contractor yards) are not known at this time. As facility sites are identified in the Pre-FEED process, details pertaining to pipeline crossings will be presented in a subsequent draft of this Resource Report.

GTP

The actual footprint of the GTP, and ancillary facilities, will be identified during the Pre-FEED process, including the potential crossing of any pipelines.

8.9.4 Utilities

As indicated in Table 8.9-1, the Project area crosses both known buried and overhead utilities. The existing utilities within the Project area will be further identified during preconstruction surveys.

8.9.4.1 Liquefaction Facility

The Liquefaction Facility crosses both buried and overhead utilities. The existing utilities within the Project area will be further identified during preconstruction surveys.

8.9.4.2 Interdependent Facilities

Pipelines and Related Aboveground Facilities

Mainline

Five power line crossings have been identified along the Mainline corridor. Additional details concerning utility crossings and co-location will be provided in a subsequent draft of this Resource Report as the route is further refined during the Pre-FEED process.

<u>PBTL</u>

The actual footprint of the PBTL will be identified during the Pre-FEED process. As facility sites are refined, utility crossings and co-location will be identified and presented in a subsequent draft of this Resource Report.

PTTL

The PTTL crosses an existing power line in two locations near the GTP. The actual footprint of the PTTL will be identified during the Pre-FEED process. As facility sites are identified, utility crossings and colocation will be identified and presented in a subsequent draft of this Resource Report.

Aboveground and Ancillary Facilities

The locations of the aboveground (e.g., compressor stations, heater stations, meter stations, MLBVs) and ancillary facilities (e.g., construction camps, access roads, contractor yards) are not known at this time. As facility sites are identified in the Pre-FEED process, details pertaining to utility crossings will be presented in a subsequent draft of this Resource Report.

GTP

Power lines have not been identified in the area of the GTP based on the current data available. As the Project's facility sites are identified, utility crossings and collocation opportunities will be identified for the GTP, and presented in a subsequent draft of this Resource Report.

8.9.5 Waterways

Waterways are navigable waters that provide a channel for commerce and transportation of people and goods. Nine navigable freshwater waterways, as determined by the USACE, are located in the Project area (Table 8.9-1). In addition to these freshwater waterways, the Project area also includes the Cook Inlet and Prudhoe Bay. BLM jurisdiction of waterways is determined through research conducted by BLM and the State.

8.9.5.1 Liquefaction Facility

The Liquefaction Facility will be constructed on the eastern shore of Cook Inlet in the Nikiski area of the Kenai Peninsula. As part of the Liquefaction Facility, the Marine Terminal will be operated and maintained in accordance with a WSA and USCG Letter of Recommendation. The Project started the WSA process with the USCG and will advance a follow-on WSA to accompany the FERC application. The proposed footprint of the Liquefaction Facility, including ancillary facilities, will be identified during the Pre-FEED process. Detail pertaining to waterways (navigation channels) used to access the area during construction and operation will be presented in a subsequent draft of this Resource Report once further details are known.

8.9.5.2 Interdependent Facilities

Pipelines and Related Aboveground Facilities

Mainline

Details concerning waterway crossings will be provided in a subsequent draft of this Resource Report as the route is further refined during the Pre-FEED process. In addition, details pertaining to waterways used to access the area during construction and operation will also be presented.

PBTL

The actual footprint of the PBTL will be identified during the Pre-FEED process. As facility sites are identified, waterway crossings and waterways used to access the area during construction and operation will be presented in a subsequent draft of this Resource Report.

<u>PTTL</u>

The actual footprint of the PTTL will be identified during the Pre-FEED process. As facility sites are identified, waterway crossings and waterways used to access the area during construction and operation will be presented in a subsequent draft of this Resource Report.

Aboveground and Ancillary Facilities

The locations of the aboveground (e.g., compressor stations, heater stations, meter stations, MLBVs) and ancillary facilities (e.g., construction camps, access roads, contractor yards) are not known at this time. As facility sites are identified during the Pre-FEED process, details pertaining to waterways used to access the area during construction and operation will be presented in a subsequent draft of this Resource Report.

GTP

The GTP will include improvements to the existing PBU West Dock loading/unloading facilities located on the coast of the Beaufort Sea. Improvements will include dredging to facilitate delivery of modules by vessels during sealift events. The footprint of the GTP, and ancillary facilities, will be further refined during the Pre-FEED process. Details pertaining to waterways (navigation channels) used to access the area during construction and operation will be presented in a subsequent draft of this Resource Report.

8.10 STATE OF ALASKA'S COASTAL ZONE

In 2011, the State of Alaska's coastal zone management program expired (Federal Register, 2011). Therefore, the Coastal Zone Management Act is not applicable to the Project at this time.

8.11 POTENTIAL CONSTRUCTION IMPACTS AND MITIGATION MEASURES

Land use and recreational considerations for potential impacts related to construction will depend on the timing and location of construction activities and may include the following:

- Temporary loss of land use types;
- Anticipated recovery time for land use types post-construction;
- Potential conflicts with current land use plans and regulations;
- Proximity to residential and commercial areas;
- Crossing of ROWs (e.g., navigable waterways, roads); and
- Potential disrupted or restricted access to recreational areas.

Mitigation of potential land use and recreational impacts during Project construction will involve optimizing Project collocation with existing infrastructure as much as is practicable. Any additional mitigation measures will be developed in consultation with agencies and communities as the Project moves toward refinement of the overall footprint during the Pre-FEED process.

A general summary of potential impacts to land use and recreation from construction of this Project is provided in Appendix D. This Appendix also includes a summary of the types of plans, as examples, that can be developed to address potential impacts identified during Pre-FEED. A subsequent draft of this Resource Report will identify potential site-specific impacts to land use and recreational areas crossed, or in the vicinity of, the (1) Liquefaction Facilities and (2) Interdependent facilities and the associated mitigation measures proposed to minimize those impacts.

8.12 POTENTIAL OPERATIONAL IMPACTS AND MITIGATION MEASURES

Land use and recreational considerations for operation-related impacts could include:

- Permanent conversion of land use (i.e., facility footprints);
- Restrictions to current land use;
- Proximity to residential and commercial areas; and
- Restricted access to previous recreational areas.

A general summary of potential impacts to land use and recreation from Project operations is provided in Appendix D. This Appendix also includes a summary of the types of plans, as examples, that can be developed to address potential impacts identified during Pre-FEED. As additional Project details become available, a subsequent draft of this Resource Report will identify potential site-specific impacts to land use and recreational areas crossed, or in the vicinity of the (1) Liquefaction Facilities and (2) Interdependent facilities and a discussion of the associated mitigation measures proposed to minimize those impacts.

8.13 VISUAL RESOURCES

8.13.1 Existing Visual Environment

The Project area spans over approximately 800 miles with a view shed that includes Cook Inlet, river valleys bordered by steep mountain passes, rolling hills, evergreen and hardwood forest, non-contiguous permafrost, flat tundra, the PBU, Prudhoe Bay, and ROWs (e.g., TAPS). A desktop review was conducted for the Project to identify special land uses or locations of scenic value within 25 miles of the Liquefaction Facility and Interdependent Facilities. This distance was selected based on BLM visual assessment and curvature of the earth. The proposed footprint of the Project facilities, including ancillary facilities, will be further refined during the Pre-FEED process. Table 8.13.1-1 demonstrates how information concerning these areas will be presented in a subsequent draft of this Resource Report once further details are known.

TABLE 8.13.1-1						
Potential Special Land Uses with Scenic Value and Sensitive Visual Resource Areas within 25 miles of the Alaska LNG Project						
Special Land Use or Sensitive Visual Resource Area	Description	Segment/Borough or Census Area	Project Facility	Milepost	Distance and Direction from Construction Work Area (feet)	Distance and Direction from Permanent Footprint (feet)
Kenai National Wildlife Refuge	National Wildlife Refuge	Kenai Peninsula Borough	Liquefaction Facility, Mainline	To Be Determined	To Be Determined	To Be Determined
East Foreland Lighthouse Reserve	Park	Kenai Peninsula Borough	Liquefaction Facility	To Be Determined	To Be Determined	To Be Determined
Parks Highway	Scenic Byway	Denali Borough	Mainline	To Be Determined	To Be Determined	To Be Determined
Denali National Park	National Park and Preserve	Denali Borough	Mainline	To Be Determined	To Be Determined	To Be Determined
Gates of the Arctic National Park	National Park	North Slope, Northwest Arctic Borough	Mainline	To Be Determined	To Be Determined	To Be Determined
Yukon Flats National Wildlife Refuge	National Wildlife Refuge	Yukon-Koyukuk Census Area	Mainline	To Be Determined	To Be Determined	To Be Determined
Kanuti National Wildlife Refuge	National Wildlife Refuge	Yukon-Koyukuk Census Area	Mainline	To Be Determined	To Be Determined	To Be Determined
Minto Flats State Game Refuge	State Game Refuge	Yukon-Koyukuk Census Area	Mainline	To Be Determined	To Be Determined	To Be Determined
Susitna State Recreational River	Recreation Area	Matanuska-Susitna Borough	Mainline	To Be Determined	To Be Determined	To Be Determined
Willow Creek State Recreation area	Recreation Area	Matanuska-Susitna Borough	Mainline	To Be Determined	To Be Determined	To Be Determined

