EA-03-009

BLM Serial Nos. AA-5847 and FF-12505

Environmental Assessment of the Proposed Reconfiguration of the Trans-Alaska Pipeline System

January 2004

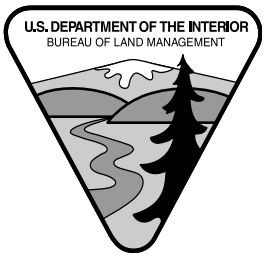
U.S. Department of the Interior – Bureau of Land Management

EA-03-009
BLM Serial Nos. AA-5847 and FF-12505

Environmental Assessment of the Proposed Reconfiguration of the Trans-Alaska Pipeline System

U.S. Department of the Interior
Bureau of Land Management

January 2004



EXECUTIVE SUMMARY

This environmental assessment (EA) of the proposed reconfiguration of the Trans-Alaska Pipeline System (TAPS) discusses the potential environmental effects of strategic reconfiguration of the pump stations for the TAPS. Alyeska Pipeline Service Company (APSC), as operator of the TAPS, and the TAPS Owners are considering several changes to the current pump station configurations to allow the flexibility to adapt to changes in crude oil transportation through the TAPS and throughput decline, technological improvements, and optimization of support infrastructure and resource utilization. The *Final Environmental Impact Statement for the Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way* (TAPS FEIS) discusses the impacts of operations of the TAPS as currently configured. It also discusses impacting factors associated with potential upgrades, such as the pump station reconfigurations, in Section 4.2.2.6. The TAPS FEIS concluded that there were no probable significant adverse environmental impacts from TAPS Right-of-Way (ROW) reauthorization (including reconfiguration of the pump stations) and the continued operation of the TAPS for an additional 30 years. This EA expands on the information presented in the TAPS FEIS, as more detailed information on the reconfiguration has become available.

This EA has been prepared to identify and evaluate the probable environmental impacts of the TAPS reconfiguration project. The project would occur entirely within the established TAPS ROW, for which the original Federal Grant and State Lease were recently extended for a second 30-year period. The probable environmental impacts of the TAPS ROW renewal were analyzed in the TAPS FEIS, which provides a thorough and recent environmental analysis. Therefore, this EA incorporates by reference relevant sections of the FEIS.

The proposed reconfiguration of the TAPS pump stations is described herein with assumptions current as of January 2004. Reconfiguration of the TAPS pump stations would consist of installation of new equipment and facilities (including replacement of the turbine-driven mainline pumps with electric-driven mainline pumps), new on-site electric power generation facilities (or use of commercially available electric power), and greater automation through upgrades to the electrical and control systems. The operations of the reconfigured TAPS would include the implementation of a regional center concept for maintenance and oil spill response.

Impacts associated with the installation and modification of equipment on the existing pump stations would be predominantly negative, but short-term and local. Short-term, minor air quality and soils impacts would occur because of fugitive dust emissions from earth disturbances and transportation. Other short-term and minor impacts associated with pump station reconfiguration would include increases in water use, wastewater generation, noise, and hazardous and domestic waste production. Because of the localized nature of the activities on an already developed site and the short duration of the activities, fish and threatened and endangered species would not be impacted. Birds and mammals using the pump stations as habitat would be disturbed during construction activities. Impacts on subsistence resources would be negligible, as no new access or roadways would be needed. Cultural resources and land use would not be affected. Short-term slight increases in impacts on visual resources may occur

during reconfiguration activities. Delivery of equipment, transportation of the workforce, and removal of wastes would have a minor and short-term impact on traffic on adjacent highways. Short-term positive socioeconomic impacts would occur as more jobs would be needed during installation and modification of equipment, and during transition.

In general, the operation of the new equipment after reconfiguration would reduce overall environmental impacts of continued operation. Air emissions would be reduced, leading to air quality improvements. A reduction in requirements for liquid turbine fuel delivered by truck would likely reduce the risk of spills associated with such delivery and would also reduce traffic volumes of heavy-duty commercial vehicles. In addition, no appreciable impacts to vegetation or biological resources would occur. The economic impacts of reconfiguration would be minor, with some redistribution or decrease in workforce, leading to changes in state employment of less than 0.5%. Hiring of Alaska Native workers would continue in the agreed-to proportions. Operation of the reconfigured pipeline on subsistence resource use would likely be negligible.

Finally, amendments have been made to the *Trans-Alaska Pipeline System Pipeline Oil Discharge Prevention and Contingency Plan.* APSC submitted amendments to the plan to the Alaska Department of Environmental Conservation and the Joint Pipeline Office on July 1, 2003, and the amendments were approved on December 31, 2003. The plan is a critical element to reconfiguration of the pipeline system.

CONTENTS

CONTENTS (Cont.)

FIGURES

TABLES

NOTATION

The following is a list of the acronyms, initialisms, and abbreviations (including units of measure) used in this document.

ACRONYMS, INITIALISMS, AND ABBREVIATIONS

AADT	annual average daily traffic
ADEC	Alaska Department of Environmental Conservation
APSC	Alyeska Pipeline Service Company
BLM	Bureau of Land Management
BWT	ballast water treatment
CEQ	Council on Environmental Quality
CO	carbon monoxide
DRA	drag reducing agent
EA	environmental assessment
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEIS	final environmental impact statement
IMT	Incident Management Team
IR	infrared
JPO	Joint Pipeline Office
MCCF	mobile contingency camp facility
MOC	Management of Change
MP	milepost
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NHPA	National Historic Preservation Act
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
O&M	operation and maintenance
OCC	Operations Control Center

PM_{10}	particulate matter with a mean aerodynamic diameter of 10 µm or less
PS	pump station(s)
PSD	Prevention of Significant Deterioration
RMP	Resource Management Plan
ROW	right-of-way
SCADA	supervisory control and data acquisition
SHPO	State Historic Preservation Office(r)
SO_2	sulfur dioxide
SWPPP	Storm Water Pollution Prevention Plan
TAPS	Trans-Alaska Pipeline System
VFD	variable frequency drive
VHF	very high frequency
VMT	Valdez Marine Terminal
WSR	Wild and Scenic River

UNITS OF MEASURE

bbl	barrel(s)	m^3	cubic meter(s)
d	day(s)	mi	mile(s)
dBA	A-weighted decibel(s)	mi^2	square mile(s)
ft	foot(feet)	min	minute(s)
gal	gallon(s)	MW	megawatt(s)
hp	horsepower	rpm	revolution(s) per minute
in.	inch(es)	yr	year(s)
kW	kilowatt(s)	µg	microgram(s)

1 PURPOSE AND NEED

1.1 INTRODUCTION

This environmental assessment (EA) of the proposed reconfiguration of the Trans-Alaska Pipeline System (TAPS) discusses the potential environmental effects of strategic reconfiguration of the pump stations for the TAPS. Alyeska Pipeline Service Company (APSC), as operator of the TAPS, and the TAPS Owners are considering several changes to pump station configurations to allow the flexibility to adapt to changes in crude oil transportation through the TAPS and decline in throughput, improvements in technology, and optimization of support infrastructure and resource utilization. To help define the potential future upgrades to the TAPS, APSC has completed a conceptual engineering review to evaluate opportunities for simplifying and reducing the overall TAPS infrastructure. The possible changes are primarily limited to the pump stations' infrastructures and would include the installation of new equipment and facilities (including the replacement of turbine-driven mainline pumps with electric-driven mainline pumps), new on-site electric power generation facilities (or use of commercially available electric power), and greater automation through upgrades to the electrical and control systems. Existing infrastructure would remain, providing backup capacity. No changes are anticipated for the pipeline itself outside the pump stations' boundaries. Finally, amendments have been made to the *Trans-Alaska Pipeline System Pipeline Oil Discharge Prevention and Contingency Plan* (C-Plan) (TAPS Owners 2003a, 2003b). APSC submitted amendments to the C-Plan to the Alaska Department of Environmental Conservation (ADEC) and the Joint Pipeline Office (JPO) on July 1, 2003. The amendments were approved December 31, 2003.

In 2002, the U.S. Department of Interior, Bureau of Land Management (BLM) completed a Final Environmental Impact Statement (FEIS) that identified and analyzed the probable direct, indirect, and cumulative environmental impacts associated with renewal of the TAPS Right-of-Way (ROW). The FEIS (BLM 2002) stated that there were no probable significant adverse environmental impacts from TAPS ROW authorization and continued operation (including reconfiguration of the pump stations) for an additional 30 years. This EA expands on the information presented in the TAPS FEIS, as more detailed information on the reconfiguration has become available. The proposed reconfiguration of the TAPS pump stations is described herein with assumptions current as of January 2004.

1.2 PURPOSE AND NEED

The purpose of strategic reconfiguration is the continued improvement of the operation and maintenance (O&M) of the TAPS. Reconfiguration would simplify and streamline O&M, thus reducing overall costs of operation and extending the life of the pipeline. The need for the project is to help Alaska North Slope crude remain competitive in a world market. The trade in crude oil as an international commodity, and the relatively recent opening of several other supplies (such as those in Russia), have increased the demand for economic efficiencies worldwide. Searching for ways to reduce transportation costs is one step that can be taken to keep Alaska North Slope oil production competitive on the worldwide market. It is also in the

nation's best interest to keep domestic oil production competitive, thus reducing the dependence on foreign imports.

1.3 RELATIONSHIP TO THE TAPS ENVIRONMENTAL IMPACT STATEMENT

The *Final Environmental Impact Statement for the Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way* (TAPS FEIS) (BLM 2002)[1] discussed the impacts of current operations of the TAPS for the renewal period of 30 years. In Section 4.2.2.6, it also discussed the impacting factors associated with planned and potential upgrades. Planned upgrades were considered in the assessment of impacts of the TAPS for the renewal period.

