



SIDLEY AUSTIN LLP
1501 K STREET, N.W.
WASHINGTON, D.C. 20005
(202) 736 8000
(202) 736 8711 FAX

eelrod@sidley.com
(202) 736 8206

BEIJING
BRUSSELS
CHICAGO
DALLAS
FRANKFURT
GENEVA
HONG KONG
LONDON
LOS ANGELES

NEW YORK
PALO ALTO
SAN FRANCISCO
SHANGHAI
SINGAPORE
SYDNEY
TOKYO
WASHINGTON, D.C.

FOUNDED 1866

April 2, 2010

PUBLIC

Electronic filing

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E., Room 1A
Washington, DC 20426

**Re: OEP/DG2E/Gas 1
TransCanada Alaska Company LLC
Alaska Pipeline Project
Docket No. PF09-11-000**

Data-Gap Analysis & Field Study Plan Submittal

Dear Ms. Bose:

Transmitted herewith for filing is TransCanada Alaska Company LLC's response to the Commission's letter dated March 5, 2010, regarding the matter referenced above. As requested in the March 5 letter, this response:

1. Describes in detail the methods for generating the resource data-gap analysis;
2. Provides a summary report of the data-gap analysis results; and
3. Submits a field study plan that identifies the target start and completion time frames for each element or study needed to fill an identified gap, highlighting those elements/studies that are expected to require multiple field seasons to complete.



Kimberly D. Bose, Secretary
April 2, 2010
Page 2

Please contact Myron Fedak (907-564-3610) if you have any questions regarding this response.

Respectfully submitted,

/s/ Eugene R. Elrod

Eugene R. Elrod
Counsel for TransCanada Alaska Company LLC

Attachment 1: Methods for Generating the Resource Data-Gap Analysis
Attachment 2: Summary Report of the Data-Gap Analysis
Attachment 3: Field Study Plan

cc: Michael J. Boyle (OEP)
James Martin (OEP)
Laurence J. Sauter, Jr. (OEP)
Myron E. Fedak (Alaska Pipeline Project)
David J. Johnson (Alaska Pipeline Project)
Larry D. Harms (Alaska Pipeline Project)
James K. Morse (Alaska Pipeline Project)
Stacy L. Feltham (Alaska Pipeline Project)

ATTACHMENT 1

Methods for Generating the Resource Data-Gap Analysis

ATTACHMENT 1

TABLE OF CONTENTS

	Page
1.0 Description of Methods Used to Identify Environmental Resource Data Needs	1
1.1 Identify Information Needs	1
1.2 Identify and Evaluate Available Environmental Information.....	2
1.3 Determination of Data Gaps	4

LIST OF TABLES

Figure 1-1. Diagrammatic Representation of Environmental Information Needs Data Gap Analysis	5
---	---

1.0 Description of Methods Used to Identify Environmental Resource Data Needs

The methods employed to identify the environmental resource data needs for the Alaska Pipeline Project involved three primary tasks, each of which is described below:

- Identify information needs;
- Identify and evaluate available environmental information; and
- Determine data gaps.

While these tasks are presented in sequence below, identifying and evaluating available environmental data will continue as additional information becomes available.

Data needs were evaluated for the major components of the Alaska Pipeline Project including: a Gas Treatment Plant (GTP) on the North Slope, and pipeline segments from Pt. Thomson to the Alaska-Canada border, and Pt. Thomson to Valdez associated with the Alberta and Valdez options respectively. **Figure 1-1** shows a flowchart on the process used in determining data needs and gaps.

1.1 Identify Information Needs

Environmental and resource data requirements were identified based on Federal Energy Regulatory Commission (FERC) regulations associated with development of permit applications and other requirements to construct and operate the project (**Figure 1-1**). The environmental information needs fell into the following general subject categories which reflect the requirements of the various resource reports:

- surface waters;
- surface water use and quality;
- wetlands;
- groundwater use and quality;
- aquatic habitats and fisheries;
- vegetation, terrestrial habitats, land cover, timber;
- wildlife;
- endangered, threatened, and other protected and special status species;
- exotic (non-native) and invasive plants;
- cultural resources;
- socioeconomic condition;
- geology and geological resources;
- paleontological resources;
- soils;
- land use, recreation, and aesthetics;
- air quality;
- noise;
- pipeline construction practices and standards;
- regulatory and other best management practices, standards, and measures; and
- reliability and safety.

1.2 Identify and Evaluate Available Environmental Information

An extensive search was made of available historic and current environmental and resource information in print and electronic media to provide baseline, supplemental, or reference information, including:

- Published and scholarly literature including journals, books, monographs, theses, dissertations, and other articles;
- Technical reports, research reports, proceedings, booklets, circulars, manuscripts, maps;
- Statutes, regulations, policies, guidance, handbooks, manuals, procedures, and instructions;
- Documents prepared for regulatory compliance (e.g., Environmental Impact Statements, Environmental Assessments, Biological Assessments), project studies, technical reports, and other supporting information;
- Qualitative and quantitative data sets (databases), file records, raw data, tabulations, inventory data, summaries, and other collections or holdings; and,
- Imagery and geospatial data.

Environmental resource data were collected from a variety of national, state, regional, and local sources, including, but not limited to, the 2001 Alaska Gas Producers Pipeline Team (AGPPT) and the following:

State of Alaska

- Alaska Department of Natural Resources
 - Division of Mining, Land, and Water
 - Division of Parks and Outdoor Recreation
 - Office of History and Archaeology
 - Division of Oil and Gas
 - Division of Forestry
 - Division of Geological and Geophysical Surveys
 - Joint Pipeline Office; State Pipeline Coordinator's Office
- Alaska Department of Fish and Game
 - Division of Wildlife Conservation
 - Division of Habitat
 - Division of Sport Fish
 - Division of Commercial Fisheries
 - Division of Subsistence
- Alaska Department of Environmental Conservation
 - Division of Air Quality
 - Division of Spill Prevention and Response
 - Division of Water
- Department of Health and Social Services
 - Bureau of Vital Statistics
- Alaska Department of Transportation and Public Facilities
- Alaska Department of Commerce, Community, and Economic Development
 - Division of Community and Regional Affairs
- Alaska State Geo-Spatial Data Clearinghouse

Federal

- Federal Energy Regulatory Commission
- U.S. Environmental Protection Agency
 - Office of Environmental Information
 - Office of Prevention, Pesticides, and Toxic Substances

- Office of Air and Radiation
- Office of Water
- National Health and Environmental Effects Research Laboratory
- U.S. Department of the Interior
 - Fish and Wildlife Service
 - Fisheries and Ecological Services Program: Endangered Species, Marine Mammals Management, National Wetlands Inventory
 - Migratory Bird Management Program
 - Federal Subsistence Management Program
 - Environmental Conservation Online System
 - National Park Service
 - Bureau of Land Management
 - Minerals Management Service
 - Geological Survey
 - Alaska Science Center
 - Geospatial Information Office
- U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Fisheries Service
 - Office of Habitat Conservation
 - Office of Protected Resources
- U.S. Department of Agriculture, Forest Service
 - FSGeodata Clearinghouse, Geospatial Service and Technology Center
- U.S. Army Corps of Engineers
 - U.S. Army Cold Regions Research and Engineering Laboratory, Engineer Research and Development Center
 - Regulatory Program, Directorate of Civil Works

Universities, Research Institutes, Private Entities, Non-Profit Organizations, and Others

- Alaska Natural Heritage Program
- Alaska Statewide Digital Mapping Initiative
- Alyeska Pipeline Service Company
- Arctic Institute of North America
- Arctic Research Consortium of the U.S. (ARCUS)
- Fairbanks North Star Borough
- Gas Research Institute
- North Slope Borough
- Landscape, Fire and Resource Management Planning Tools Project (LANDFIRE)
- National Wildlife Federation, eNature
- NatureServe and NatureServe Explorer
- University of Alaska
 - Alaska Geobotany Center, Institute of Arctic Biology
 - Arctic Environmental Information and Data Center (AEIDC), Environment and Natural Resources Institute
 - Coastal Marine Institute, University of Alaska and U.S. Department of Interior Minerals Management Service Alaska Region
 - Environment and Natural Resources Institute
 - Geographic Information Network of Alaska
 - Geophysical Institute
 - Water and Environment Research Center

Available data has been gathered for a corridor based on the conceptual route identified for the 2010 Open Season. The corridor was intended to be wide enough to support the ongoing route development process and evaluations of alternative alignments.

The available historic and current environmental and resource data has been preliminarily evaluated relative to the following factors:

- Relevance considering spatial and temporal applicability;
- Reliability considering source, methods, assumptions, accuracy;
- Suitability considering objectives, scope, and context; and,
- Adequacy considering completeness, level of detail.

A detailed evaluation of the environmental information assembled to date will proceed relative to a more specific study area that will include a specific pipeline route and alternative sites for compressor stations, the gas treatment plant, ancillary pipe unloading and storage facilities, material sources, work camps, access roads, construction staging, and other ancillary features of the project. Additional applicable environmental information that becomes available as the project moves forward will likewise be evaluated.

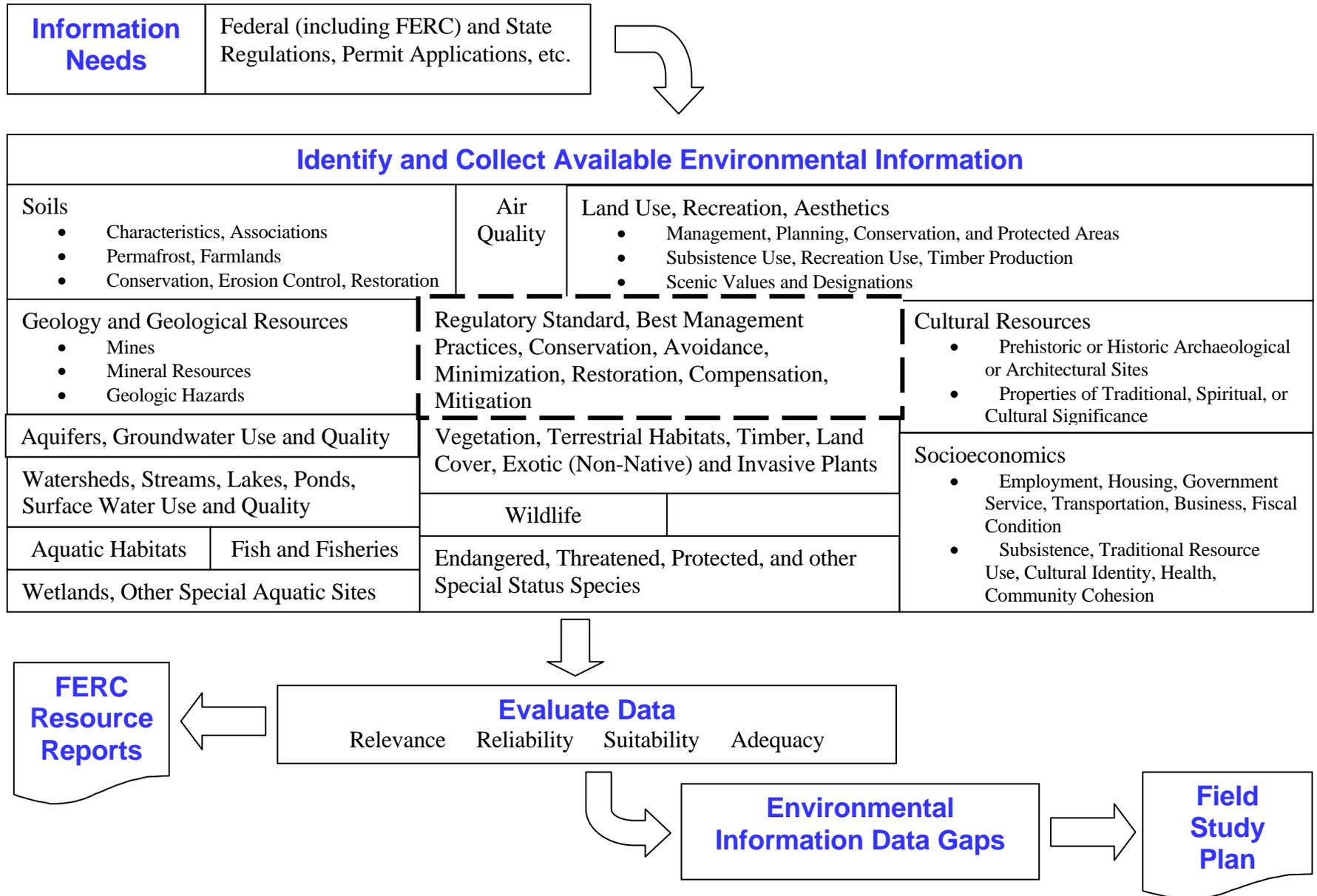
1.3 Determination of Data Gaps

The available environmental information was compared with the data needs to determine the additional information that would be necessary for a complete FERC filing based on guidance as provided in the *Guidance Manual for Environmental Report Preparation*.¹ At this time, the following three categories of data availability have been identified:

1. No environmental data is available;
2. Incomplete data with some available data, such as:
 - a. Datasets are reliable, suitable, and generally spatially applicable, but needs to be updated, more detail is necessary, or the geographic extent is limited; and,
 - b. Datasets are relevant and suitable, but it will be necessary to check for reliability;
3. No data gap exists, i.e., data is available, relevant, reliable, suitable, and adequate.

¹ Federal Energy Regulatory Commission (FERC) Office of Energy Projects, *Guidance Manual for Environmental Report Preparation*, August 2002, downloaded at <http://www.ferc.gov/industries/gas/enviro/guidelines.asp>.