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TABLE 8.13.1-1 Potential Special Land Uses with Scenic Value and Sensitive Visual Resource Areas within 25 miles of the Alaska LNG Project						
Special Land Use or Sensitive Visual Resource Area	Description	Segment/Borough or Census Area	Project Facility	Milepost	Distance and Direction from Construction Work Area (feet)	Distance and Direction from Permanent Footprint (feet)
Denali State Park.	State Park	Denali Borough	Mainline	To Be Determined	To Be Determined	To Be Determined
Dalton Highway Scenic Byway	Scenic Byway	North Slope Borough	Mainline, GTP	To Be Determined	To Be Determined	To Be Determined
Arctic National Wildlife Refuge	National Wildlife Refuge	North Slope Borough	Mainline, GTP (PTTL)	To Be Determined	To Be Determined	To Be Determined

The degree of visual impact that may result from a Project is determined by considering the general character of the existing landscape and the visually prominent features of the proposed facilities. Several federal agencies have developed methodologies for assessing visual impacts. The BLM Visual Resource Management Methodology (VRM) will serve as a guideline for this study since (1) the BLM manages the largest amount of federal land in the Project area and (2) has an established visual resource management methodology. A draft visual aesthetics work plan is provided in Appendix B and will be discussed further with FERC and BLM in 2015 such that a final work plan will be included in a subsequent Resource Report.

To the extent practicable, the Project features will be located in areas (collocated) with existing infrastructure (i.e., TAPS, Dalton Highway) to minimize adverse visual effects.

8.13.1.1 Liquefaction Facility

The Liquefaction Facility will be a constructed on the eastern shore of Cook Inlet in the Nikiski area of the Kenai Peninsula. The areas adjacent to the Cook Inlet, including the Nikiski area, are industrialized with existing infrastructure related to marine transport and oil and gas processing. Views of Mount Redoubt and other mountains in the Aleutian Range are present to the west across Cook Inlet. To the east, the Kenai Mountains are visible. Identified areas with sensitive resources within 25 miles of the Liquefaction Facility include:

- Residential areas in Nikiski;
- Views from the water in the Cook Inlet;
- Kenai National Wildlife Refuge; and
- East Foreland Lighthouse Reserve.

The actual footprint of the Liquefaction Facility, including ancillary facilities, will be identified during the Pre-FEED process. Detail pertaining to changes to the visual character of the area during construction and operation will be presented in a subsequent draft of this Resource Report.

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Pipelines and Related Aboveground Facilities

Mainline

The Mainline corridor will cross a variety of landscapes, including the following:

- Arctic Coastal Plain;
- Brooks and Alaska mountain ranges;
- Tanana Flats;
- Nenana River Valley; and •
- Susitna River Valley.

A variety of landcover and vegetation types comprise the landscape, including boreal forest, wetlands, waterways, dwarf scrub/shrub vegetation, and tundra. The following is a description of the Mainline corridor from north to south.

The northern portion of the Mainline parallels the Dalton Highway, north of Livengood. The Dalton Highway begins a few miles from Prudhoe Bay and ends approximately 414 miles to the south at Elliot Highway. Constructed in 1974 for the Alyeska Pipeline Service Company, the Dalton Highway's original name was the Haul Road and was used to support pipeline construction and provide access as part of the TAPS. Utilized by an estimated 20,000 to 25,000 recreational visitors annually, the Dalton Highway traverses a diversity of landscapes and provides views of numerous significant natural features; the following depictions are adapted from the Dalton Highway Scenic Byway Corridor Partnership Plan (ADNR, 2010):

- Arctic Coastal Plain (Deadhorse to Last Chance Wayside) – Permafrost seals the ground and creates ice features including layers of ice (aufeis), ice-wedge polygons up to 100 feet in diameter, ice-core mounds (palsas), and conical ice-cored hills (pingos) up to 1,450 feet wide and 230 feet high. The landscape also includes vast wetlands and thaw lakes. The copper-colored Franklin Bluffs can be seen in the northern reach of this section. Buildings and oilfield infrastructure are also visible at the northern end at Prudhoe Bay.
- North Slope (Last Chance Wayside to Galbraith Lake) The remote North Slope is a treeless • coastal plain characterized by a vast expanse of low-lying tundra plants. Key natural features in this section are the Sagavanirktok River and Slope Mountain (located at the southern edge of the North Slope). Visible to the south are the mountains of the Brooks Range.
- Brooks Range (Galbraith Lake to Coldfoot) The landscape in this section of the Mainline corridor along the Dalton Highway is dominated by mountain peaks and river valleys. The Gates of the Arctic NPP and the Arctic NWR are visible from the Dalton Highway. Natural features in this section include Sukakpak Mountain (a recognizable marble rock peak in the Brooks Range),

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Atigun Pass (elevation 4,739 feet, where the Dalton Highway crosses the Great Continental Divide), Atigun River Valley, and Galbraith Lake.

• Boreal Forest (Coldfoot to Livengood) – This section of the Mainline corridor along the Dalton Highway proceeds through the hills and valley bottoms of the Yukon-Tanana uplands. Vegetation includes spruce and birch forests, bogs, and creeks, as well as signs of wildfire. This section of the Mainline corridor includes a crossing of the Yukon River, views of Yukon Flats NWR, the Arctic Circle, Kanuti NWR, Finger Mountain (rock pinnacles rising straight from the tundra), and Grayling Lake (glacially carved). Two small communities, Coldfoot and Wiseman, are located along this section of the Dalton Highway, with residential and commercial structures providing a visual contrast to the undeveloped surroundings.

South of Livengood, the Project area contains minor travel routes and follows the Tolovana River through the Tanana Lowlands, an alluvial plain that slopes gently upwards to Alaska Range. In this portion of the Project area, the permafrost is discontinuous and the predominate vegetation consists of boreal forests with numerous species, including black spruce, white spruce, balsam poplar, white birch, and trembling aspen. This section of the Mainline corridor also includes a crossing of the Tanana River, where the corridor begins to parallel the Parks Highway. Here, the environment is developed with visual contrast created by buildings, paved highways, and other infrastructure through Nenana and Healy, as well as other populated, but incorporated, areas adjacent to the Parks Highway. In these populated areas, the landscape adjacent to the proposed route includes existing linear utility and road corridors.

Between Fairbanks and Nenana, the Mainline corridor parallels the Alaska Railroad passing through rolling hills or domes covered by dwarf scrub vegetation and open spruce stands. Developed features include a freight and passenger railroad and several roads. The Nenana River is visible to the west and the Alaska Range is a prominent feature within the viewshed. The landscape of the Alaska Range that is visible in this portion of the Project area includes predominately rocky slopes, ices fields, and glaciers.

South of Cantwell, significant features in the landscape include Broad Pass, with views of nearby valleys, Byers Lake, and the Alaska Range peaks. Significant features to the south include the Middle Fork of Chulitna River and the Denali State Park. From Denali State Park, the summit of Mount McKinley can be viewed on a clear day. As the Mainline corridor nears Denali National Park and the town of Cantwell, the landscape of the Alaska Range is visible with rock slopes, ice fields, and glaciers without vegetation. Areas with no vegetation and dwarf scrub communities are common.

Along the southern portion of the Mainline corridor, the landscape is relatively flat compared to the rest of the route, with vegetation dominated by spruce and hardwood forests. Natural features present include the Talkeetna Range to the east and numerous lakes, including Nancy Lake, Rock Lake, Big Lake North and Big Lake South. Settlements include Trapper Creek and Willow. Along the Susitna and Little Susitna river valleys, the Mainline corridor passes to the west of Anchorage before reaching Cook Inlet,

In summary, areas with sensitive visual resources within 25 miles of the Project area along the Mainline corridor include:

- Arctic NWR;
- Dalton Highway Scenic Byway;

- Denali NPP;
- Denali State Park;
- Gates of the Arctic National Park;
- George Parks Highway Scenic Byway;
- Iditarod National Historic Trail;
- Minto Flats State Game Refuge;
- Susitna SRR;
- Willow Creek SRA; and
- Yukon Flats NWR.

Additional details concerning the viewshed along the Mainline corridor will be provided in a subsequent draft of this Resource Report as the route is further refined during the Pre-FEED process.

<u>PBTL</u>

The actual footprint of the PBTL will be identified during the Pre-FEED process. The facilities will be constructed in a developed area within the PBU. Oil pipelines and gravel pads dominate the visual landscape. The surrounding terrain is generally flat with micro habitat relief and covered with snow throughout much of the year. Sensitive visual resources within 25 miles of the pipeline include the Dalton Highway Scenic Byway and Arctic NWR.