This EA on strategic reconfiguration of the pump stations expands on the information presented in the TAPS FEIS. The EA is based primarily on information presented in the *Environmental Report for the Trans-Alaska Pipeline System Right-of-Way Renewal* (TAPS Owners 2001), as updated during the renewal process, and on the BLM's TAPS FEIS (BLM 2002). Where appropriate, this EA briefly summarizes the information in these documents and otherwise incorporates by reference the relevant analysis and conclusions in order to avoid duplication. The level of confidence in identifying the probable environmental impacts is reasonable because (1) the project under analysis is only a component piece of normal TAPS O&M, which already exists with known, observable impacts; (2) all of the proposed reconfiguration activities would occur within the dedicated TAPS ROW; (3) most aspects of the reconfiguration would only affect operations within structures; and (4) the long-term effects on the environment from the planned upgrades would largely be beneficial. As further plans have been developed for upgrades and modifications, more detailed information has become available.

1.4 ASSUMPTIONS

This EA assesses potential impacts associated with strategic reconfiguration as envisioned in January 2004. It is important to note that the potential upgrade of the TAPS pump station facilities is an ongoing process. The final design of the upgrades has not been fully determined or approved by oversight authorities. Information presented encompasses the range of probable upgrade activities and highlights changes that are likely to occur. If there are substantial changes in the proposed action, requiring additional new surface occupancy or disturbance, further environmental analysis may be necessary.

This EA is based primarily on the information presented in the TAPS FEIS. Other information, including the current project description, was provided by the TAPS Reconfiguration Team and is included in the reference list (Section 5). Other documents reviewed are also listed in the references section.

---

1 Available at http://tapseis.anl.gov/documents/eis/index.cfm.

2 PROPOSED ACTION AND ALTERNATIVES

Two alternatives are evaluated in this EA: the proposed action, that is, reconfiguration of the TAPS, and no action. The reader is directed to the TAPS FEIS (BLM 2002) for a thorough description of the TAPS as currently configured and the environmental impacts of operations and maintenance of the TAPS in its current configuration.

The reconfiguration of the TAPS as currently envisioned modifies the pump stations' infrastructures but does not modify the mainline pipe outside the pump stations' boundaries. Therefore, the description that follows focuses on the pump stations and their corresponding infrastructures.

2.1 DESCRIPTION OF THE PROPOSED ACTION

As the result of declining production of oil from the Prudhoe Bay Oil Field and advances in pipeline technology since the construction of the TAPS, in 2002, APSC identified potential upgrades and reconfigurations to the pipeline that would give it flexibility to operate and maintain the pipeline more efficiently. The primary focus of the TAPS reconfiguration upgrades would include installation of improved power and pump systems at pump stations; automation of pump station control activities; improved voice and data communications systems; unmanned pump stations and remote security devices; and use of a regional center concept for maintenance and oil spill response. Although there may be future facility changes at the Valdez Marine Terminal (VMT), any changes at the VMT are separate activities from the pump station reconfiguration and there are no interdependencies between these efforts. Therefore, this EA does not include analysis of the VMT.

The activities necessary to implement this reconfiguration are divided into two phases for the purposes of impact assessment. The first phase, a construction phase, would consist of the installation of the reconfigured units. During this phase, modular units would be installed that would replace existing facilities. During this first phase, some components of the pump stations that are not critical to the operation of the existing facilities may be removed to facilitate installation or modification of equipment. At all times during the construction phase, the existing facilities would be in full operation as described in the TAPS FEIS. The second phase would be the transition and operations phase. During this phase, the reconfigured pump stations would become fully operational. The operation of the reconfigured TAPS would include the implementation of a regional center concept for maintenance and oil spill response, a critical element to the completion of any reconfiguration of the pipeline system.

2.1.1 Existing APSC Facilities

The TAPS consists of 800 mi of pipeline, 11 pump stations, the VMT, and associated facilities (Table 1; Figure 1). The TAPS was originally designed for 12 pump stations. However,

TABLE 1 Summary of Major Features of the Trans-Alaska Pipeline System

Component	Type	Data
Area covered by the TAPS	NA[a]	16.3 mi^2 (includes VMT)
Length of pipeline	NA	800 mi
Design mode	Aboveground	420 mi
	Conventional belowground	376 mi
	Refrigerated belowground	4 mi
Typical right-of-way width	Federal lands, buried pipe	54 ft
	Federal lands, elevated pipe	64 ft
	State lands	100 ft
	Private lands	54 to 300 ft
Vertical support members	Number	78,000
	Types	16 for different soil and permafrost conditions
	Diameter	18 in.
	Number with heat pipes	61,000
	Depth embedded	15 to 70 ft
Animal crossings	Elevated	554
	Buried	23
	Buried (refrigerated)	2 (Mileposts 645 and 649)
Bridges	Orthotropic box girder	1 (Yukon River, shared with Alaska Department of Transportation)
	Plate girder	9 (Atigun, Dietrich, Koyukuk [south and middle forks], Hammond, and Tatalina Rivers; Unnamed, Hess, and Shaw Creeks)
	Suspension	2 (Tanana and Tazlina Rivers)
	Tied arch	1 (Gulkana River)
Pump stations	Operating (1999)	PS 1, PS 3, PS 4, PS 7, PS 9, PS 12
	Standby	PS 2, PS 6, PS 8, PS 10
	Relief	PS 5
Pipeline valves	Check valves	81
	Gate valves	95 (including pump station isolation valves)
	Ball valves	1
Fuel gas line	Buried natural gas pipeline	From PS 1 to PS 3 and PS 4; 8 to 10 in. diameter; approximately 144 mi long
Access roads		Approximately 284 secondary roads (from 120 ft to 7.5 mi long) linking state roads with pipeline, pump stations, material sites, disposal sites, and airfields
Valdez Marine Terminal	Total area	1,000 acres
	Crude oil storage	9.18 million bbl total in 18 tanks (510,000 bbl each)
	Tanker berths	4 (1 floating, 3 fixed platform)

TABLE 1 (Cont.)

Component	Type	Data
Ship Escort/Response Vessel System (SERVS)	Tugs	2 enhanced tractor tugs, 3 prevention/ response tugs, 4 other
	Other vessels	10 workboats, 7 response barges, 48 mini-barges
	Skimmers	More than 70
	Containment boom	More than 42 mi
	Response centers	5 (Valdez, Cordova, Whittier, Chenega Bay, Tatitlek)
Communications sites	Microwave stations	42 (operated by AT&T)
	Satellite earth stations	7 (operated by AT&T)
	VHF repeaters	22

[a] NA = not applicable.

Source: BLM (2002) (Modified from TAPS Owners [2001, Table 2.1-1]).

FIGURE 1 Map of the Trans-Alaska Pipeline System

because of the advent of drag reducing agent (DRA) prior to the construction of all 12 pump stations, Pump Station (PS) 11 was never constructed. DRA reduces the amount of horsepower needed to pump oil through the pipeline. The 11 pump stations along the TAPS are spaced at intervals of approximately 50 to 100 mi. PS 5 does not have mainline pumps; its primary purpose is to operate as a pressure relief station for the oil that flows down the south side of Atigun Pass.

All the pump stations are of similar layout and function, although there are certain differences due to location and station tasks. The stations include mainline pumps and turbine drivers (except PS 5), isolation valves, relief tanks, fuel handling facilities, station and pipeline control facilities, living quarters (except PS 1, 8, and 9), office buildings, shops/warehouses, and oil spill equipment buildings and other facilities for O&M. All pump stations are protected by a 24-hour security force and perimeter fences. Currently PS 1, 3, 4, 5, 7, 9, and 12 are operational. PS 2, 6, 8, and 10 were placed in nonoperational mode in 1996 and 1997 because of declining throughput. Table 2 outlines the major features at each station, and Figure 2 shows the layout of PS 1.

Turbines at PS 1, 3, and 4 are powered by natural gas that is piped to each station from Prudhoe Bay. Turbines at the other pump stations are powered with liquid turbine fuel that is commercially trucked to each station.

In normal operating mode, most pump station operations are controlled from the Operations Control Center (OCC) in Valdez. However, if required, the operations of each station can be controlled locally from the pump station. PS 1, at Prudhoe Bay, also has the capability to

TABLE 2 Pre-reconfiguration of Trans-Alaska Pipeline System Pump Stations Summary[a]

Pump Station	Location (MP)	Elevation (ft)	Crude Tank Capacity (bbl)	Living Quarters (Y/N)[b]	No. of Mainline Pumps	Turbine Fuel Capacity (bbl)	Crude Oil Topping Unit (Y/N)	Refrigerated Foundation (Y/N)	Significant Features
PS 1	0	39	420,000	N	3	10,000	N	Y	Meters; pig launcher
PS 2	58	602	55,000	Y	2	798	N	Y	Standby
PS 3	104	1,383	55,000	Y	3	20,000	N	Y	None
PS 4	144	2,763	55,000	Y	3	20,000	N	N	Pig receiver/ launcher
PS 5	275	1,066	150,000	Y	0	20,000	N	Y	Pressure relief station
PS 6	355	881	55,000	Y	3	40,000	Y	Y	Standby
PS 7	414	904	55,000	Y	2	40,000	N	N	None
PS 8	489	1,028	55,000	N	3	40,000	Y	N	Standby
PS 9	549	1,509	55,000	N	3	40,000	N	N	None
PS 10	586	2,392	55,000	Y	3	40,000	Y	N	Standby
PS 12	735	1,821	55,000	Y	3	40,000	N	N	None

[a] PS 11 was never built.

[b] Y = yes; N = no.

Source: TAPS Owners (2001).