Figure 1-1. Diagrammatic Representation of Environmental Information Needs Data Gap Analysis



ATTACHMENT 2

Summary Report of the Data Gap Results

ATTACHMENT 2

TABLE OF CONTENTS

2.0	Environmental Information Needs Analysis Summary.....	1
2.1	Resource Report 2 – Water Use and Quality	1
2.1.1	Groundwater	1
2.1.2	Surface Waters.....	2
2.1.3	Wetlands.....	4
2.2	Resource Report 3 – Fish, Wildlife, and Vegetation.....	5
2.2.1	Fisheries	5
2.2.2	Wildlife	7
2.2.3	Vegetation	11
2.2.4	Endangered and Threatened Species.....	13
2.3	Resource Report 4 – Cultural Resources.....	16
2.4	Resource Report 5 – Socioeconomics	19
2.5	Resource Report 6 – Geological Resources	21
2.6	Resource Report 7 – Soils.....	22
2.7	Resource Report 8 – Land Use, Recreation, and Aesthetics.....	24
2.7.1	Land Use and Recreation.....	24
2.7.2	Aesthetics	27
2.8	Resource Report 9 – Air and Noise Quality.....	29
2.8.1	Air Quality	29
2.8.2	Noise Quality	31

LIST OF TABLES

Table 2-1. Data Gaps for Water Use and Quality - Groundwater	2
Table 2-2. Water Use and Quality Data Gaps – Surface Water	4
Table 2-3. Water Use and Quality Data Gaps – Wetlands	5
Table 2-4. Data Gaps for Fisheries	7
Table 2-5. Data Gaps for Wildlife	10
Table 2-6. Data Gaps for Vegetation.....	13
Table 2-7. Endangered and Threatened Species in the Vicinity of the Alaska Pipeline Project	14
Table 2-8. Data Gaps for Endangered and Threatened Species	16
Table 2-9. Data Gaps for Cultural Resources.....	18
Table 2-10. Socioeconomic Data Gaps	20
Table 2-11. Geologic Resource Data Gaps	22
Table 2-12. Soils Data Gaps	23
Table 2-13. Data Gaps for land use, recreation, and aesthetics	28
Table 2-14. Data Gaps for Air Quality	30
Table 2-15. Noise Quality Data Gaps.....	32

2.0 Environmental Information Needs Analysis Summary

This section summarizes the preliminary assessment of available biological, physical, social, and other environmental resource information for the Alaska Pipeline Project, and identifies the data gaps in the context of the information necessary for the FERC environmental resource reports.

The information needs are described by general resource category or subject matter, correlating with the FERC resource reports, and are presented in the context of applicable regulatory authorities. This evaluation did not review the information needs for General Project Description (Resource Report 1), Alternatives (Resource Report 10), or Reliability and Safety (Resource Report 11); these reports require detail of project design, engineering, construction, and operation which will be developed prior to the FERC filing.

This section includes a general discussion of the overall availability of existing environmental information, a synopsis of the key relevant data sources, and a determination of the outstanding data requirements for the Alaska Pipeline Project.

2.1 Resource Report 2 – Water Use and Quality

Resource Report 2, Water Use and Quality, is required to quantitatively and qualitatively describe groundwater, surface waters, and wetlands, the impacts of construction on water use and water quality, and the effectiveness of mitigation, enhancement, or protective measures. The specific requirements are detailed in FERC guidance and regulation (18 Code of Federal Regulations [CFR] 380.12[d]). The available information to fulfill these requirements, and that needed for concurrent permit applications, is summarized below specific to groundwater, surface waters, and wetlands.

2.1.1 Groundwater

The following environmental resource information pertaining to groundwater is required for FERC Resource Report 2:

- Identification of all Environmental Protection Agency (EPA)- or state-designated sole-source aquifers crossed;
- Identification of all wellhead protection areas crossed; and,
- Identification of public and private water supply wells and springs within 150 feet of the proposed construction right-of-way (ROW).

Additional information needs include a discussion of potential effects of blasting to groundwater, and identification of potential mitigation measures for impacts to groundwater resources and measures to ensure that public and private water supplies are returned to their former capacity in the event of damage from construction. This will require engineering and construction detail in consideration of the environmental resource information.

Compared to other states, the extent of aquifer mapping and study in Alaska is limited. Those that have been mapped are described in Miller et al. (1999) and other sources, and summarized in the draft resource report prepared for AGPPT. A detailed description of groundwater resources is also found in the Final Environmental Impact Statement (FEIS) by the U.S. Department of Interior Bureau of Land Management (BLM) for the renewal of the ROW for the Trans-Alaska Pipeline System (TAPS).

With the exception of areas of deep permafrost, groundwater is available in most of Alaska, and is the source of drinking water for most Alaska residents. There is limited available information on the location of private potable wells in Alaska. Some datasets are available through the Alaska Department of Natural Resources (ADNR) Well Log Tracking System (WELTS); however, incomplete. In 2001, this database identified twenty potable wells within 200 feet of the construction area identified for the AGPPT route.

Certain public groundwater supply well records are maintained by the Alaska Department of Environmental Conservation (ADEC) Drinking Water Program. At this time, Alaska has no federal- or state-designated sole source aquifers. However, the ADEC is facilitating the protection of groundwater that serves as public drinking water through a Drinking Water Assessment Program which is compliant with the U.S. federal Safe Drinking Water Act (SDWA).

The U.S. Geological Survey (USGS) National Water Information System provides a variety of well and water quality data from numerous sites in the vicinity of the Alaska Pipeline Project. Most well data along the route is identified in the area of Fairbanks (including Fort Wainwright and Eielson Air Force Base), and small clusters appear in the vicinity of Big Delta, Delta Junction, and Fort Greely. The type of water quality and well data vary considerably. Data on all reported contaminated groundwater sites is available through the ADEC Contaminated Sites Program. Groundwater quality data is also available from the ADEC for monitoring wells required at certain locations (e.g., landfills) to identify potential groundwater impacts. The BLM’s TAPS ROW Renewal FEIS also identifies active contaminated sites along the TAPS.

A defined study area will facilitate a more detailed examination of the available information collected to date. However, the data gaps for groundwater resource information needs are identified in the following table.

Table 2-1. Data Gaps for Water Use and Quality - Groundwater

Information Need	Data Gaps
Identify all EPA- or state- designated sole-source aquifers crossed.	No data gaps.
Identify all wellhead protection areas.	No data gaps.
Identify public and private water supply wells and springs within 150 feet of the proposed construction ROW.	Incomplete data. Limited recorded information throughout Alaska.

2.1.2 Surface Waters

The following environmental information pertaining to surface waters is required for FERC Resource Report 2 and applicable federal permits:

- Identification, by milepost, of watershed areas, designated surface water protection areas, and sensitive waterbodies crossed by the proposed project.
- Identification, by milepost, of all perennial surface waterbodies crossed by the proposed project, their approximate width, and their state water quality classification, and any known potential pollutants present in the water or sediments. Indicate if potable water intakes are within 3 miles downstream of the crossing.
- Identification, by milepost, of all waterbody crossings that may have contaminated waters or sediments. Include offshore sediments.

Additional information needs for Resource Report 2 include: construction, mitigation, restoration, staging, and water use details that require consideration of the environmental resource information.

During preliminary examination of potential routing of the Alaska Pipeline Project, approximately 815 surface waters were identified along both the Alberta Option and Valdez Option routes. Under AGPPT, a draft Resource Report 2 describes the hydrology, physiographic features, and water quality in each of the four major hydrologic basins, five sub-basins, and 28 watersheds along the Alberta Option route between Prudhoe Bay and the U.S./Canada Border. Additional information on many of these water bodies, including a detailed description of the surface waters along much of the Valdez Option route is found in the BLM’s TAPS ROW Renewal FEIS and supporting documents. These documents describe two additional

hydrologic basins between Delta and Valdez. Considerable surface water data for the route between Point Thomson and Prudhoe Bay is available from environmental and other reports prepared for the state-proposed Eastern North Slope Gas Pipeline Project and the Point Thomson Project Environmental Report.

The watersheds of Alaska's North Slope are the focus of numerous ongoing studies by the Water and Environmental Research Center (WERC) of the University of Alaska, Fairbanks (UAF). Hydrology and environmental climate data is available for research sites from the Brooks Range to the Beaufort Sea. Data from a study of the Arctic Coastal Plain hydrology from the Sagavanirktok River east toward Bullen Point also is available from WERC, as is hydrologic information from an ongoing study of tundra lakes on the Beaufort Sea coastal plain.

The effects of the TAPS to surface water resources between Prudhoe Bay and Valdez is well described in the available literature, and there is considerable historic surface water data for this corridor collected in the 1970s and 1980s.

There currently are no federal- or state-designated surface water protection areas along the Alberta Option or Valdez Option routes. The North Slope Borough (NSB) manages the water utility in Deadhorse, which obtains water from a reservoir in the floodplain of the Sagavanirktok River or from Lake Colleen. Potable water is also taken from reservoirs created from exhausted gravel pits on the Kuparuk and Putuligayuk Rivers. No other public water sources or supplies are identified in the Prudhoe Bay area.

Public records maintained by the ADEC Contaminated Sites Program identify all contaminated sites, including contaminated waters or sediments, reported in Alaska. Two surface waters within the general project area are identified by the ADEC as 303(d) impaired waters.² Both of the water bodies are located near Fairbanks.

The Gas Treatment Plant (GTP) will require water for several purposes and activities including potable water for drinking and bathing, process water for the gas treatment process, and water for fire control. Fresh water and fresh water ice would be needed to create ice roads and pads for both the winter construction of the GTP and the pipeline. Also, water will be necessary for hydrostatic testing of the pipeline during construction. For pipeline construction, potable water will be needed for both temporary work camps along the route and at all work sites.

All navigable waters of the U.S. in the vicinity of the Alaska Pipeline Project have been identified. Tidal datum information is available to define the limits of the Beaufort Sea and Port Valdez (i.e., mean high water [MHW] and high tide line [HTL]). It will be necessary to document the Ordinary High Water Mark (OHWM) for the major rivers such as Chena, Yukon, Tolovana, Tanana, Chatanika, Kuparuk, and Sagavanirktok, rivers.

It will be necessary to verify and determine the jurisdictional boundary (i.e., OHWM) of other waters of the U.S. for the approximately 815 surface waters identified along the Alaska Pipeline Project. Available resources to make these determinations include 2008 aerial photography; 2009 Light Detection and Ranging (LiDAR) imagery and elevation data with a vertical accuracy of approximately 5 centimeters (cm); 2009 immersive video; and USGS topographic data.

A defined study area will facilitate a more detailed examination of the available information collected to date. However, the data gaps for surface water resource information needs are identified in the following table.

² ADEC is currently posting a public notice for the 2010 Alaska's List of Impaired or 303(d) Listed Waterbodies at: www.dec.state.ak.us/water/wqsar/waterbody/integratedreport.htm

Table 2-2. Water Use and Quality Data Gaps – Surface Water

Information Need	Data Gaps
Identify, by milepost, watershed areas, designated surface water protection areas, and sensitive waterbodies crossed by the proposed project.	No data gaps exist.
Identify, by milepost, all perennial surface waterbodies crossed by the proposed project, their approximate width, and their state water quality classification.	Incomplete data. Need to verify water bodies that may be crossed and identify their approximate width at the pipeline crossing location.
Indicate if potable water intakes are within 3 miles downstream of the crossing (needs to be done).	Incomplete data. Limited recorded information throughout Alaska.
Identify, by milepost, all waterbody crossings that may have contaminated waters or sediments. Include offshore sediments.	No data gaps exist.
Identify all navigable waters of the U.S. (Section 10 RHA)	Incomplete data. Need to identify the spatial limits (i.e., mean high water [MHW], OHWM) of waters that may be crossed.
Identify all traditional navigable waters of the U.S. and non-navigable tributaries of traditional navigable waters that are relatively permanent (i.e., tributaries that typically flow year-round or have continuous flow at least seasonally) (Section 404 CWA)	Incomplete data. Need to identify the spatial limits (i.e., high tide line [HTL], OHWM) of those waters that may be crossed.
Identify all non-navigable tributaries that do not typically flow year-round or have continuous flow at least seasonally (Section 404 CWA).	Incomplete data. Need to determine the extent of seasonal flow, make a significant nexus determination, and identify the spatial limits (i.e., HTL, OHWM) of those waters that may be crossed.

2.1.3 Wetlands

FERC requires that Resource Report 2 include the following environmental resource information for the Alaska Pipeline Project:

- Identification by milepost and facility location and wetland classification, all wetlands, major wetland complexes, and significant wetlands in the project area, and identify the length of each wetland crossed, the acreage of each wetland type, and total acreage of wetlands that would be affected by construction.
- Original National Wetlands Inventory (NWI) maps that show all proposed facilities and include milepost locations for proposed pipeline routes.

Additional information needed for this resource report includes a discussion of construction, mitigation, and restoration methods proposed for crossing wetlands, and a comparison to FERC staff’s Wetland and Waterbody Construction and Mitigation Procedures; a description of typical staging area requirements at wetland crossings; identification and a description of wetlands where staging areas are likely to be more extensive; a description of proposed measures to restore forested wetlands following construction, and to compensate for any permanent wetland losses; and a discussion of the potential for blasting to affect wetlands, and associated mitigation. This additional information includes engineering and construction detail that requires consideration of the wetland resource information.

NWI maps are available for much of the area along the Alberta and Valdez Option routes; however, they are not complete in a digital format. Additional wetlands mapping can be accomplished using data acquired to

date for the Alaska Pipeline Project including the 2008 aerial photography, 2009 LiDAR imagery, and 2009 immersive video. Field surveys will be necessary to verify and complete wetlands identifications and determinations.