<u>PTTL</u>

The actual footprint of the PTTL will be identified during the Pre-FEED process. The facilities will be constructed in a developed area. The surrounding terrain is generally flat with micro habitat relief and covered with snow throughout much of the year. As facility sites are refined, details pertaining to any changes to the visual character of the area during construction and operation will be presented in a subsequent draft of this Resource Report.

Aboveground and Ancillary Facilities

The locations of the aboveground (e.g., compressor stations, heater stations, meter stations, MLBVs) and ancillary facilities (i.e., construction camps, access roads, contractor yards) are not known at this time. As facility sites are refined in the Pre-FEED process, details pertaining to characteristics of the viewshed during construction and operation will be presented in a subsequent draft of this Resource Report.

GTP

The GTP will be constructed in the Prudhoe Bay area near the Beaufort Sea coast. Oil pipelines and gravel pads dominate the visual landscape. The surrounding terrain is generally flat with micro habitat

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relief and covered with snow throughout much of the year. Sensitive visual resources within 25 miles of the GTP facilities include the Dalton Highway Scenic Byway and Arctic NWR.

The proposed footprint of the GTP, including ancillary facilities, will be identified during the Pre-FEED process. The viewshed will essentially be the same as it is now, as the GTP will be within an existing unit, with infrastructure surrounding it. Additional details pertaining to any changes to the visual character of the area during construction and operation will be presented in a subsequent draft of this Resource Report once further details are known.

8.13.2 Federal, State, and Local Visual Resources Management Objectives

Federal and state agency management plans include guidelines and objectives for managing visual resources.

8.13.2.1 Bureau of Land Management

The Federal Land Policy and Management Act of 1976 mandates that the BLM manage its scenic resources to protect visual quality for present and future generations. Proposed activities that require modification of the landscape must make a reasonable attempt to minimize impacts to visual resources. BLM uses the VRM methodology to identify and evaluate scenic resources under its jurisdiction and to establish management objectives for those resources (BLM, 1980). Resources are assigned a classification based on scenic quality, viewer sensitivity to visual change, and viewing distance (BLM, 1984). The BLM's VRM Manual defines the following classifications and their management objectives:

- Class I Objective The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention;
- Class II Objective The objective of this class is to retain the existing character of the landscape. The level of the change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape;
- Class III Objective The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape; and
- Class IV Objective The objective of this class is to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of the viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic elements of the characteristic landscape.

The majority of the lands in the Project area do not have an established VRM Class rating. Summarized below are the VRM guidelines for the BLM lands in the Project area as described in the applicable BLM RMPs.

Arctic Field Office and Central Yukon Field Office

In 1991 BLM issued a Record of Decision on the Utility Corridor RMP/EIS (BLM, 1991d). The Utility Corridor was established in 1971 by Public Land Order 5150 and is dedicated to long-term utility and transportation needs. According to the RMP/EIS, the inner corridor lands are to be managed according to Class IV VRM objectives. This RMP also identified the following resource RMAs:

- The Dalton Highway RMA is classified as VRM IV; sightseeing is considered a primary recreational use related to visual resources; and
- The Dalton Corridor RMA, which generally corresponds to the remainder of the Utility Corridor, is classified as VRM Class III.

Eastern Interior Field Office

Central Yukon RMP

Currently, the Yukon Central RMP provides for management of 9.5 million acres in west-central Alaska (BLM, 1986a). BLM is currently developing an RMP for the Eastern Interior Planning Area to replace the White Mountain National Recreation Area RMP (1986), Steese National Conservation Area RMP (1986), and Fortymile Management Framework Plan RMP (1980). These existing RMPS specify that visual resources will be managed where practicable to retain the existing character of the landscape but no VRM inventory has been conducted in this planning area.

East Alaska RMP

The BLM established VRM inventory classes in the East Alaska planning area in 2003. This land is managed to protect and enhance vegetative communities, fish and wildlife resources, recreational opportunities and natural, cultural and geological resources under the East Alaska RMP/Final EIS (BLM, 2006). The majority of lands in the project planning area are primarily classified as Class IV although small portions are classified as Class III.

Anchorage District Office

Iditarod National Historic Trail Comprehensive Management Plan included the identification of scenic quality classes for portions of the trail based upon the Natural and Scenic Resources Inventory conducted in 1982 (BLM 1986b; BLM 2008). This inventory identified resources in the plan areas with scenic quality ratings. The recommendations of the Inventory included developing a management plan for each of these areas.

Denali National Park and Preserve

The Consolidated General Management Plan for Denali NPP guides the management of the park and preserve. The plan stipulates that visitor centers and other facilities will reflect the wild setting and

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minimize visual impacts to park visitors by considering scale, materials, color, texture, and continuity with the existing visual environment. The plan notes that incompatible uses in the National Park include surface disturbing activities that "unduly change the visual character of the park and preserve" (NPS, 2011).

National Scenic Byways Program

Established by Congress in 1991, the National Scenic Byways Program designates roads with distinctive natural, scenic, historic, cultural, archaeological, or recreational qualities unique to their regions. The program does not provide management guidance but its mission is, "to provide resources to the byway community in creating a unique travel experience and enhanced local quality of life through efforts to preserve, protect, interpret, and promote the intrinsic qualities of designated byways" (USDOT, 2011).

8.13.2.2 State Agencies

The State of Alaska Scenic Byways Program recognizes routes that provide access to significant scenic, cultural, and recreational resources. Scenic Byways in the Project area include the Dalton Highway and the Parks Highway. In an effort to promote certain features, including scenic viewpoints, Comprehensive Conservation Plans (CCPs) have been developed for the Dalton and the Parks Highways (ADNR, 2008; ADNR, 2010). However, these plans do not provide regulations for the viewshed, or guidance for the use of areas along the byways for pipelines or other infrastructure.

8.13.2.3 Local Government

An outline of local government guidelines and objectives for managing visual resources includes:

- Kenai Peninsula Borough The Kenai Peninsula Borough Comprehensive Plan notes among its key issues the importance of visual impacts as "unattractive uses, such as certain junkyards, gravel pits and storage areas adjacent to highways and residential areas can affect land values and tourism," but does not contain guidance related to management of sensitive visual resources (Kenai, 2005);
- Matanuska-Susitna Borough The Borough-wide comprehensive plan for the Matanuska-Susitna Borough does not address management of sensitive visual resources (MSB, 2005);
- Denali Borough The Comprehensive Plan for the Denali Borough does not address visual resources (DB, 2009);
- Fairbanks North Star Borough The Fairbanks North Star Borough Comprehensive Plan does not provide specific restrictions on visual sensitive areas, but adopts the following principles for industrial development: "buffering to minimize adverse impacts on surrounding land use" and ensuring "the use is compatible with surrounding development and uses, and is sensitive to natural systems in the area" (FNSB, 2005); and
- NSB The North Slope Borough Comprehensive Plan is currently under revision and does not contain guidance related to management of sensitive visual resources (NSB, 2014).

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8.13.3 Key Visual Components of the Alaska LNG Project

8.13.3.1 Liquefaction Facility

The Liquefaction Facility includes the LNG Plant with storage and process facilities and the Marine Terminal with trestles, piping, and berthing facilities. The preliminary design calls for three 160,000 m³ LNG storage tanks. Other prominent features proposed for the Liquefaction Facility include a dry flare, a wet flare, a low pressure flare, and elevated telecommunications equipment. Other prominent features proposed for the Marine Terminal include two loading berths, two LNG trestles, cryogenic pipelines from the LNG tanks to the loading berths and vapor return lines, material offloading facility, and a tug and support vessel dock. More information on the size and design for the tanks and other features such as aircraft and marine navigation lighting will be provided as the design is finalized as part of the Pre-FEED process. Based upon the information currently available, these features are similar in scale to the other features in the surrounding area.

8.13.3.2 Interdependent Facilities

Pipelines and Related Aboveground Facilities

Mainline

The majority of the Mainline will be buried during operation. Prominent features will be limited to temporary pipeline construction activities and permanent pipeline markers. The majority of the Mainline will be located within an existing utility corridor and based upon the information currently available, the Mainline will be similar in scale to the other features in the surrounding area.

<u>PBTL</u>

The preliminary design specifies that the approximate one-mile PBTL will be aboveground on vertical support members. Based upon the information currently available, these features will be similar in scale to the other features in the surrounding area.

<u>PTTL</u>

A portion of the PTTL will generally follow an existing pipeline based upon the information currently available. Pre-FEED studies will determine whether the PTTL should be an elevated or buried pipeline. Details pertaining to visual resources in the area surrounding the PTTL will be presented in a subsequent draft of this Resource Report.

Aboveground and Ancillary Facilities

The locations of the aboveground (e.g., compressor stations, heater stations, meter stations, MLBVs) and ancillary facilities (e.g., construction camps, access roads, contractor yards) are not known at this time. As facility sites are identified in the Pre-FEED process, details pertaining to visual resources in the area will be presented in a subsequent draft of this Resource Report, once further details are known.