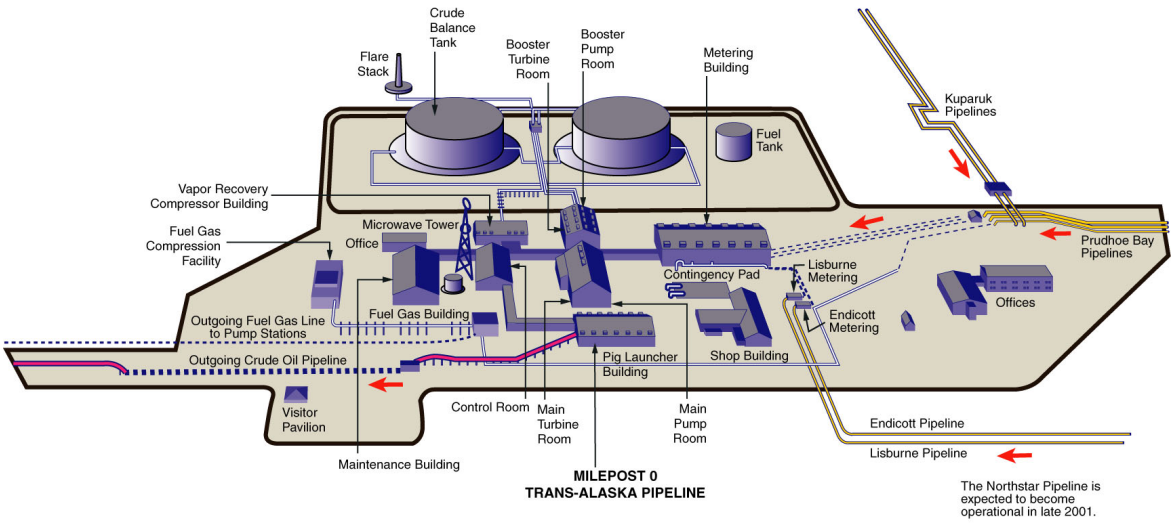


FIGURE 2 Existing Layout of Pump Station One (TAPS Owners 2001)

control systemwide operations. All critical station equipment is fully automatic, with manual override capability.

2.1.2 Proposed Reconfiguration

The proposed TAPS reconfiguration primarily consists of electrification of the mainline pumps and automation of the pump stations. It does not change the overall footprint of the pump stations or pipeline system. It seeks to simplify the operations at each station, increase the efficiency of operations, minimize the need for on-site personnel, and reduce the amount of fuel used at each station. If personnel reductions are realized, there would be a corresponding reduction in the use of water and the production of wastewater and solid waste. Solid waste typically is disposed of through incineration and/or landfilling, and, with a reduction in personnel, this waste stream would be reduced. A regional center concept for maintenance and oil spill response would be implemented.

Table 3 summarizes the preferred changes at each pump station.

2.1.2.1 Pump Station Electrification

The electrification component of the project involves the replacement of the existing pumping units at PS 1, 3, 4, and 9 with new pumps that would be driven by electric motors. Power for the motors at PS 1 and 9 could be supplied from a tie-in to the local grid (preferred) or by on-site gas turbine electric-power generators. Power for the motors at PS 3 and 4 would be provided by on-site gas turbine electric-power generators. Key features of the new pump station design include:

TABLE 3 Summary of Preferred Upgrades at Each Pump Station

Facility	Pump Station Status after Reconfiguration	Power Source		Facilities	
		Existing	Upgraded	To Remain	To Be Upgraded
PS 1[a]	Operational in reconfigured mode	8 operating turbines 8 spare gas turbines	Electric motors. Tie-in to producer grid. One small spare power generation set and electric motors.	Many of the existing facilities would be taken out of operation.	Several of the existing buildings would be upgraded. New command, pump and power distribution modules.
PS 2	Decommissioned	In standby mode	2 small gas-fueled, reciprocating generators.	None remain operational.	New command module
PS 3	Operational in reconfigured mode	5 operation gas turbines 2 spare gas turbines	Electric motors with new gas turbines/ generators.	Main piping manifold, gas building, relief system, and booster pump remain operational.	New command, pump, and power distribution modules.
PS 4	Operational in reconfigured mode	4 operating gas turbines 3 spare gas turbines	Electric motors with 2 new gas turbines/ generators.	Most remain operational.	New command, pump, and power distribution modules.
PS 5	Operational in reconfigured mode	1 operating liquid fuel turbine 3 spare liquid fuel turbines	Two new reciprocating liquid fuel generators. 1 backup generator set.	Most remain operational, 2 existing booster turbines for cold restart.	New command module, 1 new electric-motor-driven booster/ injection pump.
PS 6	Decommissioned	In standby mode	In standby mode, 2 small liquid-fueled reciprocating generators.	None remain operational.	New command module.
PS 7[b]	Unchanged, likely decommissioned between 2005 and 2013	2 operating liquid fuel turbines 2 spare liquid fuel turbines	No changes.	Most remain operational until decommissioning.	New command module.
PS 8	Decommissioned	In standby mode	In standby mode, 2 small liquid-fueled reciprocating generators.	None remain operational.	New command module.

TABLE 3 (Cont.)

Facility	Pump Station Status after Reconfiguration	Power Source		Facilities	
		Existing	Upgraded	To Remain	To Be Upgraded
PS 9[c]	Operational in reconfigured mode	2 operating liquid fuel turbines 2 spare liquid fuel turbines	Tie-in to commercial power with small standby power backup. Electric driven pumps.	Main piping manifold, relief system, and booster pump remain operational.	New command, pump and power distribution modules.
PS 10	Decommissioned	In standby mode	In standby mode, 2 small liquid-fueled reciprocating generators.	None remain operational.	New command module.
PS 12	Decommissioned	Commercial power. 1 operating liquid fuel turbine 4 spare liquid fuel turbines	In standby mode, 2 small liquid-fueled reciprocating generators.	Main piping manifold, relief system, and booster pump remain operational.	New command module.

[a] Another option for PS 1 is the installation of on-site gas turbine electric-power generators.

[b] Other options for PS 7 include placing the station on warm standby; changing the controllers, only; or fully automating the station with two power options.

[c] Another option for PS 9 is the installation of on-site gas turbine electric-power generators.

- Unmanned, remotely controlled operation;
- A common pump and motor size at each pump station arranged in a 3,3,3,3[2] parallel configuration at PS 1, 3, 4, and 9, respectively;
- Unit sizing such as to provide the capability of increasing or downsizing pipeline capacity in the range of 1.5 to 0.3 million bbl/d by the addition or removal of pump units;
- Variable frequency drive (VFD) control of pumps and motors; and
- Modular design of new facilities.

As a result of the conversion of the pump stations to unmanned operation, existing facilities could either be maintained to provide backup capabilities or be allowed to go cold. This

2 A 3,3,3,3 configuration indicates that three pump modules would be included at each of the four locations.

would in turn permit the decommissioning of existing heating and refrigeration facilities and their replacement in some cases by significantly smaller-sized facilities.

2.1.2.2 Control System Automation

The automation component of the project provides overall automation of the stations in concert with an upgraded Supervisory Control and Data Acquisition (SCADA) system. This requires reconnection of all facilities that would remain at the pump stations after completion of electrification.

New electrical load centers and communications modules would be installed. New power and instrument cabling would be installed to connect the remaining devices and equipment to the new load centers and communications module. The load centers and new facilities' modules would be connected to a site communications module that would provide the interface for the station controls and communication. Backup power generation capability would be installed to maintain a minimum flow of crude oil in the event of main power interruption.

The pump stations can be grouped as follows:

- Electrification sites (PS 1, 3, 4, and 9);
- Rampdown sites, where no pumping or relief facilities are required (PS 2, 6, 8, 10, 11, and 12);
- PS 5, the pressure relief site, where the existing facility functions would be upgraded for unmanned operation; and
- PS 7, where minimal changes may be made.[3]

Services required for retained buildings at the pump stations undergoing pump electrification would include heating systems, refrigeration systems, scraper launchers/receiver traps, and relief systems. A detailed review was conducted to determine how to reestablish and monitor these services. The operations of the scraper launchers/receiver traps and associated cleaning pigs and smart pigs would not change as a result of the reconfiguration.

2.1.2.3 Transition to Reconfigured Operations

A transition period would follow installation of the new equipment, when both older facilities and new facilities would be operational. During start-up of the new facilities, 31 people would be required from June 2005 through December 2005. During this time, they would move from PS 9 to PS 3, to PS 1 to PS 4.

---

[3] As of January 2004, it had not yet been decided whether PS 7 would remain in operation and undergo upgrading. PS 7 would be needed if throughput were to exceed 1.4 million bbl/d.

APSC is developing a project-specific Management of Change (MOC) Plan for implementation of strategic reconfiguration. This plan will follow the guidelines in the APSC Quality Program Manual (QA-36) and the APSC Principal Implementing Procedures based on that manual. The plan will address steps necessary to minimize risks associated with nonroutine operations during the transition phase from construction to operations. A Transition Management organization has been established to manage MOC, management systems, and organizational readiness.

After the transition period, some of the older facilities would no longer be required for pump station operation; they would either be maintained to provide backup service or be decommissioned. The workforce at the pump stations would decline. There are no plans at this time to remove unused facilities; such an action would require further environmental evaluation in accordance with the National Environmental Policy Act (NEPA).

2.1.2.4 Use of the Maintenance and Regional Center Concept

With the exception of PS 1, pump stations would be unmanned and remotely operated. To provide personnel for routine maintenance activities and for oil spill response, a regional center concept would be implemented. Response equipment would be stored at the automated pump stations as well as at the maintenance and response centers. Equipment would also be strategically prepositioned at several locations along the pipeline. See Section 4.1.2 Oil Spill Response under Reconfiguration for more details.