A defined study area will facilitate a more detailed examination of the available information collected to date, including identifying the spatial extent of wetlands and the area that may be affected by the discharge of fill. However, the data gaps for wetland resource information needs are identified in the following table:

Table 2-3. Water Use and Quality Data Gaps – Wetlands

Information Need	Data Gaps
Identify by milepost and facility location and wetland classification, all wetlands, major wetland complexes, and significant wetlands in the project area, and identify the length of each wetland crossed, the acreage of each wetland type, and total acreage of wetlands that would be affected by construction.	Data incomplete. Approximate 20% spatial data gap; however, wetland can be identified and delineated based on recent air photo interpretation, LiDAR, and other imagery.
Provide original NWI maps that show all proposed facilities and include milepost locations for proposed pipeline routes.	Data incomplete. Digital NWI data coverage incomplete. Non-digital maps are available for areas not covered by digital data.
Identify wetlands provide preliminary jurisdictional determination.	Data incomplete. Additional information will be necessary to verify jurisdiction.

2.2 Resource Report 3 – Fish, Wildlife, and Vegetation

The requirements for Resource Report 3 are detailed in regulation (18 CFR 380.12[e]) and guidance (FERC 2002). This environmental report is required to describe existing fish, wildlife, and vegetation resources, the expected direct and indirect effects from the construction and operation of the proposed facilities, and the proposed mitigation; and to describe all consultations with federal and state fish and wildlife agencies, federal land management agencies, and others as applicable. The requirements for this resource report include those necessary for the consultation and/or conference requirements under the Endangered Species Act, and the Essential Fish Habitat (EFH) consultation requirements under the Magnuson-Stevens Fisheries Conservation and Management Act.

2.2.1 Fisheries

The following environmental information pertaining to fishery resources is required for FERC Resource Report 3:

- Classification and identification, by milepost or facility location, the fishery type of each surface waterbody that would be crossed or otherwise affected by the project, including commercial and sport fisheries, state fishery classification, which indicates the type of fishery the surface water supports (e.g., saltwater, anadromous), and associated significant habitat.
- Identification of representative fish species known to occur in the project vicinity.
- Description and identification, by pipeline segment, milepost, or facility location, any surface waters that support fisheries of special concern in the vicinity of the crossing location, e.g., habitats for protected species, waters assigned special state fishery management regulations, or waters that support commercial or tribal harvest.
- Identification of all federally listed EFH that potentially occurs in the vicinity of the project, and the provision of relevant information on all EFH, as identified by the pertinent Federal fishery management plans, that may be adversely affected by the project.

Additional information needed for this element of Resource Report 3 includes or requires engineering, construction, operation, maintenance, and/or mitigation detail that will need to be developed with consideration of the fisheries resource data described above. Other necessary information will be the outcome of consultation and correspondence with federal and state fish and wildlife agencies.

Riffle-pool complexes and vegetated shallows will need to be identified for the Alaska Pipeline Project. These, along with wetlands, mudflats, sanctuaries, and refuges, are defined as special aquatic sites, a special category of waters of the U.S., subject to USACE regulatory jurisdiction under Section 404 of the Clean Water Act. An authorization is required for the discharge of dredged or fill material into these areas.

As described above, approximately 815 surface waters have been identified along both the Alberta Option and Valdez Option routes. These waters support at least 22 species of freshwater and anadromous fish. Many of these species are identified as important to Native customary or subsistence use, or to sport fishing interests.

Fisheries resources are well described for approximately 300 waters along the TAPS as a result of historic and current survey and monitoring efforts. However, fish presence and abundance data in the approximate 50 waters between Point Thomson and Prudhoe Bay and 80 waters between Delta Junction and the U.S./Canada Border are limited. There are portions of the Alaska Pipeline Project routes that are not in close proximity to the TAPS, e.g., in the Prudhoe Bay area, near the Yukon River, near Fairbanks. Thus, the value of the TAPS fisheries data could decrease as the distance from the TAPS ROW increases.

For waterbodies crossed by the TAPS ROW or associated facilities, the BLM characterized stream habitat as “sensitive” or “critically sensitive,” based on fish presence and habitat use (e.g., spawning, overwintering) at a particular time of the year. This was in turn reflected in the TAPS Environmental Atlas (Alyeska Pipeline Service Company, 2002).

During preliminary examination of the Alaska Pipeline Project routes, available data on fish presence and habitat use by life stage were used to identify time periods that were critical for the protection of fish or fish habitat (e.g., spawning season), and periods when fish or fish habitat were considered sensitive to potential disturbance or other effects. This was based on numerous fishery reports issued by the Alaska Department of Fish and Game (ADF&G). Most describe research investigations for a specific watershed or waterbody.

The data gaps for fisheries resource information needs are identified in the following table.

Table 2-4. Data Gaps for Fisheries

Information Need	Data Gaps
Classification and identification, by milepost or facility location, the fishery type of each surface waterbody that would be crossed or otherwise affected by the project, including commercial and sport fisheries, state fishery classification which indicates the type of fishery the surface water supports (e.g., saltwater, anadromous), and associated significant habitat.	Incomplete data. Fishery type and classification is not known for approximately half of the waters identified in the vicinity of the Alaska Pipeline Project.
Identification of representative fish species known to occur in the project vicinity.	No data gaps exist.
Description and identification, by pipeline segment, milepost, or facility location, of any surface waters that support fisheries of special concern in the vicinity of the crossing location, e.g., habitats for protected species, waters assigned special state fishery management regulations, or waters that support commercial or tribal harvest.	Incomplete data. Fisheries of special concern (e.g., subsistence, personal use, and sportfish harvest) require verification.
Identification of all federally listed EFH that potentially occurs in the vicinity of the project, and the provision of relevant information on all EFH, as identified by the pertinent Federal fishery management plans, that may be adversely affected by the project.	No data gap exists.

2.2.2 Wildlife

The following environmental information pertaining to wildlife resources is required for FERC Resource Report 3:

- Identification of any existing or proposed National Wildlife Refuges, state wildlife management areas, or privately owned management areas or preserves that would be affected, and describe how and by whom they are managed;
- Description of the various types of terrestrial and wetland habitats (described by vegetative cover) that would be affected by the project;
- Description of representative wildlife species for the types of habitat described, identifying any unique species or individuals, species of special concern, and species with significant commercial, recreational or aesthetic value;
- Description of any significant biological resources that would be affected, a description of impacts, and any mitigation proposed to avoid or minimize that impact;
- Identification and description of significant or sensitive wildlife habitats crossed by the project, and a tabulation of the significant wildlife habitats crossed by the project;
- Evaluation and description of the short-term, long-term, and permanent impact on wildlife resources, aquatic and terrestrial species, and their habitats caused by construction and operation (including maintenance) of the proposed pipelines and above-ground facilities. Includes the possibility of major alteration to ecosystems or biodiversity, and any potential impact on state-listed endangered or threatened species;

- Calculation of the loss of forested habitats and significant habitats in terms of temporary impact (i.e., the construction ROW and all extra work areas) or permanent impacts (i.e., the portion of the permanent ROW that would be maintained in a cleared condition);
- An assessment of any cumulative effects of the project in combination with other existing or proposed projects;
- Description of site-specific mitigation measures to avoid or reduce impact on wildlife, especially significant habitats, or habitat with wildlife management areas or preserves;
- Time windows for crossing sensitive habitats, and any specific restoration plans, including plantings;
- Identification of any mitigation measures recommended by state or Federal agencies;
- Copies of correspondence containing recommendations from federal and state fish and wildlife agencies to avoid or limit impact on wildlife, fisheries, and vegetation, and the applicant's response to the recommendations; and,
- Copies of any studies or reports on field surveys that have been completed for the project.

Some identified information needs will only be applicable at the time the resource report is submitted, e.g., copies of studies or reports on field surveys, correspondence with and recommendations of agencies. Other needed information, (e.g., site-specific mitigation measures require engineering, design, construction, operation, and other detail) is unavailable at this point in the development of the Alaska Pipeline Project. These information needs are not included in the conclusions below.

The project must comply with the following federal laws pertaining directly to wildlife:

- Bald and Golden Eagle Protection Act (16 United States Code [USC] 668-668c)
- Marine Mammal Protection Act of 1972 (16 USC 1361 et seq.)
- Migratory Bird Treaty Act (16 USC 703-7112)
- Fish and Wildlife Conservation Act (16 USC 666(b))

For clearing, construction, or other activity that may result in the take of bald or golden eagles, or protected migratory birds, it could be necessary to obtain authorizations from the U.S. Fish and Wildlife Service (USFWS). Authorization from the USFWS is potentially necessary for activities that would result in the take of Pacific walrus or polar bear (the latter in association with Endangered Species Act compliance, see below). Authorization from the National Oceanic and Atmospheric Administration (NOAA) Fisheries Service under the Marine Mammal Protection Act (MMPA) could be necessary for activities (e.g., dredging, disposing of dredged material, construction, etc.) that would result in the take of other marine mammals (e.g., seals, dolphins, whales, etc.). Authorization could be required if marine mammals would be harassed, intentionally, or unintentionally. Whether these authorizations are required cannot be determined at this time; it would be determined through the process of evaluating the effects of the proposed action.

Overall, there is an abundance of available environmental information pertaining to wildlife resources. Because of the large volume of wildlife resource information, the following identifies only those that have synthesized or compiled resource data for a similar purpose (e.g., EISs), or similar large references.

Evaluations of past gas pipeline proposals and the TAPS project in Alaska have emphasized concern for big game. There is considerable available data on moose, caribou, Dall sheep, wolf, black bear and brown bear; the distribution, abundance, and habitat use is well documented. Also, the location and timing of major migrations and sensitive seasonal events (e.g., lambing, calving, rutting, over-wintering) is well known. The ADF&G Division of Wildlife Conservation is a valuable source of up-to-date information on game species. They maintain a sizable library of resource information pertaining to these game species, and regularly

publish management and harvest reports for moose, caribou, brown bear, black bear, wolves, Dall sheep, muskox, bison, and furbearers. A large amount of wildlife resource information has been obtained from the ADF&G. The ADF&G has also been the source of considerable information on subsistence wildlife harvest to identify species with significant value.

The National Marine Fisheries Service (NMFS) is the primary source of information on marine mammals of the Beaufort Sea and nearshore lagoon systems near Prudhoe Bay. Marine mammals are protected under the MMPA of 1972. Stock Assessment Report (SARs) on each marine mammal species are published annually by the NMFS, with any new information as it is available. Common marine mammal species in the Beaufort Sea near Prudhoe Bay include the bowhead whale, beluga whale, gray whale, ring seal, spotted seal, and bearded seal. Information on these species is also available from recent National Environmental Policy Act (NEPA) documents on offshore oil developments in the Beaufort Sea.

Previous pipeline studies also called attention to certain diurnal raptors: osprey, bald eagle, red-tailed hawk, rough-legged hawk, golden eagle, gyrfalcon, and two sub-species of peregrine falcon (*Falco peregrinus tundrius* and *anatum*). There are at least ten additional raptors, including six owls, that are known to occur in the vicinity of the Alaska Pipeline Project. All of these species are protected under the Migratory Bird Treaty Act.

Aerial surveys were conducted in June 2001 on cliff and bluff habitat and riparian woodland habitats along major streams and lake shorelines along the entire route of the AGPPT from Prudhoe Bay to the U.S./Canada Border. The focus of this effort was to locate raptors nests on cliffs or in large trees, including golden eagle, bald eagle, gyrfalcon, and the two sub-species of peregrine falcon. In addition to these species, the survey identified nests of red-tailed hawk, rough-legged hawk, and common raven.

A large amount of available data have been obtained by the project from the USFWS; they have a significant amount of publically available information on resident and migratory bird species, including waterfowl, shorebirds, seabirds, and passerines. The USFWS Conservation Library³ provides access to substantial information including technical publications, management plans, status reports, maps, and a variety of other print resources. Geospatial datasets are available from the USFWS Geospatial Services Office.⁴ The Alaska Regional Office and the Fairbanks Fish and Wildlife Office have provided numerous data sets, reports, and other information. Overall, a vast amount of resource data has been obtained from the USFWS for the Alaska Pipeline Project.

Geospatial data providing wildlife resource information have been obtained covering a wide range of wildlife resources as well as land ownership and/or management. Examples include:

- North Slope Eider Geodatabase (USFWS);
- Tanana Kuskokwim Geodatabase, waterbird survey observations (USFWS);
- Game Management Units (ADF&G);
- Caribou herd migration (BLM);
- Environmental Sensitivity Index (NOAA);
- Raptor Nest Sites (USFWS);
- Most Environmentally Sensitive Areas (MESA) - Polar Bear (ADF&G);
- MESA - Seabirds (ADF&G);

³ <http://library.fws.gov/Publications.html>

⁴ <http://www.fws.gov/GIS/index.htm>

- MESA – Waterfowl (ADF&G); and,
- Areas of Critical Environmental Concern (BLM).

Environmental information to support evaluations of the direct and indirect impacts to wildlife resources is abundant, and includes similar actions in portions of the project vicinity. One consideration that may require further examination, however, is the potential for noise from operation of the GTP to affect wildlife species.