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GTP

Prominent features proposed for the GTP include three parallel treatment trains and improvements to the west loading dock. More information on the size and design of the GTP features will be determined as the design is finalized as part of the Pre-FEED process. Based upon the information currently available, these features will be similar in scale to the other features in the surrounding area.

8.13.4 Key Observation Points

The proposed footprint of the Project facilities, including ancillary facilities will be identified during the Pre-FEED process. As details are refined, key observation points (KOPs) will be identified. Table 8.13.4-1 demonstrates how information concerning these areas will be presented in a subsequent draft of this Resource Report.

TABLE 8.13.4-1				
Potential locations of KOPs for the Project				
Special Land Use or Sensitive Visual Resource Area	Description	Segment/Borough or Census Area	Project Facility	Milepost

8.13.4.1 Liquefaction Facility

KOPs for the Liquefaction Facility will include locations within the Kenai National Wildlife Refuge (KNWR). The final number and location of the KOPs will be developed in consultation with USFWS but will likely include the Refuge Headquarters. Current views from each KOP will be photographed and a simulation of the Project facilities in both winter and summer conditions will be developed.

8.13.4.2 Interdependent Facilities

Pipelines and Related Aboveground Facilities

<u>Mainline</u>

Although the majority of the Mainline will be located belowground, the vegetative clearing for the ROW may be visible in areas with sensitive visual resources or transportation corridors used by motorists or other sensitive viewers. Visual impacts to KOPs will be reduced by generally following the Mainline. The location of KOPS will be determined in consultation with the NPS, BLM, USFS, and the ADNR and will likely include summer and winter views from the Denali National Park Visitor Center and from the Parks Highway to the north of the Nenana River crossing.

<u>PBTL</u>

The PBTL will be sited within an area of extensive industrial development, the KOPs for the facilities will be from the Dalton Highway at Deadhorse. In addition, the original Prudhoe Bay discovery well (ARCO No. 1) is located immediately adjacent to the proposed GTP site. This well location is a national historic site and the ability to view the site from the CGF pad or West Dock access road must be

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maintained. The viewpoint will include a view of the pipeline for recreationist and motorists from the Dalton Highway. The final number and location of the KOPs will be developed in consultation with ADNR and ADOT&PF. A photograph of the current conditions along with a simulation of the viewpoint in both winter and summer conditions will be presented in a subsequent draft of this Resource Report once further details are known.

<u>PTTL</u>

As the majority of the PTTL footprint is situated within an area with extensive industrial development, the KOPs for this pipeline facility will likely be from the Dalton Highway at Deadhorse. The viewpoint will include a view of the facilities for recreationist and motorists from the Dalton Highway. The final number and location of the KOPs will be developed in consultation with ADNR and ADOT&PF.

Aboveground and Ancillary Facilities

The locations of the aboveground (e.g., compressor stations, heater stations, meter stations, MLBVs) and ancillary facilities (e.g., construction camps, access roads, contractor yards) are not known at this time. As facility sites are identified in the Pre-FEED process, details pertaining to KOPs will be presented in a subsequent draft of this Resource Report once further details are known.

GTP

As the GTP will be sited within an area of extensive industrial development, the KOPs for the GTP facilities will be from the Dalton Highway at Deadhorse. In addition, the original Prudhoe Bay discovery well (ARCO No. 1) is located immediately adjacent to the proposed GTP site. The viewpoint will include a view of the GTP facilities for recreationist and motorists from the Dalton Highway. The final number and location of the KOPs will be developed in consultation with ADNR and ADOT&PF. A photograph of the current conditions along with a simulation of the viewpoint in both winter and summer conditions will be presented in a subsequent draft of this Resource Report once further details are known.

8.14 POTENTIAL CONSTRUCTION IMPACTS AND MITIGATION MEASURES

Impacts to visual resources will be analyzed by means including the BLM's VRM methodology, which is based upon the level of contrast of the Project from the existing conditions and the sensitivity of the existing view. Visual resource considerations for impacts related to Project construction will generally include the temporary use and presence of equipment and workers in the Project area. Mitigation of potential visual resource impacts generally involves maximizing Project collocation with existing infrastructure and locating non-essential features (e.g., storage areas, work camps) away from KOPs.

A general summary of potential impacts visual resources from construction of this Project is provided in Appendix D. This Appendix also includes a summary of the types of plans, as examples, that can be developed to address potential impacts. As additional Project details become available, a subsequent draft of this Resource Report will identify potential site-specific impacts to visual resources crossed, or in the vicinity of, the (1) Liquefaction Facilities and (2) Interdependent facilities and the associated mitigation measures proposed to minimize the identified impacts.

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8.15 POTENTIAL OPERATIONAL IMPACTS AND MITIGATION MEASURES

Visual resource considerations for impacts related to Project operation generally include the presence of permanent structures or permanent vegetation clearing. A general summary of potential impacts visual resources from operation of this Project is provided in Appendix D. This Appendix also includes a summary of the types of plans, as examples, that can be developed to address potential impacts. As additional Project details become available, a subsequent draft of this Resource Report will identify sitespecific impacts to visual resources crossed, or in the vicinity of, the (1) Liquefaction Facilities and (2) Interdependent Facilities and the associated mitigation measures proposed to minimize the identified impacts.

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APPENDIX A MAPPING DEPICTING LAND OWNERSHIP

PROVIDED UNDER SEPARATE COVER

APPENDIX B ALASKA LNG VISUAL RESOURCES STUDY PLAN

Alaska LNG

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ACRONYMS AND ABBREVIATIONS

ABBREVIATION	DEFINITION
Abbreviations for Units	of Measurement
°C	degrees Celsius
°F	degrees Fahrenheit
BSCF/D	billion standard cubic feet per day
cfs	cubic feet per second
cm	centimeters
dB	decibels
dBA	A-weighted decibels
ft	feet
g	grams
gpm	gallons per minute
ha	hectare
hp	horsepower
Hz	hertz
in	inches
kg	kilogram
kHz	kilohertz
kW	kilowatts
L _{dn}	day-night sound level
L _{eq}	equivalent sound level
L _{max}	maximum sound level
m ³	cubic meters
Ма	mega-annum (millions of years)
mg	milligrams
mg/L	milligrams per liter
mg/m ³	milligrams per cubic meter
MGD	million gallons per day
mm	millimeters
MMBtu/hr	million British thermal units per hour
MMSCF/D	million standard cubic feet per day
MPH	miles per hour
MMTA	million metric tons per annum
ng	nanograms
ppb	parts per billion
ppbv	parts per billion by volume
ppm	parts per million
ppmv	parts per million by volume
Psig	pounds per square inch gauge
rms	root mean square
SPL	sound pressure level
tpy	tons per year
μg	microgram

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ABBREVIATION	DEFINITION
APSC	Alyeska Pipeline Service Company
AQRV	Air Quality Related Value
Arctic NWR	Arctic National Wildlife Refuge
ARD	acid rock drainage
ARDF	Alaska Resource Data File
ARPA	Archaeological Resources Protection Act of 1979
ARRC	Alaska Railroad Corporation
AS	Alaska Statute
ASAP	Alaska Stand Alone Pipeline
ASME	American Society of Mechanical Engineers
ASOS	Automated Surface Observation System
ASRC	Arctic Slope Regional Corporation
ATC	Allakaket Tribal Council
ATWS	additional temporary workspace
AWOS	Automated Weather Observing System
B.C.	British Columbia
BACT	Best Available Control Technology
BGEPA	Bald and Golden Eagle Protection Act
BIA	U.S. Department of the Interior, Bureau of Indian Affairs
BLM	U.S. Department of the Interior, Bureau of Land Management
BMP	best management practices
BOD ₅	biochemical oxygen demand
BOEM	U.S. Department of the Interior, Bureau of Ocean Energy Management
BOG	boil-off gas
BP	Before Present
C.F.R.	Code of Federal Regulations
CAA	Clean Air Act
САМА	Central Arctic Management Area
CCP	Comprehensive Conservation Plans
CDP	Census Designated Place
CEA	Chugach Electric Association
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CGF	Central Gas Facility
CGP	Construction General Permit
CH ₄	methane
CHA	Critical Habitat Area
CIRCAC	Cook Inlet Regional Citizens Advisory Council
CIRI	Cook Inlet Region Inc.
CLG	Certified Local Government
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	total greenhouse gas emissions, in CO2-equivalent global warming potential
COC	Certificate of Compliance
CONUS	Continental U.S.