Implementation of a regional center concept would include:

- Spill response and support personnel consolidation using planned response centers and existing community infrastructure to the extent practical;
- Maintenance and response centers planned for Prudhoe Bay/PS 1, PS 4, PS 5, Fairbanks, Glenallen, and Valdez; and
- Satellite bases for the Yukon and Delta River areas.

2.1.2.5 Description of New Equipment

Pump stations would have new equipment installed as a result of reconfiguration. Upgrades would include the installation of new control modules, new electric motors, new turbine generators, and new power distribution modules. All pump stations would have new communications modules installed, which are necessary for the automation of the pump stations.

The new equipment for the pump station upgrades is based on modular designs and would be constructed as prefabricated modules and transported to each pump station for assembly. Pump and motor units, electrical equipment, gas turbine generators, and interconnecting piping and cables would all be modularized.

Six primary module units would be assembled at each pump station.

1. Individual pump module,
2. Piping manifold module,
3. VFD module,
4. Switch gear module,
5. Load center module; and,
6. Communications module.

Valve engineering work during the postpreliminary engineering phase would investigate the opportunity to reduce total numbers of modules by combining the functions of the VFD module and switch gear module into one module.

The preferred configuration would be as follows. Each individual mainline pump system would consist of the pump module (which contains the electric motor and pump), the piping manifold module, and the VFD module. Pumps in each station would be arranged in a parallel configuration. There would be three units each in PS 1, 3, 4, and 9. Each pump and motor unit would be controlled through a VFD. The new units at each station (pump, motor, and VFD) would be sized identically, allowing use of common designs and minimization of capital spare parts requirements. A new power supply would be provided to PS 1 and PS 9 from tie-in to the local grid; alternatively on-site gas turbine electric-power generators could be installed. New power at PS 3 and 4 would be generated on site by gas turbine generators. Power and controls for remaining existing facilities on electrification sites and at rampdown sites would be rerouted to new load centers and a new communications module. The communications module would be connected to existing facilities through load centers that contain control equipment, motor controls, and power distribution equipment.

Each pump module would consist of a prefabricated steel modular structure that would be erected on piles or concrete pilasters approximately 5 ft from ground surface. The pump module would house both the mainline pump and electric motor. The pump would be a two-stage centrifugal pump that meets the specifications of the American Petroleum Institute (2003). The pump is capable of up to 7,500 hp input power. The electric drive motor would be rated at 6,500 hp, 1.15 service factor, 3,600 rpm, and would be capable of producing 7,475 hp continuously. The overall dimensions of the pump module are 40 ft long, 20 ft wide, and 15.5 ft tall.

The current leak and fire detection strategy for the pump modules includes seal leak detection utilizing either pressure switches, level switches on seal pots or flow sensors in seal drain lines, infrared (IR) gas detectors, and IR3 flame detectors. Each pump module would have a sump tank with a 2,000 to 2,500-gal capacity. Pump seal leaks would be contained and drained by drain lines to the sump tanks. Sump tank level detectors would also serve as a secondary means of detecting pump seal leaks.

The pump modules would be required to be designed for secondary containment in the event of a leak in the pump module. The pump modules would be ventilated through louvres and ridge vents. APSC proposes to grade the ground around the modules, with a slope away from the

module to minimize the quantity of combustibles in the event of a leak and/or fire. A berm would be constructed around the site to contain oil in the event of a leak. APSC has determined that the potential oil spill volume for each pump module would be on the order of 110 bbl. This is the total fluid volume between suction and discharge valves. The loops in both the suction and discharge piping limit the total volume that can be freely discharged at a single point. The sump volume is 50 bbl, and the sump capacity is 30 gal/min. The sump discharges directly through existing piping to the crude relief tank.

2.1.2.6 Removal of Existing Equipment

Each pump station would likely have some equipment removed to make way for new equipment. Some equipment may be salvaged for future use. All aboveground equipment to be removed would be removed to the existing grade. Equipment that cannot be recycled would be disposed of as wastes (see Section 4.1.1.16). Concrete or asphalt pads would only be removed at contaminated sites that require additional cleanup, otherwise they would be left in place. Known contaminated soil would be cleaned per ADEC guidelines. No gravel would be removed, except noted contaminated gravel, and the gravel pads would remain in place. Additional gravel may also be needed to backfill areas where depressions may be left as a result of removal of structures.

2.1.2.7 Maintenance of Remotely Operated Pump Stations after Transition

All new facilities would be housed in modules located on elevated foundations. Though access to each module would be limited, it would be adequate for O&M. Any major maintenance, such as a turbine change-out, would require roof removal or removal of an access panel and the use of a portable crane. All routine maintenance procedures for pumps, motors, turbines, generators, switchgear, breakers, controls, and auxiliary systems would be performed inside the enclosures. One unit can be undergoing maintenance without the shutdown of adjacent units. Snow management would be simplified by the design of the modules. The pile foundation design elevates the modules off the ground, allowing the wind to help keep snow from accumulating around the base. Steps and landings would be constructed from grating material to minimize snow buildup.

No change in maintenance or security crew requirements for PS 1, PS 2, PS 5, PS 6, PS 7, PS 8, PS 10, and PS 11 would occur. For the other pump stations, maintenance and security would be three round-trips per day for PS 3, one round-trip per day for PS 4 from a remote location, three round-trips per day from Fairbanks for PS 9, and two round-trips per day from Glenallen or Valdez.

2.2 DESCRIPTION OF NO ACTION

No action would be continued operation of the TAPS in its current configuration, as described in the TAPS FEIS (BLM 2002). For this alternative, maintenance and upgrades of

equipment would occur only as needed to maintain safety and reliability in accordance with the APSC Reliability Centered Maintenance strategy approved by the JPO.

3 AFFECTED ENVIRONMENT

Chapter 3 describes the existing environment of the TAPS. Where possible, information focuses on pump station locations, since reconfiguration affects the pump stations and adjacent areas, not the pipeline corridor.

Unless otherwise noted, all information regarding the affected environment is summarized from the TAPS FEIS (BLM 2002).

3.1 PHYSIOGRAPHY AND GEOLOGY

The TAPS ROW crosses a wide variety of terrains, including three mountain ranges, several intermontane basins, and an arctic coastal plain. Along the 800 mi of the TAPS ROW 10 physiographic provinces (regions in which the landforms are similar in geological structure and differ significantly from the landform patterns in adjacent regions) are crossed. The physiographic regions spanned by the pipeline are as follows: Arctic Coastal Plain, Arctic Foothills, Brooks Range, Chandalar Ridge and Lowland Section, Kokrine-Hodzana Highlands and Yukon-Tanana Uplands, Tanana Lowlands, Northern Foothills and Alaska Range, Gulkana Upland, Copper River Lowland, and the Chugach Mountains.

3.2 SOILS AND PERMAFROST

Soil and permafrost characteristics vary greatly along the TAPS ROW. Soil origins include weathered bedrock; glacial till and outwash; fluvial gravel, sand, silt, and clay; lacustrine silt and clay; colluvium; and windblown silt and fine sand. Soil conditions along the ROW were evaluated during the construction phase, and soils prone to liquefaction or landslides were avoided to the extent practicable.

Permafrost was found to exist along much of the ROW, ranging from regions with continuous permafrost (90 to 100% coverage) to regions with isolated patches (up to 10% coverage). The active layer, which undergoes seasonal freezing and thawing, can be found anywhere from 1 to 15 ft below ground surface.

Since the initial construction of the TAPS, there have been various changes in the soils and permafrost near pump stations. Mass wasting near the TAPS (e.g., avalanches, rock falls, and landslides) has caused pipeline stability concerns. Permafrost near PS 12 in the Chugach Mountain region, near the end of a section of isolated permafrost patches, has degraded since construction of the facility. Because the temperature of the workpad is warmer than the ground temperature, it is believed that the workpad promoted permafrost degradation, which increased meltwater and led to subsequent ponding around PS 12.

3.3 WATER RESOURCES

Freshwater is used at the pump stations to meet needs for potable water, industrial water, and hydrostatic testing. Potable water use at pump stations with living quarters averages 100 gal per person per day, while industrial water use is minimal, including such things as equipment washing and dust suppression. Hydrostatic testing requires a large volume of freshwater, but occurs infrequently.

Surface water withdrawal is regulated by the Alaska Department of Natural Resources, *Alaska Statute*, Title 41, and *Alaska Administrative Code*, Title 11, Chapter 93, and must be consistent with the Alaska Coastal Management Program for withdrawal within the coastal zone. APSC maintains certificates of appropriation for each pump station, with the exception of PS 1. Water for PS 1 is purchased through the North Slope Borough's Service Area 10 water utility. The borough's water is supplied from the Isatoak Reservoir, which provides a total of 200,000 gal/d. Of these 200,000 gal, approximately 4,500 to 7,500 gal are purchased for PS 1. Water is supplied to PS 6 by an off-site well. With the exceptions of PS 1 and 6, pump stations are supplied with potable water by local wells. Each pump station draws between 4,500 and 7,500 gal/d, the majority of which is for domestic use.

Discharges to surface water must be made in accordance with applicable state and federal permits. APSC maintains a linewide National Pollution Discharge Elimination System (NPDES) permit for discharge of sanitary wastewater, hydrostatic test waters, and excavation dewatering. Stormwater discharges from APSC material and construction sites are covered under existing general NPDES stormwater permits. Direct discharge to surface waters is uncommon; whenever possible, discharges are made to dry channels, tundra, or upland areas.