The data gaps for wildlife information needs are identified in the following table:

Table 2-5. Data Gaps for Wildlife

Information Need	Data Gap
Identification of any existing or proposed National Wildlife Refuges, state wildlife management areas, or privately owned management areas or preserves that would be affected, and describe how and by whom they are managed.	No data gaps exist
Description of the various types of terrestrial and wetland habitats (described by vegetative cover) that would be affected by the project.	No data gaps exist
Description of representative wildlife species for the types of habitat described, identifying any species with significant commercial, recreational or aesthetic value.	No data gaps exist
Description of any significant biological resources that would be affected.	Incomplete data Preliminary identification only; verification required
Identification and description of significant or sensitive wildlife habitats crossed by the project, and a tabulation of the significant wildlife habitats crossed by the project.	Incomplete data Preliminary identification only; verification required
Calculation of the loss of forested habitats and significant habitats, and present in terms of temporary impact or permanent impacts.	Incomplete data
Evaluation and description of the short-term, long-term, and permanent impact on significant biological resources, wildlife resources, and wildlife habitats the caused by construction and operation (including maintenance) of the proposed pipelines and above-ground facilities. Include the possibility of major alteration to ecosystems or biodiversity, and any potential impact on state-listed endangered or threatened species.	Incomplete data
An assessment of any cumulative effects of the project in combination with other existing or proposed projects.	Incomplete data
Time windows for crossing sensitive habitats, and any specific restoration plans, including plantings.	Incomplete data Timing windows identified
Description of site-specific mitigation measures to avoid or reduce impact on significant biological resources, wildlife, especially significant habitats, or habitat with wildlife management areas or preserves.	Incomplete data

2.2.3 Vegetation

The following environmental information needs pertaining to vegetation is required for FERC Resource Report 3:

- Describe the major vegetative cover types that would be crossed or otherwise affected by the pipeline or aboveground facilities. Each cover type should include characteristic plant species. Describe the vegetation on the existing ROWs and within station yards or off-ROW work spaces that would be disturbed.
- Describe and identify by milepost and length of crossing any unique, sensitive, or protected vegetation types, plant communities, or individual trees (e.g., state specimen trees) that would be affected by construction, and the area of these types that would be within the permanent ROW.
- Describe any significant biological resources that would be affected. Describe impact and any mitigation proposed to avoid or minimize that impact.

Additional information needs include agency consultations and reviews; project maps and maps of area surveyed, and mitigation detail. These needs necessarily require the environmental data identified above, or the completion of specific tasks or processes (e.g., consultation), or engineering (e.g., areas where ancillary features may be located), and other detail (e.g., project map) that is unavailable at this early stage in the development of the Alaska Pipeline Project. Other necessary information (i.e., status) is applicable only at the time the resource report is submitted.

It will be necessary to describe and identify by milepost and by length of crossing, vegetative cover types and any unique, sensitive, or protected vegetation types or plant communities that would be affected by project construction and operation. State specimen or other unique plants will also need to be identified. This detail will be specific to the Alaska Pipeline Project footprint including all ancillary features. However, there is considerable existing information that will serve as a framework for characterizing, identifying, and delineating the boundaries of expected vegetative cover types in the project area.

Vegetative cover datasets are partially complete for the proposed GTP site including geospatial data, regional and site specific reports, and botanical references. Geospatial data includes USGS, Ecoregions of Alaska, and Circumpolar Arctic Vegetation Mapping (CAVM) Alaska Flora maps.

The vegetation types, associated landforms, and dominant plant species are well documented for the entire pipeline route for both the Alberta and Valdez Options. Mapping of major vegetation types along the Alaska Highway from Delta Junction to the U.S./Canada Border also appears complete.

The draft Resource Report 3 for the AGPPT describes major vegetative communities (including dominant plant species) along the Alaska Pipeline Project route. It characterizes vegetation by three major ecological provinces, the Arctic Coastal Plain, Brooks Range, and Interior Forests. It further characterizes vegetation types within these provinces as tundra, open land (non-tundra areas dominated by shrubs, and low-growing trees), and forest. The Alaska Pipeline Project route between Prudhoe Bay and the U.S./Canada Border crosses approximately 172 miles of tundra, 200 miles of open land, and 330 miles of forest land.

Major vegetation types were classified and mapped from the Beaufort Sea coast inland for approximately 30 miles by the Circumpolar Arctic Vegetation Mapping Team in 2003. Vegetation types were also classified between Point Thomson and the Badami area based on color infrared and natural color photography taken in the 1990s. Vegetation types were mapped at a scale of 1:1,000 feet.

The BLM's TAPS ROW Renewal FEIS described vegetation types. Among the figures and other components of the FEIS, however, there does not appear to be a delineation of each of these vegetation cover types along the TAPS corridor.

USFWS National Wetlands Inventory maps identified 74 unique vegetation complexes (vegetation types). This comprehensive characterization of land cover types along the TAPS route will correspond to the cover

types expected along the Alaska Pipeline Project routes for the Alberta Option from Prudhoe Bay to the U.S./Canada Border, and the Valdez Option from Prudhoe Bay to Valdez.

The *Alaska Gap Analysis Project* is currently preparing a state-wide land cover map (1:100,000). This and other land cover mapping efforts will provide a basis for the more detailed land cover mapping for the Alaska Pipeline Project route. Habitat types along the route will be delineated through aerial photo interpretation. Project terrain mapping, LIDAR imagery, and a digital elevation model will supplement this effort.

The ADF&G has comprehensive descriptions of 32 ecoregions in Alaska based on climate, vegetation, vegetation communities, land use, and land management.

A state-wide land cover map is currently being prepared by the Landscape Fire and Resource management Planning Tools Project (LANDFIRE), a multi-agency partnership that includes the USGS, USFS, and the U.S. Department of the Interior. The Alaska mapping effort is currently underway and is scheduled to be completed in September 2010. Information will include existing vegetation type, cover, and height; canopy cover, height, base height, and bulk density; as well as succession class, slope, elevation, and several layers pertaining to fire behavior, regime, and danger. Although the effort is incomplete, some information, including vegetation type and cover is available.

Information on ecological site descriptors of forestland and rangeland is also available from the U.S. Natural Resources Conservation Service Ecological Site Information System.

The available geographic information system (GIS) data on land cover types in Alaska will provide a framework for classifying vegetation cover types, and a starting point for aerial photo interpretation along the routes to identify primary land cover types, and determine appropriate field sampling needs. Recent aerial photography of the Alaska Pipeline Project area is available for interpreting and delineating boundaries of land cover types along the route, including wetlands. It is anticipated that some field verification sampling will be needed along the Alaska Pipeline Project route.

The Chugach National Forest possesses a GIS database of the land cover mapping. The hierarchical classification system and descriptions of vegetation communities would be applicable for areas along the Valdez Option route south of Thompson Pass. Information on vegetative composition, physical setting, and key species for nearly 200 vegetative community types within the Chugach National Forest is available.

The data gaps for vegetation resource information needs are identified in the following table.

Table 2-6. Data Gaps for Vegetation

Information Need	Data Gaps
Identify major vegetative cover types crossed or otherwise affected by the pipeline or aboveground facilities including the existing rights-of-way and within station yards or off-right-of-way work spaces.	Incomplete data.
Describe and identify by milepost and length of crossing any unique, sensitive, or protected vegetation types, plant communities, affected by construction, and the area of these types within the permanent right-of-way.	Incomplete data.
Describe any significant biological resources that would be affected. Describe impact and any mitigation proposed to avoid or minimize that impact.	Incomplete data.

2.2.4 Endangered and Threatened Species

In accordance with Section 7 of the Endangered Species Act (ESA), FERC, as the lead federal agency, will be required to consult with the USFWS or NMFS with regard to all listed endangered and threatened species. The USFWS, in the Department of the Interior, is the primary agency responsible for the conservation of fish and wildlife and would be consulted for land and freshwater species. The NMFS, under the NOAA in the Department of Commerce, has many responsibilities including the protection of marine resources and would be consulted regarding marine and anadromous species. It is anticipated that a Biological Assessment would be prepared to identify the direct, indirect, and cumulative effects to endangered and threatened species and any modification of designated critical habitat, and would identify the effects to any species proposed for listing as endangered or threatened and any modification of proposed critical habitat. It would also detail all conservation measures that would be implemented to avoid and minimize potential adverse effects on the listed and proposed species and to avoid and minimize potential adverse modification of designated or proposed critical habitat.

The following information pertaining to endangered and threatened species is required for FERC Resource Report 3:

- Identification of all federally listed or proposed endangered or threatened species and critical habitat that potentially occur in the vicinity of the project.
- A brief description of each of the species, including general background information appropriate to the project area (e.g., regional distribution, habitat preference, and important dates for activities such as breeding, nesting, calving, migration, or overwintering), as well as project-specific information such as locations of designated critical habitat, suitable habitat, and/or occupied habitat.
- Description of the expected and potential impacts (both positive and negative) to endangered and threatened species from project construction and operation (including maintenance activities). Include an assessment of cumulative effects of the proposed project in combination with other existing or proposed projects.
- Description of site-specific mitigation measures to minimize negative impacts on endangered and threatened species.

- The results of any surveys, identified during informal consultation as necessary, must have been conducted for all accessible project areas, and the results included in the application unless seasonal consideration make this impractical.
- A timetable for completing surveys and filing survey reports for those areas not accessible at the time of application.
- Survey reports and USFWS and/or NMFS comments on those reports.
- Discussion of the results of the consultations and/or conferences with the applicable agencies. Identify specific recommendations made by the USFWS or NMFS, and address all comments and recommendations from these agencies.
- Copies of correspondence containing recommendations from federal and state fish and wildlife agencies to avoid or limit impact on endangered and threatened species, and the applicant's response to the recommendations.
- Consult with the appropriate state agencies to determine state-listed endangered or threatened species that potentially occur in the vicinity of the project, and provide the same information as for federally listed or proposed species.

Some identified information needs will only be applicable at the time the resource report is submitted, e.g. the status of consultations or surveys, copies of correspondence. Other needed information, e.g., site-specific mitigation measures requires engineering, design, construction, operation, and other detail that is unavailable at this point in the development of the Alaska Pipeline Project. These information needs are not included in the conclusions below.

Federally-listed endangered or threatened species that may potentially occur in the vicinity of the Alaska Pipeline Project have been identified. The listed species, along with candidates for listing, are shown in the following table.

Table 2-7. Endangered and Threatened Species in the Vicinity of the Alaska Pipeline Project

Species/Status	Habitats in the vicinity of the Alaska Pipeline Project	Comments
Eskimo curlew/ Endangered	Thought to be extinct.	No reliable sightings since 1987; no documented breeding on Alaska's Arctic Coastal Plain since 1983 No designated critical habitat No recovery plan Also classified as endangered by the State of Alaska
Spectacled eider Threatened	Breeding range extends across Arctic Coastal Plain. Nests within the vicinity of GTP and Alberta Option route from Prudhoe Bay to the foothills of the Brooks Range. No designated Critical Habitat in the vicinity of the Alaska Pipeline Project.	Recovery Plan issued in 1996
Steller's eider Threatened	Current breeding range extends across Arctic Coastal Plain from Prudhoe Bay westward to Wainwright, Alaska. No designated critical habitat in the	Recovery Plan issued in 2001.

Table 2-7. Endangered and Threatened Species in the Vicinity of the Alaska Pipeline Project

Species/Status	Habitats in the vicinity of the Alaska Pipeline Project	Comments
	vicinity of the Alaska Pipeline Project.	
Polar bear Threatened	Foraging and denning habitats offshore in the Beaufort Sea and onshore in the Arctic Coastal Plain as far as 25 miles or more inland from the coast. Proposed Critical Habitat on October 29, 2009. Portions of the Alaska Pipeline Project from Prudhoe to Point Thomson are within the proposed Critical Habitat.	Listed as threatened on May 15, 2008. Currently, a Recovery Plan is being developed
Bowhead whale Endangered	Offshore in Beaufort Sea	No recovery plan No designated critical habitat
Gray whale (delisted)	Offshore in Beaufort Sea	The gray whale was delisted from the ESA in 1994.
Yellow-billed loon Candidate	Breeding range extends across the Arctic Coastal Plain; includes Alaska Pipeline Project from Point Thomson to Prudhoe Bay and southward to the northern foothills of the Brooks Range.	Listing Category 8 USFWS concluded in 2009 that listing was “warranted but precluded by other higher priority listing actions.” Conservation agreement signed by USFWS, ADF&G, ADNR, BLM, National Park Service, and North Slope Borough to participate in eliminating and reducing threats to the species on lands under their management.
Kittlitz’s murrelet Candidate	Breeding range includes southernmost portion of Valdez Option	Listing Category 2
<i>Candidate species are plants and animals for which the USFWS or NOAA Fisheries has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. A listing priority, on a scale of 1 (highest) to 12 (lowest), is assigned to the candidate species.</i>		

The distribution, abundance, habitat use, and behavior of the endangered and threatened species are well documented. Potential risks and effects of human activities are generally known, as are appropriate conservation measures to avoid and minimize effects to these species.

The draft Resource Report 3 prepared for AGPPT provides a general overview of baseline conditions for spectacled and Steller’s eiders, but the information is now dated (Natural Resource Group [NRG] 2002). The draft report did not address the bowhead whale. It also did not address the polar bear as it was neither listed, proposed or a candidate at that time. Also, the yellow-billed loon and Kittlitz’s murrelet were not proposed or candidate species at the time the resource report was written.

Available geospatial datasets on polar bears from the USGS and the USFWS have been gathered and examined. This includes suitable denning habitat, and the proposed critical habitat for the polar bear.

Available information for endangered and threatened species includes recovery plans; federal register notices pertaining to listing, critical habitat, or regulations; agency status reports; and Biological Assessments or Biological Opinions developed for other proposed actions in the vicinity of the project.

The data gaps for endangered and threatened species resource information needs are identified in the following table.

Table 2-8. Data Gaps for Endangered and Threatened Species

Information Need	Data Gap
Identification of all federally-listed or proposed endangered or threatened species and critical habitat that potentially occur in the vicinity of the project.	No data gaps exist.
A brief description of each of the species, including general background information appropriate to the project area (e.g., regional distribution, habitat preference, and important dates for activities such as breeding, nesting, calving, migration, or overwintering), as well as project-specific information such as locations of designated critical habitat, suitable habitat, and/or occupied habitat.	No data gaps
Description of the expected and potential impacts (both positive and negative) to endangered and threatened species from project construction and operation (including maintenance activities). Include and assessment of cumulative effects of the proposed project in combination with other existing or proposed projects.	Incomplete data
Description of site-specific mitigation measures to minimize negative impacts on endangered and threatened species.	Incomplete data
Consult with the appropriate state agencies to determine state-listed endangered or threatened species that potentially occur in the vicinity of the project, and provide the same information as for federally listed or proposed species.	Incomplete data Data complete to identify and describe state-listed species in the vicinity of the project.