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ABBREVIATION	DEFINITION
COOP	National Weather Service, Cooperative Observer Program
CPCN	Certificate of Public Convenience and Necessity
CRA	Certificate of Reasonable Assurance
CSD	Contaminated Sites Database
CSP	Contaminated Sites Program
CSU	conservation system units
CV	coefficient of variation
CWA	Clean Water Act
DB	Denali Borough
DEM	Digital Elevation Model
DGGS	ADNR Division of Geological and Geophysical Surveys
DH	dock head
DHSS	Alaska Department of Health and Social Services
DMLW	Alaska Department of Natural Resources, Division of Mining, Land, and Water
DPS	Distinct Population Segment
DWPP	Drinking Water Protection Program
EDA	U.S. Department of Commerce, Economic Development Administration
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPRP	Emergency Preparedness and Response Plan
ERL	Environmental, Regulatory and Lands
ERMA	Extended Recreation Management Areas
ESA	Endangered Species Act
ESD	Emergency Shut Down
ESU	Evolutionary Significant Unit
FAA	U.S. Department of Transportation, Federal Aviation Administration
FCC	Federal Communications Commission
FE	U.S. Department of Energy, Office of Fossil Energy
FEED	front-end engineering design
FEIS	Final Environmental Impact Statement
FEMA	U.S. Department of Homeland Security, Federal Emergency Management Agency
FERC	U.S. Department of Energy, Federal Energy Regulatory Commission
FERC Plan	FERC Erosion Control, Revegetation, and Maintenance Plan
FERC Procedures	FERC Wetland and Waterbody Construction and Mitigation Procedures
FLPMA	Federal Land Policy and Management Act (of 1976) BLM
FMP	Fisheries Management Plan
FNSB	Fairbanks North Star Borough
FR	Federal Regulation
GDP	Gross Domestic Product
GHG	greenhouse gases
GIS	geographic information system
GMU	Game Management Units

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ABBREVIATION	DEFINITION
GP	General Permit
GRI	Gas Research Institute
GTP	gas treatment plant
GWP	Global Warming Potential
H ₂ S	hydrogen sulfide
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
НАР	Hazardous Air Pollutant
НАРС	Habitat Areas of Particular Concern
НСА	High Consequence Area
HDD	horizontal directional drill
HDMS	Hazard Detection and Mitigation System
HGM	hydrogeomorphic
HLV	heavy lift vessel
HMR	Hazardous Materials Regulations
HRS	Hazard Ranking System
IBA	Important Bird Areas
ICS	Incident Command System
IHA	Incidental Harassment Authorization
IHLC	Inupiat History, Language, and Culture
ILI	In-line Inspection
IMP	Integrity Management Plan
IP	Individual Permit
ISO	International Organization for Standardization
JPO	State and Federal Joint Pipeline Office
kbpd	thousand barrels per day
КСС	Kuparuk Construction Camp
КОР	key observation points
КРВ	Kenai Peninsula Borough
KTC	Kuparuk Transportation Company
LiDAR	light detection and ranging
Liquefaction Facility	natural gas liquefaction
LLC	Limited Liability Company
LNG	liquefied natural gas
LNGC	liquefied natural gas carrier
LOA	Letter of Authorization
LOD	Limits of Distribution
LP	Limited Partnership
LPG	liquefied petroleum gas
LUP	Land Use Permit
LUST	Leaking Underground Storage Tanks
MACT	maximum achievable control technology
Mainline	An approximately 800-mile-long, large-diameter gas pipeline
MAOP	maximum allowable operating pressure
MARPOL	Marine Pollution Protocol

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ABBREVIATION	DEFINITION
MBTA	Migratory Bird Treaty Act
MCD	marine construction dock
MHHW	mean higher high water
MHW	mean high water
ML&P	Anchorage Municipal Light and Power
MLA	Mineral Leasing Act
MLBV	Mainline block valve
MLLW	mean lower low water
MLW	mean low water
MMPA	Marine Mammal Protection Act
MMS	Mainline Meter Station
MOE	margin of error
MOF	material offloading facility
MP	Mainline milepost
MPRSA	Marine Protection Research and Sanctuaries Act of 1972
MSB	Matanuska-Susitna Borough
MSCFD	Thousand standard cubic feet per day
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAS	nonindigenous aquatic species
NCC	national certification corporation
NCDC	National Climatic Data Center
NDE	non-destructive examination
NEP	non-essential experimental population
NEPA	National Environmental Policy Act
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NFIP	National Flood Insurance Program
NGA	Natural Gas Act
NHPA	National Historic Preservation Act of 1996, as amended
NID	Negligible Impact Determination
NLURA	Northern Land Use Research Alaska, LLC
NMFS	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NO ₂	nitrogen dioxide
NO _X	nitrogen oxides
NOAA	National Oceanographic and Atmospheric Administration
NOI	Notice of Intent
North Slope	Alaska North Slope
NPDES	National Pollutant Discharge Elimination Systems
NPL	National Priority List
NPP	National Park and Preserve
NPR-A	National Petroleum Reserve – Alaska
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	Noise-Sensitive Areas

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ABBREVIATION	DEFINITION
NSB	North Slope Borough
NSPS	New Source Performance Standards
NTC	national training center
NTP	Notice to Proceed
NVIC	Navigation and Vessel Inspection Circular
NWA	Northwest Alaska Pipeline
NWI	National Wetland Inventory
NWR	National Wildlife Refuge
O ₃	Ozone
OC	open-cut
OCS	Outer Continental Shelf
OD	outside diameter
OEP	FERC, Office of Energy Projects
OHA	ADNR Division of Parks and Outdoor Recreation, Office of History and Archaeology
ONA	Outstanding Natural Area
OPMP	ADNR, Office of Project Management and Permitting
OU	Operating unit
PAC	potentially affected community
Pb	the element lead
PBTL	Prudhoe Bay Gas Transmission Line
PBU	Prudhoe Bay Unit
PCB	polychlorinated biphenyl
PHMSA	Pipeline and Hazardous Materials Safety Administration
PM _{2.5}	particulate matter having an aerodynamic diameter of 2.5 microns or less
PM ₁₀	particulate matter having an aerodynamic diameter of 10 microns or less
PMP	Point Thomson Gas Transmission Line milepost
POC	Plan of Cooperation
POD	Plan of Development
Project	Alaska LNG Project
PRPA	Paleontological Resources Preservation Act
PSD	Prevention of Significant Deterioration
PTTL	Point Thomson Gas Transmission Line
PTU	Point Thomson Unit
PWS	public water supply
Q&A	question and answer
RCA	Regulatory Commission of Alaska
RCRA	Resource Conservation and Recovery Act
RNA	Research Natural Area
ROD	Record of Decision
ROE	right-of-entry
ROW	right-of-way
RR	Resource Report
SCC	Deadhorse Airport
SDWA	Safe Drinking Water Act
SEIS	Supplemental Environmental Impact Statement

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ABBREVIATION	DEFINITION
SGR	State Game Refuge
SHPO	State Historic Preservation Office(r)
SIP	State Implementation Plan
SMA	Special Management Areas
SRMA	Special Recreation Management Areas
SO ₂	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure Plan
SPCO	State Pipeline Coordinator's Office
SPLASH	Structure of Populations, Levels of Abundance, and Status of Humpbacks
SPMT	self-propelled module transporters
SRA	State Recreation Area
SRR	State Recreation River
STATSGO	State Soil Geographic
STATSGO2	State Soil Geographic2 – General Soils Map of Alaska & Soils Data (2011)
SWAPA	Southwest Alaska Pilots Association
SWPPP	Stormwater Pollution Prevention Plan
ТАНС	total aliphatic hydrocarbons
TAPS	Trans-Alaska Pipeline System
TBD	To be determined
TCC	Tanana Chiefs Conference
The Applicants' Plan	Applicants' Upland Erosion Control, Revegetation, and Maintenance Plan
The Applicants' Procedures	Applicants' Wetland and Waterbody Construction, and Mitigation Procedures
ТРАН	total polycyclic aromatic hydrocarbons
TSA	Transportation Security Administration
TSCA	Toxic Substances Control Act
TSD	tug support dock
TSS	total suspended solids
UCIDA	United Cook Inlet Drift Association
UIC	Underground Injection Control
U.S.	United States
U.S.C.	U.S. Code
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USDHHS	U.S. Department of Health and Human Services
USDOE	U.S. Department of Energy
USDOI	U.S. Department of the Interior
USDOT	U.S. Department of Transportation
USDW	underground sources of drinking water
USFS	U.S. Department of Agriculture, Forest Service
USFWS	U.S. Department of the Interior, Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
VPSO	Village Public Safety Officer

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ABBREVIATION	DEFINITION
VRM	Visual Resource Management Methodology
VSM	Vertical Support Members
WELTS	Well Log Tracking System
WRCC	Western Regional Climate Center
WSA	Waterway Suitability Assessment
WSR	Wild and Scenic Rivers

1.0 INTRODUCTION

This study plan identifies the objectives and methods to be implemented to identify visually sensitive resources and the potential impacts to those resources from the Alaska LNG project within the Project Planning Area¹.

2.0 STUDY DESCRIPTION AND OBJECTIVES

The goal of this study is to describe existing aesthetic and visual conditions in the Project Planning Area in designated visually sensitive areas and develop information to support the application.