PS 3, 5, and 6 are the only pump stations with a discharge of sanitary wastewater. PS 1, 3, and 4 dispose of sanitary wastewater by stack injection (incineration and evaporation), and PS 7 through 12 use conventional septic treatment systems. Wastewater not stack-injected at PS 3 is treated by a rotating biological contactor. PS 5 and 6 use a conventional aerobic secondary treatment system using a small mechanically activated sludge plant; wastewater discharge is distributed through a small outfall.

3.4 ATMOSPHERIC ENVIRONMENT

Existing sources of emissions along the TAPS ROW can be classified as one of three types: stationary, mobile, and fugitive. Stationary sources include pipeline turbine and pump units, booster pumps, power generation turbines, process and space heaters, water pumps, incinerators, storage tanks, and open burning at facilities and along the pipeline. Mobile sources of emissions are the vehicles and equipment used at each pump station and along the TAPS ROW and constitute a small amount of the total emissions. Fugitive sources include road dust; dust from the operation of earthmoving equipment; and leaks or programmed releases of volatile constituents in fuels and crude oil from valves, fittings, or storage tank vents.

Each pump station is individually regulated with an air quality operating permit issued by the State of Alaska. In addition, some equipment at each pump station is subject to limits designed to ensure compliance with Prevention of Significant Deterioration (PSD) regulations. Regulated pollutants include criteria pollutants, ozone-depleting substances, and hazardous air pollutants. Infrequent unplanned releases of petroleum and chemicals also contribute to the total emissions generated at the pump stations.

Stationary sources are the largest contributors to emissions along the TAPS ROW. The estimated potential emissions for each pump station and the VMT are presented in Table 4. (Note: the VMT is not analyzed as part of this discussion). Monitored air quality data are available for areas in the vicinities of PS 1 and 8, while modeled data describe air quality for the remainder of the ROW. Table 5 presents air quality data associated with TAPS pump stations. There are two designated nonattainment areas for National Ambient Air Quality Standards (NAAQS) in the vicinity of the TAPS ROW; however, none of the TAPS ROW is located within either of these two areas.

3.5 NOISE

Anthropogenic noise sources at pump stations include pumps, compressors, electric generators, boilers, heaters, incinerators, flares, vehicles, and construction equipment. No data are available on noise levels within, or in the immediate vicinity of, pipeline facilities. The initial TAPS FEIS for construction of the pipeline made a conservative estimate of 74 dBA at a distance of 600 ft from a pump station. Noise regulations have not been established by either the State of Alaska or by any of the boroughs through which the TAPS ROW passes; however, the U.S. Environmental Protection Agency (EPA) recommends a threshold of an equivalent steady sound level of 70 dBA or less over a 40-year period. Noise from TAPS facilities is indistinguishable from background noise levels at residences and towns nearest the boundaries of TAPS facilities.

3.6 TERRESTRIAL VEGETATION AND WETLANDS

The TAPS ROW crosses through four major vegetation zones: lowland tundra, upland tundra, boreal forest, and coastal forest. Lowland tundra vegetation is found along the northernmost portion of the TAPS ROW within the Arctic Coastal Plain, from Milepost (MP) 0 to approximately MP 60. Vegetative communities present within the lowland tundra zone are predominantly wetland, and consist mainly of grasses, sedges, and mosses. Upland tundra vegetation occurs on the Brooks Range (MP 60 to MP 190), the Alaska Range (MP 550 to MP 610), and the Pacific Coastal Mountains (MP 720 to MP 780). Predominant vegetation in the upland tundra zone north of the Arctic Circle is tussock tundra, with dry tundra and ericaceous shrub tundra the most frequently occurring communities above the treeline in mountain areas. Near the treeline in the Alaska Range and the Brooks Range, shrubland communities are extensive. Boreal forest vegetation is found along the TAPS ROW in the interior region to the northern forest limits on the Copper Plateau (MP 190 to MP 550) and between the Alaska Range

TABLE 4 Estimated Potential Emissions of Criteria Pollutants from Existing TAPS Facility Sources[a]

TAPS Facility	Annual Emission Rate (tons/yr)					
	SO_2	NO_x	CO	PM_{10}	Pb	VOCs
PS 1	39	771	543	120	–[b]	28
PS 2[c]	12	608	748	33	–	64
PS 3	44	678	427	106	–	12
PS 4	45	626	400	97	–	8
PS 5[d]	65	175	50	33	–	8
PS 6[c]	655	1,333	176	100	–	46
PS 7	373	913	389	72	–	28
PS 8[c]	618	1,115	126	90	–	41
PS 9	581	1,207	451	91	–	37
PS 10[c]	1,765	1,393	298	107	–	46
PS 12	578	1,196	458	95	–	39
VMT[e]	1,757	1,578	137	278	–	3,464[f]
Total	6,532	11,593	4,203	1,222	–	3,821

[a] ADEC (1996a–k) unless otherwise noted. Potential annual emission rates for combustion sources were calculated values based on maximum allowable annual fuel use rates and tested source, or the U.S. Environmental Protection Agency's (EPA's) AP-42 emission factors (EPA 2001a). Actual emissions are generally smaller.

[b] A dash indicates that the amount emitted is estimated to be negligible.

[c] Pump stations are currently in rampdown mode.

[d] Particulate matter with a mean aerodynamic diameter of 10 μm or less (PM_{10}) and volatile organic compound emission rates at PS 5 are not available. They are conservatively estimated to be similar to those at PS 2 and PS 4, respectively.

[e] VMT = Valdez Marine Terminal (source: Norton 2001).

[f] Thomas (2002).

Source: BLM (2002), Table 3.13-3.

TABLE 5 Monitored and Modeled Ambient Data for Criteria Pollutants in and around TAPS Facilities

		Ambient Concentration (µg/m^3)										PSD Class II Increments (µg/m^3)			
	Pollutant:	SO_2			NO_2	CO		O_3	PM_{10}		Pb	SO_2			NO_2
	Averaging Period	3 Hours	24 Hours	Annual	Annual	1 Hour	8 Hours	1 Hour	24 Hours	Annual	Quarter	3 Hours	24 Hours	Annual	Annual
	Standard	1,300	365	80	100	40,000	10,000	235	150	50	1.5	512	91	20	25
Monitoring/ Modeling Program	Location														
Prudhoe Bay	CCP	34	24	3	26	–[b]	–	116	70	12	–	–	–	–	–
Oil field monitoring[a]	GC 1	131	39	3	21	–	–	112	155	12	–	–	–	–	–
	A Pad	–	–	–	13	–	–	180	–	–	–	–	–	–	–
Kuparuk River	CPF 1	44	26	5	16	<1,300	<950	116	108	11	–	–	–	–	–
Oil field monitoring[a]	DS-1F	55	10	3	5	<1,300	<950	100	57	7	–	–	–	–	–
PS Modeling	PS 2[c]	–	–	–	55	–	–	–	–	–	–	–	–	–	2
	PS 7[c]	171	76	19	64	–	–	–	–	–	–	6	2	1	5
	PS 7[d]	211	84	21	–	–	–	–	–	–	–	–	–	–	–
	PS 8[d]	427	264	66	–	–	–	–	–	–	–	–	–	–	–
	PS 9[d]	181	80	20	–	–	–	–	–	–	–	–	–	–	–
	PS 10[d]	244	109	27	–	–	–	–	–	–	–	–	–	–	–
	PS 12[d]	422	188	48	–	–	–	–	–	–	–	–	–	–	–
	Generic PS[e]	225	187	15	87	3,600	1,700	–	110	15	–	24	26	1	–
EPA Monitoring[f]	Fairbanks	–	–	–	–	21,600	13,800	–	98	29	–	–	–	–	–
Williams Refinery Monitoring[g]	North Pole	107	55	8	12	–	–	–	–	–	–	–	–	–	–
VMT Monitoring[h]	VMT-TVR	222	65	10	17	2,100	1,100	122	87	15	0.1	–	–	–	–
VMT Modeling[i]	VMT-TVR	1,187	280	23	33	–	–	–	65	11	–	117	34	7	4
Background	North Slope[j]	10	7	3	3	–	–	–	8	2	–	–	–	–	–
	Beluga Site[k]	13	5	3	2	3,100	1,500	104	32	7	–	–	–	–	–
	Valdez[l]	35	16	3	6	–	–	–	23	7	–	–	–	–	–

Footnotes on next page.

TABLE 5 (Cont.)

[a] Highest recorded value between 1986 and September 30, 1999 (TAPS Owners 2001; SECOR 1995). CCP = Central Processing Plant; GC = Gathering Center; CPF = Central Production Facility; DS = Drill Site.

[b] A dash indicates data not available, not modeled, or not relevant.

[c] Maximum values estimated by modeling conducted for 1990 PSD application for addition of rim cooling to mainline turbine units (APSC 1990a,b).

[d] Maximum values estimated by modeling conducted for 1991 application for increase in turbine fuel sulfur content (APSC 1991).

[e] Maximum values estimated by modeling conducted for 1997 modeling report for generic pump station (PS) under actual maximum operating conditions using fuel with 0.24% sulfur content, including background concentration (APSC 1997).

[f] Highest (or highest second high) value recorded at ambient monitoring stations in Fairbanks (three stations for CO and two stations for PM_{10}) between 1996 and 2000 (EPA 2001b).

[g] Highest (or highest second high) value recorded at ambient monitoring stations at the Williams Alaska North Pole Refinery monitoring site between February 1, 2000 and January 31, 2001 (HMH 2001).

[h] TVR = Tanker Vapor Recovery; VMT = Valdez Marine Terminal; highest (or highest second high) values recorded at two VMT ambient monitoring sites between 1st quarter 1990 and 1st quarter 1993 (Fluor and TC 1995).