2.3 Resource Report 4 – Cultural Resources

Resource Report 4 addresses the nature and extent of cultural resources, including any historic properties (districts, buildings, structures, sites, and/or objects on or eligible for the National Register of Historic Places), or any Native American traditional cultural places within the project’s Area of Potential Effect (APE). The requirements for this resource report are detailed in 18 CFR 380.12(f) and in FERC guidance. These requirements primarily relate to the statutory responsibilities of FERC and other Federal agencies to comply with Section 106 of the National Historic Preservation Act (NHPA).

The following environmental information will be required for Resource Report 4:

- Identification of the project APE in terms of direct or indirect effects to known cultural resources;
- Initiate, as applicable, consultation with the State Historic Preservation Office (SHPO), BLM, Department of Defense (DOD), ADNR, USFWS, and other land management agencies, and with Alaska Native tribes and organizations, and interested parties, and document the need for cultural resource surveys and the level of survey effort required;
- Documentation of the results of comprehensive field investigations and delineating all identified sites within the construction corridor (including all ancillary facilities such as pipe storage yards, material sites, camps, etc);
- A narrative summary of the overview results, cultural resource surveys completed, identified cultural resources, and any cultural resource issues;

- A summary table of identified cultural resources;
- A project specific Ethnographic Analysis;
- An Unanticipated Discoveries Plan for the project area, referencing appropriate state statutes;
- A summary and summary table of the status of cultural resources investigations undertaken to date including identification by milepost of any areas which could not be surveyed because the landowner denied access; and a schedule for completing any outstanding cultural resource studies; and,
- Overview/Survey Report(s).

Additional information needs include agency consultations and reviews; project maps and maps of area surveyed; overview/survey report(s); and a schedule for completing outstanding surveys. These needs necessarily require the completion of specific tasks or processes (e.g., consultation), or engineering (e.g., areas where ancillary features may be located), and other details (e.g., project map) that are unavailable at this early in the development of the Alaska Pipeline Project. Other necessary information (i.e., status) is applicable only at the time the resource report is submitted.

The ADNR Office of History and Archaeology (OHA) maintains the Alaska Heritage Resources Survey (AHRIS) database. The AHRIS is the central inventory of known historic and prehistoric sites. The data includes site location, condition, National Register of Historic Places (NRHP) eligibility status (i.e., listed, determined eligible, no determination of eligibility completed), citations, and other available information. The location of information in the AHRIS is restricted by OHA, and is generally unavailable for public dissemination. AHRIS data has been obtained for the Alaska Pipeline Project routes from Prudhoe Bay to the U.S./Canada Border, and to Valdez. Similar data has not yet been received for the route from Point Thomson to Prudhoe Bay. A GIS shape file was created from the data to identify potential constraints that may affect routing and siting.

Federal land-management agencies (e.g., BLM, DOD) maintain records of cultural resource inventory that may not be reflected in the AHRIS. This information would be available for applicable lands along the Alaska Pipeline Project route.

In 2001, Northern Land Use Research, Inc. and Chumis Cultural Resources Services (NLUR/Chumis) conducted Phase I, reconnaissance level, cultural resources surveys in most of the route examined for AGPPT. A total of 122 cultural resources sites were identified within 10,495 acres of ground surveys (pedestrian transects) and 44,760 acres of aerial surveys (via helicopter). The surveys did not include areas of ancillary features such as material sites, pipeline storage areas, access roads, and construction camps. This effort also summarizes greater than 1,000 cultural resource sites, based on historic archaeological investigations, within five miles of the AGPPT route. This summary identifies the proximity to the AGPPT corridor, eligibility for the National Register of Historic Places, and a brief description of 76 sites that were located within 500 feet of the AGPPT centerline.

AGPPT sponsored a report that included comprehensive descriptions of the proposed project (including history of route revisions), consultations, access constraints, permits and approvals. This report contains the following elements that are directly applicable to the Alaska Pipeline Project:

- a comprehensive and detailed overview of the legal and regulatory framework for cultural resource protection and management;
- a comprehensive review of the prehistoric and historic cultural environments along the corridor;
- the date, location, intensity, and results of approximately 140 previous archaeological investigations within five miles of the AGPPT route centerline, dating as far back as 1853; and,
- a detailed description of the survey research design and predictive modeling, and methods.

At this time, approximately 65 percent of the Alaska Pipeline Project route for the Alberta Option coincides with the AGPPT route. Nearly 60 percent of the 2001 AGPPT cultural resource survey points, lines, and areas coincide with this Alaska Pipeline Project route.

Cultural resource surveys have been completed for several major projects in the vicinity of the Alaska Pipeline Project and the AHRS has most of the locations and summary information stored in the database. However, it will be necessary to determine whether the specific detail from the survey efforts can be obtained.

It will be necessary to examine the available data against a defined study area for a detailed determination of data gaps and survey requirements. However, at this time, the following describes a general indication of environmental data gaps currently identified.

Table 2-9. Data Gaps for Cultural Resources

Information Need	Data Availability
Identification of the project APE in terms of direct or indirect effects to known cultural resources.	Incomplete data Requires location of GTP, pipeline routes, project work areas, proposed compressor stations, storage fields, work camps, and other facilities and areas.
A project-specific Ethnographic Analysis	Incomplete data The analysis is mostly complete for the Alberta Option, but does not include the corridor for the Valdez Option
An Unanticipated Discoveries Plan for the project area, referencing appropriate state statutes, for dealing with the unanticipated discovery of historic properties or human remains.	Incomplete data The plan for AGPPT is applicable to some extent, subject to update, revision, and project-specific detail
A narrative summary of the overview results, cultural resource surveys completed, identified cultural resources, and any cultural resource issues.	Incomplete data Considerable information is available from the work completed for AGPPT.
A summary table of identified cultural resources	Incomplete data Considerable information is available from the work completed for AGPPT.

2.4 Resource Report 5 – Socioeconomics

Resource Report 5 - Socioeconomics is required to describe the existing socioeconomic conditions and quantify the impact of construction and operation of the Alaska Pipeline Project on population, employment, housing, displacement of residences or businesses, infrastructure, construction payroll and material purchase, tax revenues, transportation, local government services, economic value of removal of agricultural lands, pasturelands, and timberlands; and Environmental Justice⁵ (Executive Order [EO] 12898).

Information needs associated with the Alaska Pipeline Project include on-site manpower requirements, total payroll and materials purchased during construction, vacancy rates and availability of temporary housing, number of residences and businesses displaced by the project, Native subsistence activities and economics, public health, government expenditures for public services, and the repair, maintenance, and upgrades of infrastructure.

Socioeconomic datasets are available for 28 of 43 communities within the vicinity of the Alberta Option and Valdez Option routes. The Alaska Department of Commerce (ADC) Community Profile Database (CPD) is a good, primary source of socioeconomic information for towns, cities, and villages in Alaska. The database provides information related to population size, median income, employment, housing, local government services, local tax revenues, and local businesses. The U.S. Bureau of Labor and Statistics (USBLS) is also a valuable source of socioeconomic information related to unemployment, inflation, consumer price index, and other generic economic information. The U.S. Census Bureau (USCB) provides information regarding population size, age structure of those populations, employment rates, mean household income, education levels, housing types, and mean value of owner-occupied housing. Some of these data have been organized into the USCB American Community Survey (ACS) database. The most recent demographic and housing estimates in ACS are for the three year period beginning 2006 and ending in 2008. The ACS database provides Alaska-wide statistics on education, marital status, relationships, and fertility (number of births by age). Demographic data are also available from this database including housing units, sex and age structure, and race. Some of the economic data available in ACS included income, employment, occupation, and information related to commuting to and from work.

Socioeconomic Information can also be gathered from recent Environmental Assessment and Environmental Impact Statement (EIS) documents for other major federal actions that have been proposed for the NSB and interior Alaska. Similar to the CPD, these documents contain information on local, state, and federal revenues; employment and personal income; employment history and the subsistence economy; cultural importance of subsistence and community harvest patterns; social cultural systems; institutional and non-governmental organizations, tribal government, and Alaska Native Corporations. For interior Alaska, several EIS documents written for action proposed at Fort Wainwright provide socioeconomic data for the Fairbanks area.

Public health effects have been addressed in most EIS documents published over the last four years for projects in Alaska to comply with the Federal Environmental Justice Policy (EO 12898). The State of Alaska is currently involved in efforts to integrate with Federal environmental and regulatory reviews, the requirement of a health impact analysis (HIA). An HIA is the primary mechanism by which health concerns have recently been incorporated into policies and projects. Agencies involved include the Department of Health and Social Services (Environmental Public Health Program), ADNR, BLM, and EPA.

⁵ The U.S. Environmental Protection Agency (EPA) defines Environmental Justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (cited from EPA website: <http://www.epa.gov/compliance/ej/> on March 30, 2010).

Basic health data (births, deaths, medical center use, prenatal care rates, risk behaviors, hospitalizations, epidemiology information etc.) are available through the Alaska Bureau of Vital Statistics and Alaska Center for Health Data and Statistics (ACHDS), which are part of Alaska State Health and Social Services, Division of Public Health. Injuries and hospitalization statistics can be obtained through the Alaska Trauma Registry. Alaska Behavior Risk Factor Surveillance System (AK BRFSS) is another source of information related to mental wellbeing for adults. The Alaska Youth Risk Behavior Survey provides similar mental wellbeing statistics for minors. Publicly available health information is often limited due to privacy issues. In smaller Alaskan communities, information may be further limited due to the potential that an individual could be identified based on demographic or other identifiers. These small populations can also limit the availability and usefulness of statistical health information.

The Alaska Native Epidemiology Center (“EpiCenter”) administered by the Alaska Native Tribal Health Care Consortium, is one of 11 tribal epidemiology centers established by the Indian Health Service (IHS) to assist the National IHS Epidemiology Program in improving the health of Alaska Natives and American Indians throughout the United States. It supports and serves Alaska tribal health organizations by coordinating, collecting, analyzing, and disseminating timely, accurate, and essential health data. It also supports these organizations by providing technical assistance and advocating for Alaska Native health issues.

National databases from which health information can be obtained for Alaska include the Centers for Disease Control (CDC), Cancer Control PLANET, the USCB, U.S. Department of Veterans Affairs, North American Association of Central Cancer Registries, Northwest Renal Network, and Renal Data Extraction and Referencing System.

Subsistence is a tangible part of Alaska Native economies. Information on subsistence resources, communities that are dependent on those resources and the social and economic impact of Native subsistence is documented along portions of the Alaska Pipeline Project for the Alberta and Valdez Options. Subsistence activities are monitored on federal land and on state land by the ADF&G, Division of Subsistence.

The data gaps for socioeconomic information needs are identified in the following table.

Table 2-10. Socioeconomic Data Gaps

Information Need	Data Gaps
Impact of any substantial immigration of people on governmental facilities and services.	Incomplete data
On-site manpower requirements for the project.	Incomplete data
The number of units and vacancy rates for temporary housing.	Incomplete data
The number and type of residences and businesses that would be displaced by the project.	Incomplete data
The number and composition of the existing workforce.	Incomplete data
An estimate of the total worker payroll and materials purchased during construction and operation.	Incomplete data
Per capita income and current unemployment rate.	No data gap exists
Current population and population densities.	No data gap exists
Determine if existing housing within the impact area is sufficient to meet the needs of the additional population.	Incomplete data
Condition and proximity of major transportation routes including airports, airstrips, highways, water and rail.	No data gap exists
Location and availability of local government public services.	No data gap exists
Status of local tax revenues and sources of funding for supporting	No data gap exists

Information Need	Data Gaps
public services.	
Human health, social, and economic effects of the project on minority and low income communities, Native American programs and Native subsistence.	No data gap exists
Fiscal impact analysis of local government expenditures and revenues from construction of the project.	Incomplete data

2.5 Resource Report 6 – Geological Resources

The following environmental resource information pertaining to geological resources is required for FERC Resource Report 6 to describe the mineral resources and geological hazards that might be affected by the project or could place the project at risk. Also, this resource report evaluates the potential effects of the project on those resources or of those hazards on the project, and methods to reduce or avoid the effects or risks. Specific requirements include:

- Identify the location (by milepost) of mineral resources and any planned or active surface mines crossed by the proposed facilities;
- Describe hazards to the facilities from mining activities, including subsidence, blasting, slumping or landsliding or other ground failure;
- Identify any geologic hazards to the proposed facilities; and,
- Discuss the need for and locations where blasting may be necessary in order to construct the proposed facilities.

The Alaska Pipeline Project crosses four major physiographic regions. These include the North Slope, Brooks Range, Yukon-Tanana Uplands, and the Tanana River Valley. The GTP and portions of the Alberta and Valdez Option pipeline routes are within the Arctic Coastal Plain province, which is in the North Slope physiographic region.

In general, there is an abundance of publicly-available information regarding mineral resources, geology and seismic risk for the project area based on the information collected for previous pipeline projects. The USGS Mineral Resources Data Systems' (MRDS) database is one of many geological databases available through the USGS that can be used for this purpose. Additionally, the ADNRC Divisions of Mining, Lands, and Water maintains ownership records of mining claims, including gravel mines.

Most mineral resources near or within the Alaska Pipeline Project routes consist of existing or former sand and gravel operations, quarries and tailing ponds. The closest active gravel mine operation to the GTP component of the project is the State owned PUT 23 mine site south of the GTP. These mineral resources are well documented because sand and gravel mining has been conducted on the North Slope to support existing oil and gas operations for decades. Construction of the Alaska Pipeline Project will require use of gravel/borrow materials, which would be sourced from existing or new mines.

Blasting for pipeline placement may be required in soils with cobbles and boulders, abrasive gravels, bedrock, and other extremely hard, frozen terrain. A combination of information from currently available geological databases and field verification techniques at individual locations can be used to address blasting operations required for the Alaska Pipeline Project.