The study has two principal objectives:

- Document the existing aesthetic and visual character in designated visually sensitive areas, designated viewsheds, and wilderness areas within the viewing horizon of the Project Planning Area.
- Evaluate the visual and aesthetic impacts of Project features and operations within the context of the local landscape character and consistency with applicable land management planning goals for aesthetic and visual resources.

3.0 **RESOURCE MANAGEMENT GOALS**

This section describes resource management goals of the agencies with jurisdiction over aesthetic and visual resources in the Project Planning Area.

3.1 FEDERAL VISUAL RESOURCES MANAGEMENT OBJECTIVES

3.1.1 U.S. Bureau of Land Management

The Federal Land Policy and Management Act of 1976 mandates that the BLM manage its scenic resources to protect visual quality for present and future generation. Proposed activities that require modification of the landscape must make a reasonable attempt to minimize impacts to visual resources. BLM uses the VRM methodology to identify and evaluate scenic resources under its jurisdiction and to establish management objectives for those resources. ² Resources are assigned a classification based on scenic quality, viewer sensitivity to visual change, and viewing distance.³ The BLM's VRM Manual defines the following classifications and their management objectives.

¹ The term "Project Planning Area" is defined to include the GTP site, the eventual route and workspace for project pipelines, and the area where the Liquefaction Facility would be constructed. Within the pipeline study corridor, a preliminary route is being identified during Pre-FEED. The footprint areas for project facilities including ancillary facilities, and land requirements for construction and operation are also being identified during the Pre-FEED process.

² U.S. Bureau of Land Management, BLM VRM Manual H-8400, Visual Resource Management, (Washington, DC: U.S. Bureau of Land Management. 1980).

³ U.S. Bureau of Land Management, BLM Handbook H-8410-1, Visual Resource Inventory (Washington, DC: U.S. Bureau of Land Management, 1984).

- <u>Class I Objective</u> -The objective of this class is to preserve the existing character of the landscape. The class provides for natural ecological changes; however, it does not preclude limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- <u>Class II Objective</u> The objective of this class is to retain the existing character of the landscape. The level of the change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- <u>Class III Objective</u> -The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- <u>Class IV Objective</u> The objective of this class is to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of the viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic elements of the characteristic landscape.

The majority of the lands in the proposed Project area do not have an established VRM Class rating. Summarized below are the VRM guidelines for the BLM lands in the proposed Project area as described in the applicable BLM Resource Management Plan (RMP).

3.1.2 Arctic Field Office and Central Yukon Field Office

Utility Corridor RMP: In 1991 BLM issued a Record of Decision on the Utility Corridor Resource Management Plan/ Environmental Impact Statement. ⁴ The Utility Corridor was established in 1971 by Public Land Order 5150 and is dedicated to long-term utility and transportation needs. According to the RMP/EIS the inner corridor lands are to be managed according to Class IV VRM objectives. This RMP also identified the following resource RMA's:

- The Dalton Highway RMA is classified as VRM IV; sightseeing is considered a primary recreational use related to visual resources: and
- The Dalton Corridor RMA, which generally corresponds to the remainder of the Utility Corridor, is classified as VRM Class III.

However, this RMP is under revision and will actually be removed and replaced with a new Yukon Central RMP under development and proposed for release in 2017.

⁴ U.S. Bureau of Land Management Utility Corridor Resource Management Plan/Environmental Impact Statement. (U.S. Bureau of Land Management (BLM). 1991).

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3.1.3 Eastern Interior Field Office

Central Yukon RMP: Currently, the Yukon Central RMP provides for management of 9.5 million acres in west-central Alaska.⁵ BLM is currently developing an RMP for the Eastern Interior Planning Area to replace the White Mountain National Recreation Area RMP (1986), Steese National Conservation Area RMP (1986) and Fortymile Management Framework Plan RMP (1980. These existing RMPS specify that visual resources will be managed where practicable to retain the existing character of the landscape but no VRM inventory has been conducted in this planning area.

East Alaska RMP: The BLM established VRM inventory classes in the East Alaska planning area in 2003. This land is managed to protect and enhance vegetative communities, fish and wildlife resource, recreation opportunities and natural, cultural and geological resources under the East Alaska RMP/Final EIS (BLM 2006).⁶ The proposed Project would overlap with the East Alaska RMP planning area minimally. The majority of lands in the Project Planning Area are primarily classified as Class IV although small portions are classified as Class III.

Denali National Park and Preserve: The Consolidated General Management Plan for Denali National Park and Preserve (NPP) guides the management of the park and preserve. The plan stipulates that visitor centers and other facilities will reflect the wild setting and minimize visual impacts to park visitors by considering scale, materials, color, texture, and continuity with the existing visual environment. The plan notes that incompatible uses in the National Park include surface disturbing activities that "unduly change the visual character of the park and preserve".⁷

National Scenic Byways Program: Established by Congress in 1991, the National Scenic Byways Program designates roads with distinctive natural, scenic, historic, cultural, archaeological, or recreational qualities unique to their regions. The program does not provide management guidance but its mission is, "to provide resources to the byway community in creating a unique travel experience and enhanced local quality of life through efforts to preserve, protect, interpret, and promote the intrinsic qualities of designated byways". ⁸ The George Parks Highway, also known as the Parks Highway, connects Anchorage and Fairbanks providing panoramic views of the Alaska Range and Mount McKinley along this 323 mile National Scenic Byway.State of Alaska

3.1.4 Alaska Scenic Byways

The State of Alaska Scenic Byways Program recognizes routes that provide access to significant scenic, cultural and recreational resources. Scenic Byways in the Project Planning Area include the Dalton

upload/ GMP%20Consolidated%20Final.pdf) accessed October 4, 2014.

⁵ U.S. Bureau of Land Management, Central Yukon Planning Area. Record of Decision, http://archive.org/stream/recordofdecision_3/recordofdecision_3_djvu.txt, Website Accessed October 4, 2014.

⁶ U.S. Bureau of Land Management, East Alaska Resource Management Plan/Final Environmental Impact Statement, Volume 1. Prepared by the Glennallen Field Office, June 2006.

⁷ National Park Service, Consolidated General Management Plan for Denali National Park and Preserve, Amended, (National Park Service 2011), Website (http://www.nps.gov/dena/parkmgmt/

⁸ Federal Highway Administration, National Scenic Byways Program, (Federal Highway Administration (FHWA), United States Department of Transportation. 2011), Website: (http://www.fhwa.dot.gov/byways/about) accessed October 4, 2014.

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Highway and the Parks Highway. In an effort to promote certain features, including scenic viewpoints, Comprehensive Conservation Plans (CCPs) have been developed for the Dalton⁹ and the Parks Highways¹⁰. However, these plans do not provide regulations for the viewshed or guidance for the use of areas along the byways for pipelines or other infrastructure.

3.2 LOCAL GOVERNMENT

North Slope Borough -The North Slope Borough Comprehensive Plan is currently under revision and does not currently contain guidance related to management of sensitive visual resources.¹¹

Kenai Peninsula Borough- The Kenai Peninsula Borough Comprehensive Plan notes among its key issues the importance of visual impacts as "unattractive uses, such as certain junkyards, gravel pits and storage areas adjacent to highways and residential areas can affect land values and tourism" but does not contain guidance related to management of sensitive visual resources.¹²

Matanuska-Susitna Borough -The Borough wide comprehensive plan for the Matanuska-Susitna Borough does not address management of sensitive visual resources.¹³

Denali Borough – The Comprehensive Plan for the Denali Borough does not address visual resources.¹⁴

Iditarod Historic Trail Alliance- The Iditarod Historic Trail Alliance does not address visual resources but is actively involved as a stakeholder with the Alaska SHPO on projects that may impact the Iditarod Trail.

Fairbanks North Star Borough – The Comprehensive Plan for the Fairbanks North Star Borough does not provide specific restrictions on visual sensitive areas but adopts the following principles for industrial development–" buffering to minimize adverse impacts on surrounding land use" and ensuring "the use is compatible with surrounding development and uses, and is sensitive to natural systems in the area".¹⁵ If the pipeline route crosses into the FNSB, then an evaluation of the potential impacts to the land uses in the borough will be evaluated.

⁹ Alaska Department of Natural Resources (ADNR), Dalton Highway Scenic Byway Corridor Partnership Plan, Prepared for Alaska Department of Transportation and Public Facilities, State Scenic Byways Program, Website

^{: (}http://www.dot.state.ak.us/stwdplng/scenic/daltoncpp/DaltonHighwayScenicBywayCorridorPartnershipPlan_FINAL.pdf), accessed October 4, 2014.

¹⁰ Alaska Department of Natural Resources, George Parks Highway Scenic Byway Corridor Partnership Plan, Prepared for Alaska Department of Transportation and Public Facilities, State Scenic Byways Program. Website: (http://dnr.alaska.gov/parks/interp/pdf/georgeparkshwyscenicbyway.pdf), accessed October 4, 2014 and

¹¹ North Slope Borough. Department of Planning & Community Services. Comprehensive Plan, Website, http://www.north-slope.org/your-government/comprehensive-plan accessed October 4, 2014.