[i] Maximum values estimated by modeling for total postconstruction facility impacts conducted for 1995 Valdez Marine Terminal PSD application for tanker vapor recovery system (Fluor and TRC 1995).

[j] 1999 measurements at the Alaska North Slope Eastern Region Monitoring Station (DeWandel 2001).

[k] Highest background values from the site located in Cook Inlet, used for generic modeling purpose (APSC 1997).

[l] Background values estimated from the monitoring data in the Valdez area, used in air quality impact modeling study for the VMT-TVR project (Fluor and TRC 1995).

Source: BLM (2002).

and the Pacific Coastal Mountains (MP 610 to MP 720). Evergreen forests of black and white spruce are the predominant vegetation in the boreal forest zone, with extensive deciduous forests also present. The coastal forest zone is found along Alaska's southernmost coast (MP 780 to MP 800). The predominant vegetation type in this zone is evergreen forest, primarily Sitka spruce-western hemlock.

Included in each of these zones are wetland and upland vegetation types. According to the 1988 estimates made for the adjacent Trans-Alaska Gas System proposed route, approximately 51% of the TAPS ROW may consist of wetlands (BLM 2002).

3.7 FISH

Twenty-nine species of fish are known to occur or could occur within the rivers, streams, or waters adjacent to the TAPS ROW. Fifteen species of fish have been reported along the TAPS ROW within the North Slope region (MP 0 to MP 170); the predominant species noted were Dolly Varden, broad whitefish, Arctic cisco, and Arctic grayling. In the Interior Alaska region (MP 171 to MP 605), the pipeline runs along or crosses several major streams and rivers, most of which are in the Yukon River drainage. At least 19 species of fish occur within the Yukon drainage, with Arctic grayling, anadromous and resident Dolly Varden, and chum, coho, and chinook salmon present in the vicinity of the ROW. South of the Alaska Range (MP 606 to MP 800), the ROW primarily crosses streams and rivers of the Copper River drainage. Seventeen species of fish occur here; sockeye, coho, and chinook salmon are the dominant species.

3.8 BIRDS

Up to 481 species of birds have been reported in Alaska. Of these species, 226 are known to breed in the state; the remainder are migratory species. Because of the diversity of habitats crossed by the TAPS ROW and related facilities, it is possible that many of these species occur within the vicinity of the TAPS ROW. Important groups of birds occurring within the ROW include waterfowl and shorebirds, raptors, grouse and ptarmigan, and passerines. Endangered, threatened, or protected species are discussed below.

3.9 TERRESTRIAL MAMMALS

A total of 107 species of mammals occur in Alaska. Important species known to occur along the ROW include moose, caribou, musk ox, American bison, Dall sheep, mountain goat, brown bear, black bear, and the gray wolf. Again, as the ROW crosses a variety of habitats from MP 0 to MP 800, it is possible that many of these species occur within the vicinity of the TAPS ROW.

3.10 THREATENED AND ENDANGERED SPECIES

The Endangered Species Act (ESA) provides protection to species in danger of extinction. An endangered species under the ESA is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species under the ESA is one that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Three bird species that receive protection under the ESA may occur along the TAPS ROW: spectacled eider (threatened), Steller's eider (threatened), and the Eskimo curlew (endangered). Two subspecies of the peregrine falcon, the American and the Arctic, have been delisted from the ESA, but populations are being monitored. No ESA-listed terrestrial mammals or plants species are found along the TAPS ROW (BLM 2002).

In addition, the State of Alaska maintains state-specific lists of endangered species and species of special concern. Four Alaskan species of special concern may occur along the TAPS ROW: olive-sided flycatcher, gray-cheeked thrush, Townsend's warbler, and the blackpoll warbler.

3.11 ECONOMY

Following rapid increases in employment in the 1970s and 1980s associated with construction of the TAPS and the development of North Slope oil, employment growth has slowed, growing only 1.1% on average over the period 1990 through 1998 (BLM 2002). Employment in the oil and gas industry fell over the same period by almost 1.0%. Although employment in the oil and gas industry in 1998 was only 3% of the state total, with other industries such as manufacturing, trade, services, and state and local government providing more jobs than oil and gas, the industry contributed 19% of total Gross State Product. A major factor contributing to the importance of the industry in the state is the fact that earnings per employee in the industry are much higher than the average for all industries in the state. In addition to employee wage and salary expenditures, expenditures by the oil and gas industry on materials, equipment, and services, also create a large amount of additional activity in other industries in the state. Similarly, in the pipeline corridor region, consisting of the six boroughs and census regions through which TAPS passes, oil and gas employment is only 4% of the total, with other industries providing more jobs. As is the case at the state level, the contribution of the oil and gas industry to the economies of local communities in the region is much more significant than is suggested by the employment data.

Since the early 1970s, unemployment rates in the state have been consistently higher than in the nation as a whole, and despite falling national rates during the 1990s (BLM 2002), the current rate in Alaska of 5.7% is still slightly higher than the national rate (BLS 2003). Unemployment rates in the state often conceal the extent of joblessness, especially in rural areas where the widespread lack of employment opportunities often means that many unemployed individuals who would like to work do not register for unemployment benefits. Unemployment rates in the pipeline corridor region during the 1990s were lower than the state average in Anchorage and in the North Slope Borough, and were much higher than the state average in Southeast Fairbanks and in Yukon-Koyukuk. In addition to higher unemployment in Southeast

Fairbanks and Yukon-Koyukuk, declining North Slope oil production now means that the North Slope Borough currently also has a higher rate of unemployment than in the state as a whole.

3.12 SUBSISTENCE

The Federal Subsistence Board defines subsistence as the customary and traditional uses of wild, renewable resources by rural Alaskans for direct personal or family consumption. Subsistence fulfills economic, sociocultural, and ceremonial roles for rural Alaskans. Economically, subsistence provides a means of obtaining resources necessary for survival, which may be difficult to obtain through other means. Sociocultural benefits are evident in the case of Alaska Natives, who can use subsistence activities to provide a link between their present sociocultural systems and their traditional lifestyles. Subsistence activities and resources can also contribute to indigenous ceremonial activities, such as potlatches. Important subsistence resources include caribou, moose, and salmon.

3.13 ENVIRONMENTAL JUSTICE

Section 29 of the Federal Grant provides a base level of employment and stipulates that 20% of employees be Alaska Native. This percentage of Alaska Natives in the workforce is met for current operations.

Executive Order 12898 (U.S. President 1994) directs federal agencies to address, as appropriate, the disproportionately high and adverse human health and environmental effects of their actions, programs, and policies on minority and low-income populations. Subsequent general guidelines have been issued by both the Council on Environmental Quality (CEQ) and the EPA for the evaluation of environmental justice under NEPA. Section 3.29 of the TAPS FEIS (BLM 2002) analyzes and discusses, pursuant to the CEQ and EPA guidelines, the presence of minority and low-income populations in communities affected by TAPS operations, including this strategic reconfiguration. That analysis, which is incorporated by reference and from which this assessment is tiered, concludes that minority and low-income populations do occur in affected communities in disproportionately high percentages.

3.14 CULTURAL RESOURCES

Several archaeological sites have been recorded in the vicinity of the TAPS (1,062 sites within 0.5 mi of the TAPS) (BLM 2002). The State Historic Preservation Office (SHPO) maintains information on known cultural resources at specific locations along the TAPS. Section 3.15 of the APSC Grant and Lease Compliance Manual (GL-2) states that if any cultural material is discovered during activities related to O&M of the TAPS, work must stop immediately and the BLM Authorized Officer and State Pipeline Coordinator contacted (APSC 2003). Any work that takes place on undisturbed ground must be evaluated in compliance with Section 106 of the National Historic Preservation Act (NHPA; *United States Code*, Title 16, Section 470F), as amended.

An historical evaluation of the TAPS has not been conducted. The TAPS is an example of remarkable engineering design and construction in an extreme environment over a short period of time. It also serves a central role in the economy of Alaska and makes a significant contribution to the domestic oil industry. As such, it may become eligible for listing on the *National Register of Historic Places* under Criterion C for Engineering during the 30-year renewal period as mentioned in the TAPS FEIS.

3.15 LAND USE, COASTAL ZONE MANAGEMENT, RECREATION, AND VISUAL RESOURCES

There are many outstanding visual resources along the TAPS ROW. With the exception of the TAPS and localized urban centers, much of the area is pristine and undeveloped, and provides beautiful views of the Arctic Coastal Plain, Alaska and Brooks Ranges, and Delta and Gulkana Wild and Scenic Rivers (WSRs).

In addition to sightseeing, there are many recreational opportunities along the TAPS ROW, including backpacking, hunting, trapping, sport fishing, canoeing, kayaking, skiing, dog mushing, and mountain biking. Recreational areas near the pipeline include National Parks; National Wildlife Refuges; National WSRs BLM lands, including a national recreation area; and state lands, including state forest, recreation sites, areas, and parks.

3.16 TRANSPORTATION

Three Alaska Highways run parallel to the TAPS ROW: the Richardson, the Elliot, and the Dalton. The Richardson and Elliot Highways are paved two-lane roads that parallel the ROW for 363 mi and 72 mi, respectively. Between Valdez and Fairbanks, annual average daily traffic (AADT) counts can range from 300 to 22,400 vehicles per day. Traffic is generally higher near the communities of Valdez, Glennallen, Delta Junction, and Fairbanks; during the summer months, traffic can rise to double the annual averages.

The Dalton Highway is a 28-ft-wide crushed gravel road, paralleling the ROW. Commercial trucks constitute 40% of the traffic on the Dalton Highway; the AADT over the entire length of the highway was 233 vehicles per day in 2000. This highway is currently undergoing improvements, including widening to 32 ft and resurfacing, to reduce the amounts of fugitive dust produced by traffic. Approximately 90 to 95% of the resurfacing is anticipated to be completed by 2006.