Geological hazards and data describing these hazards are widely available for Alaska. The hazards include seismicity, soil liquefaction, slope instability, subsidence, and flooding. There are several known seismic fault areas along the Alberta and Valdez Option routes that have been previously mapped and studied. Slope stability and ground subsidence associated with the thawing of ice-rich permafrost is a significant

hazard to be addressed in the project design and construction planning utilizing existing and project specific geotechnical data.

The State of Alaska and USGS both maintain information concerning paleontological resources along the Alaska Pipeline Project routes. Information on paleontological resources is also available from BLM for Galbraith Lake, Toolik Lake, and Snowden Mountain Areas of Critical Environmental Concern (ACECs). It will be necessary to consult with the BLM and, if applicable, the USFWS, and other federal land management agencies to determine their specific requirements for surveys for paleontological resources on their lands. Where data are lacking, field surveys can be conducted. Additional information, as necessary, will be obtained through a literature review.

The data gaps for geologic information needs are identified in the following table.

Table 2-11. Geologic Resource Data Gaps

Information Need	Data Gaps
Identify the location (by milepost) of mineral resources and any planned or active surface mines crossed by the proposed facilities	Incomplete data
Identify any geologic hazards to the proposed facilities.	Incomplete data
Discuss the need for and locations where blasting may be necessary in order to construct the proposed facilities.	Incomplete data

2.6 Resource Report 7 – Soils

Resource Report No. 7 – Soils is required to describe the existing soil types, associations, and characteristics, and to quantify and mitigate the impact of construction and operation of the Alaska Pipeline Project on soils. The requirements for Resource Report 7 are detailed in 18 CFR 380.12 (I) (1) and described in FERC guidance (FERC 2002, p. 3-71 – 3-75).

The following soils information is required for FERC Resource Report 7:

- Identify, describe, and group, by milepost, the soils affected by the proposed pipeline and above ground facilities;
- List the soil associations by milepost and describe their characteristics;
- For above ground facilities occupying more than 5 acres, determine the acreage of prime farmland soils that would be affected by construction and operation. Include: list of soil series and describe their characteristics and percentages within the site, indicate the onsite percentage of each series that would be permanently affected, and indicate which series are considered prime or unique farmland;
- Describe by milepost, potential impacts on soils;
- Identify proposed mitigation to minimize impact on soils and compare with the FERC’s Upland Erosion Control, Revegetation, and Maintenance Plan (Plan); and,
- Identify any measures of the Plan that are deemed unnecessary, technically infeasible, or unsuitable and describe alternative measures that will ensure an equal or greater level of protection.

There are several different types of data that can be used together to describe soils along the Alaska Pipeline Project routes. Generally, the use of computerized database products developed by the National Resource Conservation Service (NRCS) is considered the most expeditious method for obtaining soils data for projects of the Alaska Pipeline Project’s magnitude. NRCS offers several broad scale and finer scaled soil mapping products for assessing the impacts of a project on soils. The primary source of broad scale soil

interpretation data are the Major Land Resource Areas (MLRAs). MLRA data provide geological associated land resources at a 1:7,500,000 scale. This data is used by NRCS and others for landscape level agricultural planning. MRLA units are classified based on similar geology, climate, and land use. Fifteen MLRAs are recognized in Alaska. Of these 15 MLRAs, five will likely be encountered along the Alaska Pipeline Project routes. These five MLRA map units crossed by Alaska Pipeline Project in Alaska include the Arctic Coastal Plain, Arctic Slope, Brooks Range, Interior Alaska Highlands, and Interior Alaska Lowlands.

NRCS data includes the State Soil Geographic (STATSGO) database. The Alaska STATSGO database is provided for commonly used GIS programs at a scale of 1:1,000,000. STATSGO data can be used in conjunction with Digital Elevation Models (DEMs). DEMs can provide information related to slope and aspect.

Permafrost is a major defining characteristic in Alaska and is expected to be encountered along much of the Alaska Pipeline Project routes. The presence of permafrost is recognized at the taxonomic subgroup level in the STATSGO database. Permafrost is soil that has a mean annual temperature less than 0° C and implies the presence of permafrost within 60 inches of the soil surface. However, the actual depth and morphology of permafrost cannot be directly quantified, but must be inferred from related soil properties such as texture, drainage class, and landscape settings provided in soil descriptions.

Permafrost maps of Alaska are available through the National Snow and Ice Data Center. This data set consists of a geo-referenced digital map and attributes data derived from the publication ‘Permafrost Map of Alaska.’ The map is presented at a scale of 1 to 2,500,000 and shows the correlation of physiographic province to presence of permafrost across the state of Alaska.

A general understanding of the distribution of continuous and discontinuous permafrost is relatively well established on a macro-scale. Continuous permafrost is primarily found within the North Slope Region with some areas south of Atigun Pass. Extensive discontinuous permafrost exists along the Alaska Pipeline Project routes south of Coldfoot, Alaska, from the Yukon and Tanana River Valleys to the U.S./Canada Border. Thaw-unstable permafrost soils subject to subsidence are generally present along the alignment on the Arctic Coastal Plain and North Slope of the Brooks Range.

It may be necessary to request unpublished soils information from the NRCS, BLM, DNR, and others. It will also be necessary to examine the available data for the study area acquired or developed in support of the engineering design and construction planning activities.

The data gaps for soils information needs are identified in the following table.

Table 2-12. Soils Data Gaps

Information Need	Data Gaps
Identify, describe, and group, by milepost, the soils affected by the proposed pipeline and above ground facilities.	Incomplete data
List the soil associations by milepost and describe their characteristics.	Incomplete data
For above ground facilities occupying more than 5 acres, determine the acreage of prime farmland soils that would be affected by construction and operation. Include: list of soil series and describe their characteristics and percentages within the site, indicate the onsite percentage of each series that would be permanently affected, and indicate which series are considered prime or unique farmland.	Incomplete data
Describe by milepost, potential impacts on soils	Incomplete data
Identify proposed mitigation to minimize impact on soils and compare with the FERC’s Upland Erosion Control, Revegetation, and	Incomplete data

Information Need	Data Gaps
Maintenance Plan (Plan).	
Identify any measures of the Plan that are deemed unnecessary, technically infeasible, or unsuitable and describe alternative measures that will ensure an equal or greater level of protection.	Incomplete data
Develop mitigation strategies to protect permafrost.	Incomplete data

2.7 Resource Report 8 – Land Use, Recreation, and Aesthetics

Resource Report No. 8 – Land Use, Recreation, and Aesthetics is required to describe the construction and operation of the Alaska Pipeline Project on existing rights-of way; residential and commercial business; special land issues; lands administered by federal, state, or local agencies or private conservation organizations; natural recreational and scenic areas and registered natural landmarks; any facilities within designated coastal zone management areas, and designated or proposed National or State Wild and Scenic Rivers. The requirements for Resource Report 8 are detailed in 18 CFR 380.12 (j) (1), 18 CFR 380.12 (j) (4), 18 CFR 380.12 (j) (5), 18 CFR 380.12 (j) (6), and 18 CFR 380.12 (j) (7), and described in FERC guidance (FERC 2002, p. 3-77 – 3-98).

2.7.1 Land Use and Recreation

The following information is required for FERC Resource Report 8 for Land Use:

- Classify and quantify land use affected by:
 - Pipeline construction and permanent ROWs;
 - Extra work/staging areas;
 - Access roads;
 - Pipe and contractor yards; and,
 - Aboveground facilities.
- Identify by milepost all locations where the pipeline ROW would at least partially coincide with existing ROW, where it would be adjacent to existing ROWs, and where it would be outside of existing ROW. This may apply to the offshore as well.
- Provide detailed typical construction ROW cross-section diagrams showing information such as widths and relative locations of existing ROWs, new permanent ROW, and temporary construction ROW.
- Summarize the total acreage of land affected by construction and operation of the project. This applies to the offshore as well.
- Identify by milepost all planned residential or commercial/business development and the time frame for construction.
 - Identify all planned development crossed or within 0.25 mile of proposed facilities.
- 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.
 - Identify all buildings within 50 feet of the construction ROW or extra work areas;
 - Describe the management and use of all public lands that would be crossed;
 - Provide a list of landowners by milepost or tract number that corresponds to information on alignment sheets; and,
 - Provide a site-specific construction plan for residences within 50 feet of construction ROW or extra work area.

- Identify by milepost special land uses (e.g., specialty crops, natural areas, national and state forests, conservation land, etc.).
 - This applies to the offshore as well, special anchoring or lightering areas, and shipping lanes.
- Identify by beginning milepost and length of crossing all land administered by Federal, state, or local agencies, or private conservation organizations.
- 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.
- Identify by milepost all residences that would be within 50 feet of the construction ROW or extra work area.
- Identify by milepost all natural, recreational, or scenic areas and all registered natural landmarks crossed by the project.

A significant amount of information concerning land use along the Alaska Pipeline Project routes exist, including thorough documentation written for TAPS and AGPPT. The AGPPT information will need to be assessed more closely in relation to current land use plans developed by federal and state landowners. There is a tremendous volume of digital data available that describes varying land uses from the perspective of current land owners. As with all databases that are publically available, the data will need to be validated before it is used to prepare the resource report. The tremendous availability of information concerning land use is due in large part to the fact that over 90 percent of Alaska lands are public lands, which are actively managed by these entities. Consequently, much of the baseline data work has already been accomplished on a broader scale.

The federal government is the largest land owner within the State of Alaska, accounting for just over 60 percent of the total land base. The BLM is the largest land manager within Alaska, followed closely by the USFWS, National Park Service (NPS), and USFS. Nearly 30 percent of Alaska is State owned. The remaining 10 percent is owned by other entities. To date, the State has received approximately 85 percent of the 90 million acres designated to be conveyed from the U.S. federal government. In 1971, ANSCA granted 44 million acres to village and Native corporations and gave Native selections priority over State selections.

General land ownership, land use classification maps, and maps depicting Alaska Native Regional Corporation and Village Corporation lands are readily available and have been acquired for the Alaska Pipeline Project. Most of the public lands along the Alaska Pipeline Project routes is owned and managed by either BLM or ADNR. Other land owners along the Alaska Pipeline Project routes include the following: three incorporated Cities and Boroughs (Fairbanks, North Pole, and Valdez); two incorporated boroughs, (Fairbanks North Star and North Slope); three unincorporated boroughs (Yukon-Koyukuk, Tanana-Tetlin, and Copper River); and Alaska Native Regional and Village corporation lands, (i.e., Doyon Ltd., Dot Lake Village Corporation, Tetlin Village Corporation, Village of Northway, Tanacross). In 2001, AGPPT identified the number of acres of forest, tundra, commercial, industrial, and residential land intersected by their route. Structures within 150 feet of either side of the pipeline centerline were also identified through photogrammetric interpretation (review of aerial photography). AGPPT identified 110 recreational and special interest areas that would be crossed by the proposed project and that would be within one-quarter mile of 83 recreational and special interest areas. The general project area borders the Arctic, Yukon Flats and Tetlin National Wildlife Refuges (NWRs).

Five land use plans exercise jurisdiction over the Alaska Pipeline Project including: NSB Coastal Management Plan, Copper River Basin Land Use Plan, Delta and Gulkana Wild and Scenic Rivers, Valdez Area Coastal Zone Management Plan, and Valdez Duck Flats Area Meriting Special Attention Plan.

Land within the Prudhoe Bay Unit (PBU) is leased from the State of Alaska for industrial purposes in support of the development of oil and gas resources. All land within the PBU is owned by the State. The proposed GTP site is located in the NSB on State lands, within the PBU and NSB coastal zone management area. Existing road and pipeline corridors are held by non-exclusive State ROW and leases.

The Alaska Pipeline Project routes parallel three major highways and the TAPS route, and, also are in the proximity to several existing oil and gas related facilities and pipelines associated with the Prudhoe Bay Field. A more detailed summary of available data describing known infrastructure and utility information will be provided after completion of the design phase. Similar to the pipeline proposed in AGPPT 2001, the Alaska Pipeline Project Alberta Option will loosely follow the existing Tran Alaska Pipeline System, Dalton Highway, Elliott Highway, and the Alaska Highway to the U.S./Canadian border. Under the Valdez Option, the route is identical to the Alberta Option except the alignment does not follow the Alaska Highway at Delta Junction but continues south along the Richardson Highway to Valdez.

Existing major ROWs along the Alaska Pipeline Project routes include: TAPS, James Dalton Highway, Elliot Highway, Trans Alaska Gas System, Alaska Highway, Alaska Natural Gas Transportation System, Richardson Highway, Yukon Pacific Corporation, and the Alaska Railroad.

Also, there are several large coal-fired power plants and possibly some smaller diesel fuel-fired rural utilities that will be encountered. The Petro Star refinery, Solomon Gulch hydroelectric facility and hatchery and the Alyeska Terminal are located within the proposed pipeline study corridor.

The Alaska Pipeline Project Team can use the information from the USGS MRDS database to assess gravel/borrow resources along the Alaska Pipeline Project routes. The MRDS is one of many geological databases available through the USGS that could be used for this purpose.

Information concerning the location of utilities within the Fairbanks North Star Borough, Fairbanks, Eielson Air Force Base, Fort Wainwright, and along the TAPS ROW from Pump Station 1 to Pump Station 4 needs to be collected including: Kuparuk oil line; gathering lines; Haines Fairbanks product pipeline; buried communication, electrical and other utility lines; and TAPS fuel gas pipeline between PS1 and PS4.

There are 31 public, military, municipal, and private airports, heliports and airstrips proximate to the Alaska Pipeline Project routes. Two are located in the Point Thomson to Badami area, 12 between Prudhoe Bay and the Yukon River, four between Yukon River and Delta Junction, 12 between Delta Junction and Canada, and five between Delta Junction and Valdez.