¹² Kenai Peninsula Bureau. Planning Department. Comprehensive Plan June 2005, Website http://www2.borough.kenai.ak.us/planningdept/plan/2005/plan.htm accessed October 4, 2014.

¹³ Matanuska-Susitna Borough Comprehensive Development Plan. 2005, Website, http://www.matsugov.us/component/docman/cat_view/156-plans/157-comprehensiveplans?Itemid=238 accessed October 4, 2014

I4Denali
 Borough.
 Comprehensive
 Plan
 2009,
 Website,
 http://www.denaliborough.govoffice.com/index.asp?SEC=B965F92F-F014-4BC3-8310-8445438750AB&DE=8B35EEA5-40FC-4E5E-B812-D7C332892D37&Type=B_BASIC
 accessed October 4, 2014

¹⁵ Fairbanks North Star Borough. Comprehensive Plan 2005, Website http://co.fairbanks.ak.us/communityplanning/ accessed October 4, 2014

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4.0 EXISTING INFORMATION

The pipeline and related above ground facilities will cross a variety of landscapes, including the Arctic Coastal Plain, the Brooks and Alaska mountain ranges, the Tanana Flats, the Nenana River Valley, and the Susitna River Valley. A variety of land cover and vegetation types comprise the landscape including tundra, wetlands, waterways, dwarf scrub/shrub vegetation, and boreal forest.

Areas with sensitive visual resources in the Project Planning Area include a number of travel routes, recreation areas, and populated areas. Denali National Park, Gates of the Arctic National Park, the Arctic National Wildlife Refuge, the Yukon Flats National Wildlife Refuge, and the Kanuti National Wildlife Refuge are also located within 25 miles of the Project Planning Area. Other sensitive resources include the Minto Flats State Game Refuge, Susitna State Recreational River, Willow Creek State Recreation area, and Denali State Park. The Project Planning Area includes two designated scenic byways: the state and federally-designated George Parks Highway Scenic Byway (also known as the Parks Highway), the state-designated Dalton Highway Scenic Byway, and the Iditarod National Historic Trail.

5.0 STUDY AREA

An approximately 2,000 feet wide study corridor has been identified for the Mainline and PTTL. Preliminary studies have identified areas with sensitive visual resources within 25 miles of the Project Planning Area. The final study area for visual and aesthetic resources will be defined through consultation with agencies.

6.0 METHODS

This section outlines the tasks and methods required for the visual resources study. The following tasks would be required to complete the visual resources study:

- Desk top analysis/background research;
- Agency consultation;
- Field studies;
- Visual simulation development; and
- Resource report preparation.

6.1 DESKTOP ANALYSIS

A desktop analysis of resources in the Project Planning Area for inclusion in RR8 will be conducted by the Project. The desktop analysis will consist of two phases. The first phase will identify sensitive locations in the Project Planning Area by comparing project documentation and site maps with information on publically accessible areas and identified scenic resources. These areas and resources include: parks, roadways, scenic overlooks, schools, and historic sites within 25 miles of the Project Planning Area. Data will be gathered from public GIS and other data sources. Table 1 presents the

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locations currently identified with areas that would warrant further study to determine the presence of sensitive visual resources in the Project Planning Area.

	Table 1					
Special Land Use or Sensitive Visual Resource Area	Description	Segment/Borough or Census Area	Project Facility			
Parks Highway	Scenic Byway	Denali	Mainline			
Dalton Highway Scenic Byway	Scenic Byway	North Slope	Mainline, GTP			
Denali National Park	National Park and Preserve	Denali	Mainline			
Gates of the Arctic National Park	National Park	North Slope, Northwest Arctic Borough	Mainline			
Arctic National Wildlife Refuge	National Wildlife Refuge	North Slope	Mainline, GTP (PTTL)			
Yukon Flats National Wildlife Refuge	National Wildlife Refuge	Yukon-Koyukuk	Mainline			
Kanuti National Wildlife Refuge	National Wildlife Refuge	Yukon-Koyukuk	Mainline			
Minto Flats State Game Refuge	State Game Refuge	Yukon-Koyukuk	Mainline			
Susitna State Recreational River	Recreation Area	Matanuska-Susitna Borough	Mainline			
Willow Creek State Recreation area	Recreation Area	Matanuska-Susitna Borough	Mainline			
Iditarod National Historic Trail	National Historic Trail/Recreation Area	Matanuska-Susitna Borough	Mainline			
Denali State Park.	State Park	Denali	Mainline			
Kenai National Wildlife Refuge	National Wildlife Refuge	Liquefaction Facilities				
East Foreland Lighthouse Reserve	Park	Kenai Peninsula Borough	Liquefaction Facilities			

The second phase of the desktop analysis will consist of a review of project components to identify locations where visually prominent features will be constructed or more visually intrusive construction methodologies employed. This phase of analysis will identify preliminary areas with key observation points (KOPs) based upon the presence of sensitive resources and the proposed features/construction methods. KOPs are generally selected for one or two reasons: 1) the location provides representative views of the landscape along a specific route segment or in a general region of interest or high recreational use; and/or 2) the viewpoint effectively captures the presence or absence of a potentially adverse impact in that location form the proposed project. A viewshed analysis from the preliminary KOP viewpoints will be conducted on a Digital Elevation Model (DEM) representative of three time periods of project development (existing conditions, post-construction and post- reclamation). The specific time frame for the post-reclamation simulations will be defined during consultation.

6.1.1 Deliverables

The results of the desktop analysis will be summarized by the Project in a memorandum that will be distributed to the consulting agencies. The memorandum will provide descriptions of the locations of areas with potential KOPS, any identified visual resource management objectives for that area, and the

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responsible land managing agency. A map will be provided showing the locations of the potential viewpoints. The information will also be incorporated into RR8.

6.2 CONSULTATION

After the desktop analysis is complete, the Project will consult with federal and state agencies with management responsibilities for areas with visually sensitive resources. Potential consultation will be conducted with the National Park Service (NPS), Bureau of Land Management (BLM), United States Fish and Wildlife Service (FWS), Alaska Department of Natural Resources (DNR), and the Alaska State Historic Preservation Office (SHPO), depending on the lands impacted. The consultation will consist of four phases. The first phase of the consultation process will define the study area for visual resources. The next phase will confirm the location of areas with KOPs identified during the desktop analysis and identify any additional areas that the agencies recommends as a KOP. Following completion of the field study, photographs and information regarding the surveyed areas will be presented to the consulting agencies. During this portion of the consultation, the specific viewpoints will be selected for which visual simulations will be prepared. During the final phase of consultation, the visual simulations will be presented to the agencies and tribal entities for review and selection of final KOPs/Simulations to be included in RR8.

6.2.1 Deliverables

- Packets with agendas, maps, photographs, and other review materials will be provided for each meeting.
- Meeting summaries will be distributed to all consulting agencies after each meeting.

6.3 FIELD STUDIES

Visual resource specialists with expertise in the BLM Visual Resource Management System (VRM) will visit the areas with potential KOPs. The specialists will capture GPS coordinates using a Trimble GEO series GPS and site photographs using a digital camera. The photographs will be representative of critical locations where built elements of the proposed project would be visible.

During the field studies, the specialists will conduct a visual resources inventory using the BLM's VRM system. The inventory will include a scenic quality evaluation and a sensitivity level analysis for each KOP. If a VRM Management class has not been assigned to the location of the KOP, a classification will be developed as part of the inventory.

6.3.1 Assumptions:

- A minimum of 20 KOP viewpoints will be visited.
- All baseline photographs will be taken with a lens that is comparable to the human eye.
- Several photographs may be taken in the vicinity of each KOP to facilitate selection of the most critical views.

- All photographs will be obtained from public land.
- In order to obtain representative views for winter and summer conditions, an initial field survey will be conducted in the summer with a follow-up visit in the winter.

6.3.2 Deliverables

- Photographs of each viewpoint.
- Photo log of all photographs taken.
- Scenic quality field inventory forms, quality rating forms, and sensitivity rating sheets for each KOP not previously inventoried.
- Maps and/or KMZ layers showing the location and direction of each viewpoint.

6.4 VISUAL SIMULATIONS

After the list of KOPs is approved by the agencies, 3D models will be created in CADD and Autodesk 3dsMax Design 3D for each location. Visual simulations will be created using the 3D model and Adobe Photoshop to show the existing and proposed conditions. The post construction views will include simulations in both winter and summer conditions of post-construction and post-reclamation views. Additional simulations will be prepared showing the appearance from an aerial view of the liquefaction facilities, GTP, and a representative compressor and heating station.