In addition to the 3 main highways, 248 secondary roads provide private access to the pump stations, pipeline, and airstrips. These secondary roads range from 120 ft to 7.5 mi long, and generally consist of a 28-ft-wide mineral material base.

3.17 HAZARDOUS MATERIALS AND WASTE MANAGEMENT

Hazardous materials are used in the operation of the TAPS ROW; liquid turbine fuel is the most prevalent. Collectively, over 8 million gal of diesel fuel are present at all APSC facilities at any given time. Gasoline, propane, and petroleum-based solvents are also present in substantial quantities. Hazardous materials are stored at pump stations.

Solid wastes are classified into three categories: industrial, domestic, and office. Recycling programs are in place for certain solid wastes like scrap metals and paper. Incinerators at the pump stations are used to reduce the volume of solid waste that is both nonrecyclable and nonhazardous and permitted by the facility air permits. Ash from the incinerators as well as inert solid waste is disposed of at permitted solid waste disposal sites operated by either APSC or municipalities. A small fraction of industrial solid waste meets the federal definition of hazardous waste.

Hazardous wastes are stored at pump stations prior to being transported to a permitted treatment, storage, and disposal facility by a licensed transportation contractor. With the exception of the VMT, the TAPS maintains conditionally exempt small quantity generator or small quantity generator status. Generated hazardous wastes include spent thinners and cleaning solvents, flammable paints and coatings, used oils containing chlorinated compounds, spent aerosol cans, universal lamps and batteries, and residues cleaned out from pump stations.

4 ENVIRONMENTAL CONSEQUENCES

4.1 PROPOSED ACTION

4.1.1 Normal Operations

This section describes the environmental consequences of strategic reconfiguration of the TAPS. Reconfiguration impacts are assessed for two phases where applicable: (1) construction and installation of new equipment, including removal of some equipment necessary to make room for new equipment, and (2) transition and operations (pump stations become fully operational). Impacts related to oil spills are assessed in Section 4.1.2.

4.1.1.1 Soils, Permafrost, and Sand and Gravel

At pump stations where new equipment would be installed, possible removal of equipment to make way for new equipment, construction of foundations, and installation activities would create short-term and minor disturbances to the gravel pad. The gravel pads at the pump stations would also be graded for the purposes of fire prevention and containment during a petroleum spill. These disturbances may result in minor changes in drainage on the pad and cause local, small-scale ponding on the pad. Where contaminated materials are removed prior to installation of new equipment, sand and gravel may be used to fill the excavations. The impacts of this use are within the historical range of TAPS operations, as assessed in the TAPS FEIS.

Currently, PS 1, 2, 3, 5, and 6 have underground brine systems in place that keep the ground frozen (OASIS 2003; TAPS Owners 2001). This protects the facilities from unstable ground due to changing permafrost regimes during normal operations. If removing or disabling underground brine systems were necessary during installation of new equipment, some change in distribution of permafrost within or below the pad may occur, causing frost heaves, thermokarsting, and/or subsidence. However, since APSC would be maintaining the pads as part of routine maintenance, slight shifts in the permafrost regime would not affect the soil stability or pad integrity. At pump stations where brine lines would be left in place to protect the remaining structures, no impacts to permafrost are expected.

There would be no impacts to soils, sands and gravels, or permafrost once transition has occurred and the reconfigured units are operating.

4.1.1.2 Surface Water and Groundwater Resources

During facility upgrade, construction of foundation structures, and installation and modification of new equipment, freshwater would be required for manned facilities, equipment washing, material compaction, dust abatement on roadways and pads, and hydrostatic testing.

The peak number of workers needed for this phase of reconfiguration would be from 31 to 85 during the first season and from 31 to 154 during the second season. Where living quarters are provided, personnel on duty typically consume and discharge up to 100 gal of water per person per day for potable water use (i.e., drinking water, food preparation, and personal hygiene); day-use consumption is smaller, on the order of 40 gal/d. During the peak months of activity from 3,100 to 8,500 gal/d of additional water would be needed for domestic use in the first year, while 3,100 to 15,400 gal/d of additional water would be needed for domestic use in the second year. These requirements are large in comparison to historical water use (Table 6). However, they are less than existing supplies for which information is reported, and additional capacity is available for nondomestic, construction water requirements. The combined current capacity of wells used by the TAPS is more than 270,000 gal/d, more than sufficient capacity for the needs of existing operations plus reconfiguration activities.

Wastewater discharges at the TAPS pump stations include sanitary discharges. These are comparable in magnitude to water used for domestic purposes. Table 7 compares projected sanitary wastes generated during peak workforce during reconfiguration, with the design capacity of treatment facilities. Current wastewater disposal includes stack injection (PS 1, 3, and 4), secondary biological treatment (PS 3, 5, and 6), and septic systems (PS 7, 8, 9, 10, and 12). Because they do not currently house workers, PS 2 and 11 do not have waste disposal systems in operation.

TABLE 6 Historical and Projected Water Use during Two Seasons of Reconfiguration Activities

Pump Station	Recorded Water Use[a]	Year 1 (Peak)[b]	Year 2 (Peak)[b]	Notes	Capacity (gal/d)[c]	Source
PS 1	1,946	3,666	8,106	Day use	Capacity purchased	North Slope Bureau's Service Area 10
PS 2	3,872	6,972	3,872	Resident	108,000	Sagavanirktok R. (well)
PS 3	7,439	16,311	16,838	Resident	> 75,600	Sagavanirktok R. (3 wells)
PS 4	7,360	5,890	17,260	Resident	108,000	Atigun River (well)
PS 5	6,239	9,339	9,339	Resident	36,000	Jim River (well)
PS 6	–[d]	3,100	3,100	Resident	72,000	Subpermafrost (2 wells)
PS 7	3,696	3,696	9,796	Resident	25,000	Subpermafrost (well)
PS 8	–	1,240		Day use	Not reported	Not reported
PS 9	–	1,400	5,640	Day use	36,000	Subpermafrost (well)
PS 10	14,756	17,856	14,756	Resident	161,000	Delta River, subpermafrost (2 wells)
PS 11	–	1,240		Day use	None	Not reported
PS 12	4,661	7,761	4,961	Resident	50,400	Talik and Little Tonsina River

[a] Source: TAPS FEIS (BLM 2002), Figure 3.1-1.

[b] Recorded water use plus peak reconfiguration workforce requirement (100 gal/d for a resident, 40 gal/d for day-use). Does not include other water uses.

[c] Calculated from gal/min capacity reported in TAPS FEIS (BLM 2002), Table 3.1-2.

[d] A dash indicates data not given by source.

TABLE 7 Historical and Projected Sanitary Waste Treatment Requirements during Two Seasons of Reconfiguration Activities

Pump Station	Historical Sanitary Flow (gal/d)	Year 1 (Peak)	Year 2 (Peak)	Worker Presence	Treatment Design Capacity (gal/d)	Type
PS 1	2,000	4,000	8,000	Day use	10,000	Stack injection
PS 2	4,000	7,000	4,000	Resident	10,000	Not in current use
PS 3	7,500	16,000	17,000	Resident	10,000	Stack injection, secondary biological
PS 4	4,700	6,000	17,060	Resident	10,000	Stack injection
PS 5	6,300	9,000	9000	Resident	8,000	Secondary biological
PS 6	6,500	3,000	3,000	Resident	6,000	Secondary biological
PS 7	3,800	3,800	10,000	Resident	3,400	Septic
PS 8	600	1,200		Day use	1,000	Septic
PS 9	800	1,400	6,000	Day use	1,000	Septic
PS 10	4,200	18,000	15,000	Resident	12,000	Septic
PS 11	None	1,200		Day use	None	None
PS 12	4,200	7,800	5,000	Resident	9,100	Septic

Projected peak sanitary waste production during reconfiguration would exceed current treatment capacity at PS 3, 4, 5, 7, 8, 9, and 10. These peak flows would occur during a period of one to three months. Various alternatives exist to mitigate the impact of a temporary increase in workforce on sanitary waste disposal facilities. These include mobile waste disposal units, trucking wastes to other facilities with capacity to treat the wastes, or storing the wastes until flows decline to below design capacity of the existing treatment units. There are also two mobile contingency camp facilities (MCCFs); one is located at PS 3 and the other is inactive and located at PS 10. These two facilities utilize biological secondary treatment and discharge clean effluent to adjacent lands. In addition, a fly camp is located at PS 6 and utilizes a secondary biological treatment system for wastewater discharge. Although PS 6 is currently ramped down, a skeleton crew is on site for oil spill response. These residents stay in the permanent living quarters. If overflow personnel are located at the MCCFs, this would reduce the sanitary waste treatment requirements for pump stations where sanitary waste generation exceeds treatment capacity.

Wastewater discharges are permitted by state and federal agencies. APSC discharges the wastewater in accordance with these permits. Should expected waste treatment during reconfiguration exceed existing capacity, APSC would develop a mitigation plan and seek a modification to these permits.

Stack injection at PS 1 and 4 needs adequate heat output to operate properly. After reconfiguration, stack injection would not be used because heat may not be sufficient due to either connection with the local electric grid for power (PS 1) or the reduced heat generated by the new turbine generators (PS 1 or 4). In these cases, alternative methods of discharge may be needed (such as a package biological treatment plant). Absent new or revised treatment facilities

on site, wastewater would be hauled to approved treatment facilities at Prudhoe Bay or Fairbanks.