Access to air and marine transportation has not been fully explored. Marine transportation to the North Slope is limited to a seasonal window nominally between late July and early September, when the coast is ice-free. There are three docks for unloading barges at Prudhoe Bay; however, one is no longer in use. There are no community based docks. Once unloaded, freight must be taken by road to its destination, as there are no rail connections.

For the Alaska Pipeline Project, the major effort involved in preparing Resource Report 8 will be in quantifying individual impacts to land use on a finer scale along the Alaska Pipeline Project routes and within the footprint of the GTP and obtaining up-to-date private landowner information, particularly with respect to native allotments. It will be necessary to validate private land ownership along the Alaska Pipeline Project routes as well.

Significant information is available regarding the annual cycle of subsistence activity by month and subsistence resources for several communities along the Alaska Pipeline Project routes. Hunting and fishing opportunities on the North Slope are generally limited to subsistence harvest by Alaska Natives, primarily for bowhead whales and caribou.

Numerous information resources are available regarding local, state, and federal recreational sites or potential area along the Alaska Pipeline Project routes. Information concerning special use and recreational areas is available for several federal and state land managers, including U.S. Forest Service, National

Wildlife Refuges, National Wilderness Preservation System, ADNR, Division of Forestry, BLM, ADF&G, University of Alaska, and DOD. For the GTP component of the project, outdoor recreation is limited within the PBU and Point Thomson area because of security. Most outdoor recreational activities that take place on the North Slope are located in the Arctic National Wildlife Refuge (ANWR), National Petroleum Reserve Alaska (NPR), and along the Dalton Highway. Public access is allowed on State lands that are not in unitized operating areas, but there are no associated facilities. All of these information resources will be used during project engineering and construction planning in order to quantify impacts and develop mitigation measures.

2.7.2 Aesthetics

The following information is required for FERC Resource Report 8 for Aesthetics:

- Identify all designated or proposed candidate National or State Wild and Scenic Rivers crossed by the project.
- Describe any measures to visually screen aboveground facilities, such as compressor stations.

Information regarding designated National or State Wild and Scenic Rivers is readily available and includes the Delta and Gulkana Wild and Scenic Rivers along the Valdez Option.

BLM has an established method for assessing visual resources on its lands, which coincide with a significant portion of the Alaska Pipeline Project routes; therefore, visual resources on BLM lands are well known and have been catalogued. Many of the visual or scenic resources were previously identified by the BLM for the TAPS line between Prudhoe Bay and Delta Junction, and between Delta Junction and Valdez.

Four Class I visual resource management areas have been identified by the EPA under the Clean Air Act (CAA), two of which may need to be evaluated for potential impacts associated with the Alaska Pipeline Project. These Class I areas include Denali National Park and Tuxedni Wilderness. In addition, National Wildlife Refuges found in close proximity to the Alaska Pipeline Project route are classified by EPA as Class II areas of special concern.

The data gaps for land use, recreation, and aesthetics information needs are identified in the following table.

Table 2-13. Data Gaps for land use, recreation, and aesthetics

Information Need	Data Gaps
Classify and quantify land use affected by: Pipeline construction and permanent rights-of-way; Extra work/staging areas; Access roads; Pipe and contractor yards; and Aboveground facilities	Incomplete data Engineering and construction plans need to be developed.
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.	Incomplete data
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 right-of-way and temporary construction right-of-way.	Incomplete data Engineering and construction plans need to be developed.
Summarize the total acreage of land affected by construction and operation of the project.	Incomplete data. Engineering and construction plans need to be developed.
Identify by milepost all planned residential or commercial/business development and the time frame for construction.	Incomplete data
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.	Incomplete data
Identify by milepost special land uses	Incomplete data
Identify by beginning milepost and length of crossing all land administered by Federal, state, or local agencies, or private conservation organizations.	Incomplete data
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.	Incomplete data
Identify by milepost all residence that would be within 50 feet of the construction right-of- way or extra work area.	Incomplete data
Identify by milepost all natural, recreational, or scenic areas and all registered natural landmarks crossed by the project	Incomplete data
Identify all designated or proposed candidate National or State Wild and Scenic Rivers crossed by the project.	Incomplete data
Describe any measures to visually screen aboveground facilities, such as compressor stations.	Incomplete data

2.8 Resource Report 9 – Air and Noise Quality

Report No. 9, Air and Noise Quality, is required to quantitatively and qualitatively describe ambient air quality and noise, the impacts of construction and maintenance on ambient air and noise quality, and the effectiveness of mitigation, enhancement, or protective measures. The available information to fulfill these requirements, and that needed for concurrent permit applications, is summarized below specific to air quality and noise.

2.8.1 Air Quality

The following environmental resource information pertaining to air quality is required for FERC Resource Report 9:

- A description of existing air quality in the vicinity of the project, including attainment/nonattainment status for all criteria pollutants and the identification of any Federal Class I areas where visibility or other impact analyses may be required;
- Provide the background levels of nitrogen dioxide (NO₂) and other criteria pollutants that would be emitted above EPA-identified significance levels;
- Quantify existing and proposed emissions of compressor equipment, plus construction emissions, including nitrogen oxides (NO_x) and carbon monoxide (CO), and the basis for these calculations;
- Summarize the anticipated air quality impacts for each new or existing station and for the project;
- Provide the emission rate of NO_x from existing and proposed facilities, expressed in pounds per hour and tons per year for maximum operating conditions, include supporting calculations, emission factors, fuel consumption rate, and annual hours of operation; and,
- Provide estimates of pollutant emissions, air quality impacts of the emissions, and demonstrate compliance with State Implementation Plans (SIPs). Propose mitigation if violations are predicted to show that emissions would conform to SIPs and applicable standards.

Additional information needs for this resource report include specification for all fuel-burning and emitting equipment, such as manufacturer make and model number (as available), type of compression, fuel source, horsepower (at standard conditions and at station conditions), expected annual hours of operation, short term and annual emission rates in grams per horsepower-hour (g/hp-hr) and tons/year, respectively for criteria and hazardous air pollutants. A description of the minimum mitigation measures required by regulation; as well as, additional mitigation measures the Alaska Pipeline Project will initiate to mitigate air quality impacts is also required. Copies of submitted permit applications, regulatory applicability determinations, and any agency determinations will need to be included with Resource Report 9 as well. In order to complete this resource report, engineering and operational details will be required to address existing background conditions and quantify impacts to ambient air quality.

There is a large amount of both public and privately available meteorological data, and to a lesser extent, pollutant data. Existing meteorological data should be adequate to support permitting; however, these datasets will need to be obtained from the State and evaluated to ensure it meets the data quality objectives for permitting.

Publicly available ambient air monitoring datasets are available from six state-operated monitoring stations in Alaska and for stationary sources for which major source permitting has been completed. Only the Fairbanks Northstar Borough station, which monitors CO, PM_{2.5}, and PM₁₀, is in the vicinity of the Alaska Pipeline Project routes. The next closest station is the Denali National Park monitoring station (in the Yukon-Koyukuk Census Area), which monitors PM_{2.5} and O₃. Also, ambient air quality datasets are available from CASTNet, a regional long-term environmental monitoring program administered by the EPA to assess trends in dry and wet acidic depositions due to emission reduction regulations. Another potential

source of ambient air background information could be Alyeska Pipeline Services Company (Alyeska) and several North Slope oil and gas exploration and production companies. Alyeska has been collecting ambient air monitoring data at its Valdez Marine Terminal since 2004. Similarly, there are several ambient air quality and meteorological monitor stations that have operated within the greater Prudhoe Bay operating area for several decades.

A defined study area and proposed sites for the GTP and compressor stations will be needed to facilitate a more detailed examination of the available information collected to date. However, the data gaps for air quality data needs are identified in the following table.

Table 2-14. Data Gaps for Air Quality

Information Need	Data Gaps
A description of existing air quality in the vicinity of the project, including attainment/nonattainment status for all criteria pollutants and the identification of any Federal Class I areas where visibility or other impact analyses may be required.	Incomplete data. Need to understand physical parameters for plausible project operating conditions to conduct screening dispersion modeling to evaluate potential on-site and off-site concentrations for comparison with worker exposure limits and ambient air quality standards.
Provide the background levels of NO ₂ and other criteria pollutants that would be emitted above EPA-identified significance levels.	Incomplete data. Available data will need to be procured and evaluated for representativeness as ambient background.
Quantify existing and proposed emissions of compressor equipment, plus construction emissions, including NO _x and CO, and the basis for these calculations.	Incomplete data. Need to quantify construction phase emissions by identifying fleet information. Will need to obtain short-term emission rate data, including NO _x and CO emission rates. Greenhouse gas (GHG) emissions for all phases of the project, construction through operation required.
Summarize the anticipated air quality impacts for each new or existing station and for the project.	Incomplete data. Available pollutant and meteorological data have not been reviewed for representativeness and minimum data quality objectives. A modeling protocol will need to be approved and modeling demonstration completed.
Provide the emission rate of NO _x from existing and proposed facilities, expressed in pounds per hour and tons per year for maximum operating conditions, include supporting calculations, emission factors, fuel consumption rate, and annual hours of operation.	Incomplete data. Preliminary emission calculations have been completed for the corridor compressor stations; however, it is anticipated these analyses will need to be revised.

2.8.2 Noise Quality

The following environmental resource information pertaining to noise is required for FERC Resource Report 9:

- Identify any nearby noise-sensitive area (NSA) by distance and direction from the proposed compressor unit building/enclosure;
- Identify any applicable state or local noise regulations. Specify how the facility will meet the regulations;
- Quantify the existing noise levels (day-night sound level [Ldn] and other applicable noise parameters) at NSAs and at other areas covered by relevant state and local noise ordinances;
- For compressor station sites, measure or estimate the existing ambient sound environment based on current land uses and activities. Include a plot plan that identifies the locations and duration of noise measurements. Describe conditions during the noise survey including time of day, duration of measurements, weather conditions, wind speed and direction, engine load, and other noise sources present during each measurement;
- Calculate the noise impact at noise-sensitive areas of the proposed compressor unit modifications or additions, specifying how the impact was calculated, including manufacturer's data and proposed noise control equipment. Include step-by-step calculation or identify the computer program used to model the noise levels, the input and raw output data and all assumptions made when running the model, far-field sound level data for maximum facility operation, and the source of the data. Include sound pressure levels for un-muffled engine inlets and exhausts, engine casings, and cooling equipment; dynamic insertion loss for all mufflers; sound transmission loss for all compressor building components, including walls, roofs, doors, windows, and ventilation openings; sound attenuation from the station to nearby NSAs; the manufacturer's name, the model number, the performance rating; and a description of each noise source and noise control component to be employed at the proposed compressor station; and,
- Specify possible measures to mitigate any impact to noise quality, including mufflers, insulation of piping and building, and orientation of equipment away from NSAs. Include manufacturer's specification for equipment proposed to reduce the noise level(s) from the unit(s) to 55 dBA Ldn at nearby NSAs. Specify which noise reduction measures would be implemented and a schedule for implementing the measures.

Noise impacts associated with the Alaska Pipeline Project would occur along two time scales, construction and operation. Construction noise is likely to be intermittent while construction is taking place at any one location. Much of the pipeline construction will likely occur during winter months. Summer construction would likely be focused on compressor station locations. For temporary noise sources, it will likely be unnecessary to provide a noise survey of the existing ambient sound levels near the pipeline construction areas.

For the compressor stations, pre-construction ambient sound levels near the stations may need to be assessed. During operation of the proposed facilities, the noise impact associated with the project would be limited to the immediate vicinity of the compressor stations.

Primary noise sources during the operation of the compressor stations are the gas turbine air intakes/exhausts and compressor units. Other less significant noise sources include ancillary equipment such as lube oil coolers, lube oil demisters, gas aftercoolers, and station piping/valves.

Detailed engineering design, construction execution plans, and facilities operational data will be required to complete the noise evaluation for Resource Report 9. The data gaps for noise quality data needs are identified in the following table.

Table 2-15. Noise Quality Data Gaps

Information Need	Data Gaps
Identify any nearby NSA by distance and direction from the proposed compressor unit building/enclosure.	Incomplete data. Preliminary plot plans identifying NSAs in relation to the compressor stations and to a lesser the Alaska Pipeline Project corridor will need to be prepared. Once baseline data becomes available, the plot plans would need to be updated to identify the locations and duration of noise measurements in relation to the NSAs.
Identify any applicable state or local noise regulations. Specify how the facility will meet the regulations.	Incomplete data. An assessment of applicable state and local noise regulations has not been performed for the project.
Quantify the existing noise levels (day-night sound level [L _{dn}] and other applicable noise parameters) at NSAs and at other areas covered by relevant state and local noise ordinances	Incomplete data. Background sound levels have not been quantified. Initial estimates of existing noise levels can be based on current land use; however, noise monitoring stations will likely need to be established to quantify noise impacts on identified NSAs.
Measure or estimate the existing ambient sound environment based on current land uses and activities. Include a plot plan that identifies the locations and duration of noise measurements. Describe conditions during the noise survey including time of day, duration of measurements, weather conditions, wind speed and direction, engine load, and other noise sources present during each measurement.	Incomplete data. Plot plans will be developed during project engineering.
Calculate the noise impact at noise-sensitive areas of the proposed compressor unit modifications or additions, specifying how the impact was calculated, including manufacturer's data and proposed noise control equipment	Incomplete data.
Specify possible measures to mitigate any impact to noise quality.	Incomplete data.