6.4.1 Deliverables:

- Visual simulations for 10 selected KOP viewpoints (5 simulations at each KOP simulating existing conditions, post-construction and post reclamation during both winter and summer) for a total of 50 simulations.
- 4 additional simulations/renderings of the aerial views of the liquefaction facility, the GTP, and a compressor and heating station.

6.5 IMPACT ANALYSIS

The proposed action simulations will be compared to baseline photographs to determine impact for each KOP. The impact levels will be assigned based upon the level of contrast from the existing conditions and the identified VRM classification objectives using the contrast rating process defined in the BLM VRM.

6.5.1 Deliverables

- Visual contrast sheets will be developed for each KOP.
- The impacts levels and simulations will be incorporated into RR8.

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APPENDIX C CONTAMINATED SITES MAPBOOK

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APPENDIX D GENERAL IMPACTS FROM SIMILAR PROJECTS IN ALASKA

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	Project Activity												
Potential Impact	Grading, Clearing, Excavating (incl. Blasting), Trench, Pipelay, Backfill, Reclamation	Water Crossings (Pipelines & Bridges)	lce Roads & Pads	Erosion Control & Drainage Control	Water Withdrawal & Usage	Water Discharge	Solid Waste Storage & Disposal	General Infrastructure Activities	Facility Construction	Facility Operations	Offshore Construction	Resource Report No.	*Potential Plans to Address Impacts
Air Emissions (including dust) from Construction	x	х	x	х	Х	х	Х	X	Х		x	1, 9	C, J, O, T, W
Air Emissions from Operations										Х		9	J, W, LL
Surface Water Quality Impacts (Increased Turbidity [TSS] / Sedimentation in Surface Water)	x	x	x	x	x	x	x	x	x	x	x	2, 3, 7	G, H, J, T, V, Y, II, KK
Contamination Migration	x	Х				Х	Х	Х		Х		1, 2, 3, 7	G, I, GG
Disruption / Loss of Wildlife, Fish or Marine Mammal Habitat	x	x	x	x	x	x		x	x	x	x	2, 3	A, B, C, G, H, K, N, R, V, DD, EE, JJ
Disturbance & Vessel Strikes from Vessel Traffic								X		х	x	3	B, N
Disturbance of Known Historic Archaeological or Architectural) and Paleontological Resources	x	x	x					x	x		x	1, 4, 6, 7	C, D, E, Z, AA
Erosion	x	Х		х		х			Х		X	1, 2, 6, 7, 8	G, H, II, KK
Groundwater Impacts (Withdrawal, Drawdown, Vertical & Horizontal Hydraulic connectivity, Wells)	x	x	x		x				x	x		1, 2	Ү, ММ
Hazards to Aviation								х	Х	Х		1, 11	м
Hazards to Marine Navigation		Х						х			X	1, 11	B, M
Inadvertent HDD Mud Release		Х										1, 2, 3, 7	1
Incidental Take of Wildlife, Birds, & Marine Mammals	x	Х	х		Х	х	Х	X	Х		X	3	A, B, C. F, G, H, N, R
Increased Surface Water Runoff	x			х		х			Х	Х		2, 3, 7	Y, II
Introduction of Non-native Species	x	х	х			х		Х	Х	х	Х	2, 3	G, K, KK
Impact to Public Use or Public Land	x	Х						Х	Х	Х	X	1, 2, 3, 8	B, F, H, L, BB, CC, FF
Impacts to existing infrastructure	X							Х	Х	Х	x	1, 2, 3, 7, 8	M, S, U
Construction Noise Impacts	X	х						Х	Х			3, 9	C, F, P, N, FF, JJ
Operational Noise Impacts										Х		9	F, P, FF
Potential Impacts to Vegetation, Wildlife, Fish, Birds, & Threatened Species	x	x	x	x	x	x	x	x	x	x	x	1, 2, 3, 6, 7, 8, 9	A, C. G, H, K, Q, R, T, DD,EE, JJ
Fish passage impacts		х										3	H, DD, JJ
Reduced Surface Water Recharge Rates	x		х		Х	х						2, 3, 6	V, Y, MM
Watercourse Realignment and Scouring		Х		х		х		X	Х			2	G, H, V
Seismic Hazards / Mass Wasting, Soil Liquefaction	x	Х						X	Х	х	X	1, 6, 11	х
Tundra Degradation, Thermokarst	x	х	x	х	Х				Х	х		2, 3, 6, 7	G, X, KK
Unanticipated Discovery of Cultural Resources	x	х	х					Х	Х		Х	1, 4	D, E
Unanticipated Discovery of Paleontological Resources	X	X						Х	Х		•	1, 4, 6	C, Z, AA
Unplanned spills/releases		X							Х	X	X	2	G, I, HH, II
Vegetation & Topsoil Degradation or Loss	X		Х	X				X				3, 7	G, II, KK

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DOCKET NO. PF14-21-000 DRAFT RESOURCE REPORT NO. 8 LAND USE, RECREATION, AND AESTHETICS

PUBLIC VERSION

	Project Activity												
Potential Impact	Grading, Clearing, Excavating (incl. Blasting), Trench, Pipelay, Backfill, Reclamation	Water Crossings (Pipelines & Bridges)	lce Roads & Pads	Erosion Control & Drainage Control	Water Withdrawal & Usage	Water Discharge	Solid Waste Storage & Disposal	General Infrastructure Activities	Facility Construction	Facility Operations	Offshore Construction	Resource Report No.	*Potential Plans to Address Impacts
Vertical and Horizontal Hydraulic Connectivity of Ground Water and Surface Water (Groundwater Discharge to Surface Water)	Х	х	х		x	x			x		x	2, 3	C, G, X, Y, MM
Visual Impacts	x	Х					х	Х	Х	Х	Х	1, 8	L, V, CC
Waste from Construction and Operations - Liquid and Solid, Hazardous and Non-Hazardous									x	x		2, 8	т
Impacts to Wetlands – footprint and functionality									Х			2	DD, EE
*Potential Plans to Address Activity	A, C, D, E, G, K, L, O, P, R, Z, GG, II, KK	D, E, G, H, I, K, L, O, V, Y, DD, EE, II, JJ	G, L, O, R	G, L, O, V, II, KK	G, L, O, MM	G, K, L, O Y, MM	G , O, T, Y, GG, HH	D, G, M, O, R, S, HH, II	D, E, F, G, K, M, P, R, S, T, W, X, Z, FF, GG, HH, JJ, II, MM	F, HH, J, K, O, P, R, T, W, FF, MM	D, E, G, M, N, O, P, Q, R, W	All	

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List of Potential Plans*

Α.	Avian Protection Plan	V.	Riparian Buffer Planting Plan
В.	Marine Logistics Shipping Plan	W.	Modeling Site-specific Impacts to Air Quality
C.	Blasting Plan		Emissions
D.	Unanticipated Cultural Resource Discovery Plan	Х.	Site-specific Geohazards Plan
E.	Cultural Resources Data Recovery Plans and/or	Υ.	Water Monitoring Plan
	Treatment Plans	Z.	Unanticipated Paleontological Discovery Plan
F.	Ambient Noise Level Studies	AA.	Paleontological Resources Management Plans
G.	FERC 2013 Wetland and Waterbody Construction and Mitigation Procedures with Requested	BB.	Site-specific Public Land Use and Recreational Use Coordination Plans
	Project-Specific Variances (the Applicants' Procedures) AKLNG Procedures	CC.	Visual Aesthetics Study
Н.	Site-specific Waterbody Crossing Plans	DD.	Site-specific Wetland Resources Crossing Plans (as required)
Ι.	HDD Inadvertent Release Plan (Project Specific HDD Contingency Plan)	EE.	Wetland Mitigation Plans
J.	Health Impact Assessment	FF.	Site-specific Noise Mitigation Plans (as required)
К.	Invasive Species Mitigation Plan	GG.	Unanticipated Contamination Discovery Plan
L.	Public Land Construction Plan	HH.	Spill Prevention, Control, and Countermeasure Plan (SPCC)
M.	Project Logistics Plans	П.	Storm Water Pollution Prevention Plan (SWPPP) -
N.	Marine Mammal Mitigation and Monitoring Plan		general and spread specific
0.	Mobile Emissions Control Plan	JJ.	Species-specific Wildlife Protection Plan
P.	Noise Control and Mitigation Plan	KK.	FERC 2013 Upland Erosion Control,
Q.	Plan of Cooperation (POC)		Revegetation, and Maintenance Plan with Requested Project-Specific Variances (the
R.	Polar Bear and Wildlife Interaction Plan		Applicants' Procedures) AKLNG Plan
S.	Project Transportation Plan	LL	Design/Operations Emissions Management Plan
Т.	Project Waste Management Plan	MM	Groundwater Management Plan

U. Project-specific Railroad crossing Plans

* In addition to the potential plans listed above, FERC requires implementation plans that outline how the Project will meet all required environmental permits and stipulations. The applicants will also prepare overarching Construction Environmental Management Plans and Operations Environmental Management Plans for the Project.