ATTACHMENT 3

Field Study Plan

ATTACHMENT 3

TABLE OF CONTENTS

3.0 Field Study Plan..... 1

3.1 Water Use and Quality 1

3.2 Fish, Wildlife, and Vegetation..... 2

3.2.1 Fish..... 2

3.2.2 Vegetation and Wildlife..... 3

3.3 Cultural Resources 3

3.4 Socioeconomics..... 3

3.5 Soils 3

3.6 Geological Resources..... 4

3.7 Land Use, Recreation and Aesthetics 4

3.8 Air Quality..... 4

3.9 Noise..... 4

3.10 Logistics and Field Operations 4

3.11 Schedule..... 5

LIST OF TABLES

Table 3-1. Schedule for completion of pre-field activities. 5

Table 3-2. Alaska Pipeline Project Environmental Field Schedule - Preliminary 6

3.0 Field Study Plan

This initial Field Study Plan is based on the results of the environmental information needs analysis described in Sections 1.0 and 2.0. The Plan identifies the field activities and studies aimed at acquiring outstanding information necessary for preparing the FERC Resource Reports.

Environmental information needs include resource data that have been gathered but not evaluated, those that are not currently readily available, those that are not otherwise available, and those that are specifically required to be gathered within a specified geographic project area.

The program objectives are as follows:

- A. To gather environmental data for preparing and contributing to the following eight FERC resource reports:
 2. Water Use and Quality
 3. Fish, Wildlife, and Vegetation
 4. Cultural Resources
 5. Socioeconomics
 6. Geological Resources
 7. Soils
 8. Land Use, Recreation, and Aesthetics
 9. Air and Noise Quality
- B. To collect information necessary for federal permit applications and other submissions that are to be developed concurrently with the FERC filing.
- C. To provide information related to system alternatives and construction options.
- D. To gather environmental data to assist FERC in complying with the National Environmental Policy Act.

The following activities would occur before any field work is initiated:

- Identifying the project study areas applicable to the environmental resource needs;
- Securing rights of entry, permits, and authorizations;
- Native and stakeholder engagement;
- Public and landowner notification and outreach;
- Securing transportation, accommodations, field offices, equipment, materials, and other logistics;
- Safety and other training; and,
- Surveying and marking (flagging or staking) the study corridor, as necessary.

3.1 Water Use and Quality

Aerial photos, topographic maps, National Wetlands Inventory (NWI), LiDAR imagery, GIS, and other available data will initially be used to identify and preliminarily characterize surface water resources, and to map and delineate wetlands and other habitat types and land cover. The preliminary list of surface waters will be examined relative to the study area, and the data will be reviewed and verified.

The field program for surface waters and wetlands will focus on the following needs within the study area:

- Identifying and characterizing all perennial streams and other waters of the U.S as defined in 33 CFR 328 and 40 CFR 230.41, and all special aquatic sites (e.g., wetlands, riffle-pool complexes, mudflats, etc.) as defined in 40 CFR 230.40-230.45;
- Verifying or delineating and mapping the boundaries of these waters, i.e., the ordinary high water mark, high water line, and mean high water as applicable;
- Characterizing aquatic habitat at locations where the study corridor crosses streams by documenting features such as channel gradient, sinuosity, bank full width, depositional features, substrate, bank structure and stability, woody debris, vegetative cover, riparian condition, floodplain characteristics, temperature, velocity, dissolved oxygen, and ice condition;
- Verifying or identifying sensitive habitats (e.g., spawning and overwintering) and other areas of special significance or importance to fisheries;
- Verifying or identifying springs and areas of upwelling;
- Verifying or delineating wetland/upland boundaries and/or conducting wetland determinations in accordance with the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and Alaska Regional Supplement (USACE 2007) at representative, unique, and important wetlands within all ecoregions along the study area;
- As necessary, recording hydrologic and other data to facilitate significant nexus determinations for wetlands and other potential waters of the U.S.; and,
- Identifying all potable water intakes within three miles downstream of the proposed crossing and potential contaminated waters or sediments.

Additional surface water data will be gathered to identify areas where surface water and/or ice may be withdrawn for activities such as hydrostatic testing, and constructing ice roads and construction pads. Data collection will include lake bathymetry (to determine volume), stream discharge, and water quality (e.g., pH, specific conductance, dissolved oxygen, calcium carbonate, etc.). The study area for this field data collection may extend greater than five miles from the pipeline routes and areas of other project features, but will be limited to those areas where ice and surface water are identified as potentially necessary.

The field program for groundwater use and quality will be limited to verifying and identifying groundwater supply wells and springs in the study area, which will extend greater than 150 feet from potential locations of any project footprint, including the construction right-of-way, access roads, staging areas, and ancillary features such as compressor stations and material sources. Field surveys will focus in areas where water supply wells and springs are known or suspected to be present, e.g., Glennallen, Northway, Dot Lake, Tok, Delta Junction, Fairbanks, Valdez, and rural residential areas.

3.2 Fish, Wildlife, and Vegetation

3.2.1 Fish

Fish surveys will be conducted in consultation with ADF&G for selected streams to verify or document fish presence and record species, habitat use, and other data. Surveys will also be conducted in certain streams, habitats, or specific locations to verify or document any overwintering use. The study area will include the project routes, and potential locations for the GTP, compressor stations, staging areas, materials sources, and other ancillary project features. It will also include those lakes and streams identified as potential sources of water and/or ice. Fish surveys will be conducted using standard accepted protocols for electro-fishing, seining, and trapping, as applicable to site conditions and other factors.

3.2.2 Vegetation and Wildlife

Aerial photos, topographic maps, NWI, LiDAR imagery, GIS, and other available data will be initially used to identify, map and delineate land cover and vegetative communities (habitats). This effort will include known and potentially suitable habitats for listed and proposed endangered and threatened species and for other species of concern (e.g., sensitive, unique), as well as proposed and designated critical habitats for listed endangered and threatened species. The study area may extend beyond a pipeline route, and potential sites for the GTP, compressor stations, and other ancillary features of the project; it may be broader in some areas based on the potential for disturbance and other effects to certain wildlife species.

The field program will entail habitat sampling to verify, identify, and describe the vegetation, community, and habitat attributes in important and representative habitats within all ecoregions in the study area. Using standard vegetation and habitat sampling protocols, quantitative data will be collected for biological parameters (e.g., vegetation composition and structure, species abundance and diversity, canopy closure, stem density, substrate type, slope, aspect, etc.) that will facilitate characterization of the major land covers and habitats using a classification system such as Viereck et al. (1992). Sensitive and other important habitats (e.g., denning, nesting, calving, migration, etc.) and special habitat features (e.g., rock outcrops, cliffs, springs, avalanche chutes) will be verified, characterized, and mapped.

Known and potentially suitable habitat for listed and proposed threatened and endangered species will be characterized relative to the species' important and critical habitat components. Site- and species-specific field surveys or inventories may be conducted for spectacled eider, Steller's eider, yellow-billed loon, raptors, marine mammals, Dall sheep, and other wildlife species. The need and scheduling of any surveys or inventories would be based on habitat use, species behavior, protocols, temporal validity of results, early agency consultation, and other considerations.

3.3 Cultural Resources

In consultation with the ADNR Office of History and Archaeology (i.e., the State Historic Preservation Office [SHPO]), FERC, and BLM, the Area of Potential Effect will be delineated. Alaska Native groups will be consulted on all field research plans.

Field activities will include an initial site survey in the Area of Potential Effect to verify and document the location of previously identified sites, and to identify any new sites. This may include shovel test, probe survey, or deep coring, as appropriate.

All work will be undertaken in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation for identification and documentation (48 FR 44720-44726), and by qualified professionals as described in 36 CFR 61.

3.4 Socioeconomics

Field data collection is not anticipated to be necessary to compile the outstanding information pertaining to employment, housing, government services, transportation, business, subsistence, fiscal condition, health, traditional knowledge, and other socioeconomic considerations. However, investigative methods such as inquiries and interviews may be necessary to determine historic and current socioeconomic conditions.

3.5 Soils

It will be necessary to request unpublished soils information from the Natural Resources Conservation Service (NRCS), BLM, DNR, and others. It will also be necessary to examine the available data for the study area considering engineering and construction information. There will be limited terrestrial field data collection needs specific to soils. Field activities are expected to be limited to examining surface soils to describe horizon thickness, color, texture, particle size and distribution, structure, and other physical parameters.

Sediment samples will be collected from offshore areas that may be subject to dredging or to disposal of dredged materials.

Reconnaissance level field surveys in the study area will examine and document present and historic potential for soil, sediment, or ground water contamination (e.g. use of hazardous substances or petroleum products).

3.6 Geological Resources

Field surveys to identify potential paleontological resources in the study area will be completed in conjunction with the archaeological field surveys. A field program specific to the remaining data requirements for Resource Report 6 is not anticipated. However, geotechnical and geophysical surveys for engineering needs are anticipated.

3.7 Land Use, Recreation and Aesthetics

Land use will be verified or characterized as part of the land cover and habitat survey effort. Interviews and meetings with the BLM, North Slope Borough, Fairbanks North Star Borough, and others are expected to be necessary to identify planned residential or commercial/business development; to ascertain or verify the management and use of public lands under their jurisdiction; to identify and delineate subsistence uses and subsistence use areas; to document or verify aesthetic resource values; or to obtain unpublished records and other data. A field data collection effort specific to meeting the requirements for Resource Report 8 is not anticipated.

3.8 Air Quality

Air monitoring stations will be installed and operated to collect baseline meteorological and ambient air quality data. The location and number of monitoring stations will be determined in consultation with the Alaska Department of Environmental Conservation, Division of Air Quality, and will be based on potential sites for the GTP and compressor stations.

3.9 Noise

Noise sensitive areas (NSAs) will be identified in proximity to the GTP, compressor stations, pipeline route, and ancillary project features. Ambient sound levels at these NSAs will initially be estimated based on current land uses, and may subsequently be measured at locations where there is a potential for noise from project construction or operation to affect NSAs, or to affect endangered, threatened, or other sensitive wildlife.

3.10 Logistics and Field Operations

The route for the pipeline from Point Thomson to the U.S./Canada Border would extend nearly 800 miles; the route to Valdez for an LNG option would extend nearly 860 miles. The field program would be staged and orchestrated based on broad work spreads, which would be dependent upon terrain, ecoregion, potential field office and field camp locations, travel, communications, medical facilities, fuel, supplies, and ground and air transportation facilities. Final selection and scheduling of the work spreads will be based on land access.

All field activities will be coordinated with the Alaska Pipeline Project Stakeholder Engagement Team. Alaska Natives, residents, landowners, and other stakeholders along the routes will be contacted and advised of the field activities. No field activities will occur on private property unless permission for access and specific field surveys has been granted.

Field offices will be established to serve as the communication, coordination, and logistical link between the field and project offices as appropriate. These field offices will provide logistical and other support to field

crews and the facilities will be used for staging personnel, and managing and storing equipment and supplies. Field offices may be established in Deadhorse, Fairbanks, Tok, and Valdez as necessary for field activities in the broader areas. In these communities, lodging, air and ground transportation, communications, medical, and other services and infrastructure are available. Field camps will be necessary, due to the limited availability of services along the length of the project routes. Where available, local accommodations will be used; camping will be necessary in some areas.

Field operations will be supported by a combination of motor vehicles, all-terrain vehicles, snow machines, and commercial or charter aviation (helicopters and fixed-wing aircraft). Commercial aviation is limited to the major communities of Anchorage, Fairbanks, Deadhorse, and Valdez. Helicopters would be used to expedite certain field studies and where access is constrained by terrain, vegetation, water bodies, land ownership, or lack of roads or trails.

Infrastructure for telecommunications is limited in much of rural Alaska. Local land-line telephone service is available in many communities, but cellular telephone service is limited to Fairbanks, Deadhorse, Valdez, some areas along the Richardson Highway and the Alaska Highway near Tok. Cell service is generally absent between Fairbanks and Deadhorse, and between Delta Junction and Valdez. Satellite phones and VHF radios will be necessary in these areas.

3.11 Schedule

Field studies will occur during the 2010-2011 timeframe and a detailed field program schedule will be developed as part of the final field program execution planning. Planning will include discussions with agency representatives to confer on issues such as the survey width, discipline specific survey protocols and data quality objectives, and schedule milestones.

In order to commence field activities in 2010, the following pre-field activities are anticipated within the schedule identified in Table 3.1.

Table 3-1. Schedule for completion of pre-field activities.

Task	Target Date
Initiate agency discussions aimed at identifying the survey corridor and survey expectations, developing discipline specific survey protocols and data quality objectives.	March 2010
Determine Land Ownership and Status along survey corridor.	May 2010
Complete agency discussions defining field program details (e.g., discipline-specific survey protocols, data quality objectives, study design)	May 2010
Procure all appropriate sub-contractors for specific disciplines (e.g., fisheries, vegetation, cultural resources, etc.).	May 2010
Begin submitting applications for Federal, State, Borough and other field study permits.	April 2010
Complete job safety and hazard analyses, emergency response planning, and Health and Safety Plan.	May 2010
Complete program operations plan that will include communications, logistics, field protocols, standards, practices, and data management.	June 2010
Receive Federal, State, and Borough Permits.	June 2010

The target timeframes for conducting the environmental field program are shown in Table 3.2. These are preliminary and subject to change as planning matures.

Table 3-2. Alaska Pipeline Project Environmental Field Schedule - Preliminary

Task	2010	2011
Waterbody Crossings: Hydrology, Fish Surveys and Habitat Inventories	June – September	June – September
Waterbody Crossings: Fish Surveys, Stream Overwintering Habitats	–	February – March
Potential Water Sources: Fish Surveys and Lake Bathymetry Surveys	July – September	June – September
Cultural Resource Surveys	July – September	June – September
Wetland Determinations and Delineations; Vegetation and Habitat Data Collection; Invasive Plant Surveys	July – September	June – September
Steller’s Eider, Spectacled Eider, and Yellow-billed loon Surveys	June	June
Other Wildlife Surveys	August – September	June – September
Ambient Air Quality and Meteorological Monitoring	August – December	January – December
Contaminated Site Evaluations	August – September	August – September
Marine Dredge Sampling and Soil Surveys	–	August