Oily rinsate from washed equipment or remediation of gravels could be disposed of two ways. If possible, the rinsate could be injected into the pipeline. For example, some pipes may be cleaned with petroleum-based products (diesel fuel). These rinsates are usually injectable without question. Oily rinsate could also be treated on site and discharged to the pad, or transported. If oily water is injected into the pipeline it must be performed in close coordination with APSC operations. Too much water in the system can impact the oil refineries, thus input into the pipeline is closely controlled. Water discharged to the pad is only possible if a treatment system is on site and functioning properly. The ADEC would likely require water testing before discharge to ensure that discharges meet water quality standards or permit requirements. Ultimately, the method of treatment would be decided on by an evaluation of logistics, costs, and convenience.

4.1.1.3 Air Quality

During installation of new equipment at the pump stations, when existing air emission sources are still operating, air quality impacts would be the same as those reported in the TAPS FEIS (BLM 2002), with the exception of possible slight increases in fugitive dust. Removal of existing equipment for installation of new equipment would generate dust and recycled materials, and wastes would be transported from the pump stations. Water used for dust suppression is permitted at the pump stations and would be used to reduce dust emissions during dry periods.

More people would be present on site during construction and transition activities than are normally present for current operations. Any increases in traffic to bring workers to the pump stations (on the order of seven trips per day) would result in minor increases in fugitive dust generated along the Dalton Highway. Depending on the area, the highway surfaces have recently been or will be improved to reduce dust generation below levels modeled in the TAPS FEIS. An increase of about 5% in traffic because of workforce movements during reconfiguration would have a minor impact on dust generation.

The increase in personnel would likely cause increases in other air pollutants, including increased emissions from fuel combustion from vehicles, portable power generators, portable heaters, operation of existing incinerators used for domestic and nonhazardous waste disposal,[4] and from personal living quarters, including heaters and cooking equipment. These sources of air emissions would be short-term and would not have a lasting impact on local air quality.

Operation of the reconfigured pump stations with fewer and more efficient turbines would result in reduced long-term air emissions. Exact changes in air emissions, and thus the long- and short-term impacts from strategic reconfiguration, would depend on final decisions on

---

4 New air quality regulations may not allow the use of incinerators during the reconfiguration of the pump stations.

the type of generators that would be used and whether commercial power would be used at PS 1 and 9. Table 8 provides a first estimate of the substantial reduction in air emissions that could be achieved by reconfiguration, in many cases an over 90% reduction. If commercial power is not used at PS 1 and 9, air emissions reductions would be less.

Other sources of air emissions, such as emissions from check valves, living quarters, and operation of vehicles, would be eliminated or reduced during reconfiguration. Savings in fuel consumption, both liquid and natural gas, are also expected. Examples include savings at waste incinerators, heating boilers (at the living quarters), and some transfer pumps. Though not major sources of air emissions, especially compared with the mainline turbine units, elimination or reduction in these sources would help reduce overall air emissions and thus impacts on air quality. As with specific air pollutants, the quantities of fuel used by these sources at the pump stations are unknown until the specific equipment is selected, but would be reduced below current levels. Table 8 gives the preliminary estimates of the magnitude of reductions in emissions that could be achieved with reconfiguration.

4.1.1.4 Noise

Typical construction-related short-term increases would occur in local noise during both installation of new equipment and facilities and during possible removal of existing equipment or facilities at each pump station. Operation of heavy equipment and generators, primarily diesel generators, would be the primary sources. The pump stations are in remote areas and any noise generated from the operations would be barely discernable from background near any human dwelling (BLM 2002).

After reconfiguration, noise levels would be less than current levels. The new electric power generator turbines are predicted to be quieter than present turbines, and there would be no need for power generators for housing employees. General maintenance activity around the pump stations would be reduced, thus reducing the frequency of those noise sources.

4.1.1.5 Terrestrial Vegetation, Wetlands, and Riparian Zones

During installation of new equipment, pad preparation and construction activities may produce dust that could affect local vegetation; however, these effects should be temporary and local. Activities are expected to be confined to the pad of each pump station, and no surrounding habitats would be disturbed. Because reconfiguration activities would be confined to station roadways and pads, no new habitats for invasive, nonnative species would be created.

APSC maintains operating procedures for the prevention of runoff from the pads. It requires contractors to review environmental guidelines prior to starting work, which should prevent errant equipment operations. Impacts from runoff to adjacent areas of vegetation are expected to be absent or negligible. APSC operates under Storm Water Pollution Prevention Plans (SWPPPs) written for each facility. The plans outline specific measures APSC takes to

TABLE 8 Air Emissions from Operation of PS 1, 3, 4, and 9

Pump Station	Period	Throughput (million bbl/day)	Power (kW)	Emissions (tons/yr) NO_x	CO	PM_{10}	SO_2
PS 1	Actual (07/1999–06/2000)	1.09		320.9	887.4	28.8	5.9
	Actual (2002)	1.06		288.0	1,014.0	27.0	8.0
Commercial power	Forecast (based on design)[a]	1.00	15,400	34.5	67.5	5.3	2.9
	Reduction from 2002			88%	93%	80%	64%
Gas-fired turbine power	Forecast (based on design)[a]		15,400	177.9	99.1	10.2	5.2
	Reduction from 2002			88%	9%	19%	36%
PS 3	Actual (07/1999–06/2000)	1.09		280.0	956.2	24.3	7.0
	Actual (2002)	1.06		229.0	952.0	21.0	7.0
	Forecast (based on design)[b]	1.00	13,300	203.9	53.8	9.4	5.2
	Reduction from 2002			11%	94%	55%	3.5%
PS 4	Actual (07/1999–06/2000)	1.09		203.0	981.0	18.0	3.4
	Actual (2002)	1.06		166.0	562.0	14.0	4.0
	Forecast (based on design)[b]	1.00	11,600	134.6	37.2	5.0	2.6
	Reduction from 2002			9.2%	93%	64%	35%
PS-9	Actual (07/1999–06/2000)	1.09		478.9	95.0	42.0	250.7
	Actual (2002)	1.06		384.0	169.0	32.0	176.0
Commercial power	Forecast (based on design)[c]	1.00	18,800	28.5	6.7	1.2	10.6
	Reduction from 2002			92%	96%	96%	94%
Gas-fired generator power	Forecast (based on design)[c]		18,800	833.3	5.6	11.9	217.1
	Reduction from 2002			Increase (2×)	3%	27%	6%

[a] Reconfigured (utility power + 4.5 MW Genset).

[b] Reconfigured (2 each gas turbine generators running at 50% capacity + 750 kW Genset).

[c] Reconfigured (utility power + 4.5 MW Genset).

Source: Brendel (2003).

minimize effects of storm water to adjacent lands. Contractors may develop their own SWPPPs for their construction activities or may be allowed to operate under APSC's plans. Either plan, if executed properly, would mitigate impacts to adjacent wetlands.

During operation of the reconfigured pump stations, impacts on surrounding vegetation from dust would be reduced from current levels because of reduced activity. Maintenance activities would continue to maintain the pad to prevent drainage to surrounding areas. There would be less dust generated by traffic to the pump stations, and the new equipment would produce substantially less criteria air pollutant emissions.

4.1.1.6 Fish

No impacts to fish are expected from any strategic reconfiguration activities. No work would take place in any rivers, lakes, or streams. Runoff at pump stations during reconfiguration and during operation of the reconfigured pump stations would be controlled through the development of SWPPPs, and the pads would be maintained to prevent runoff to surrounding waterways.

Water withdrawals from wells that tap unfrozen taliks (unfrozen ground or thaw bulb) would increase during reconfiguration. These taliks are connected to nearby streams where fish overwinter. Taliks provide water to unfrozen areas at the streams, which is necessary for fish survival. However, increased water withdrawal for reconfiguration would occur primarily during the warmer months, and the peak workforce would only be on site for a short duration. No impacts on fish populations are expected from increased water use during reconfiguration. During operation of the reconfigured pump stations, water withdrawals from taliks would be reduced because of a reduced workforce.

4.1.1.7 Birds

Some species of birds currently nest on pump station infrastructure. Cliff swallows use the buildings, staircases, and landings to construct their mud nests. Ravens have been noted to nest on communications towers, and there is the occasional other passerine that may nest on a beam or other pump station structure. Birds accustomed to nesting on pump station structures could be disturbed during some reconfiguration activities by noise, human activity, and possible removal of unnecessary equipment. These birds may or may not find suitable nesting areas elsewhere. Reduction in human activity during operation of the reconfigured pipeline would decrease impacts on any nesting birds sensitive to disturbance from noise or human activity.

The timing of reconfigured operations is of concern with respect to nesting birds. Should the birds establish their nests prior to the commencement of construction activities, the Migratory Bird Treaty Act protects them until they have finished nesting.

4.1.1.8 Terrestrial Mammals

Any impacts to terrestrial mammals during reconfiguration are expected to be minor and temporary. Various mammal species residing in areas surrounding the pump station may include certain pump stations facilities as their habitat. These include species of bears, foxes, ground squirrels, and other small mammals. APSC has long had wildlife interaction policies in place for employees that minimize the interactions between humans and wild mammals. These would continue to be implemented during reconfiguration and would continue to help minimize wildlife impacts. However, some individual mammals may find that reconfiguration activities exclude them from previously occupied structures at the pump stations. On a populationwide basis, these impacts would be negligible. Once reconfiguration has been accomplished, operations would provide similar opportunities for occupancy by mammals as before.

Bears are always a concern when working in remote areas of Alaska. Employees would receive safety and environmental briefings to point out the proper procedures when working in bear habitat. Bears are likely to avoid the reconfigured operations unless there is improper handling of garbage. Garbage continues to be the single greatest attractant of bears into areas of human concentration. This can be mitigated by briefing work crews on the proper handling of garbage to ensure that bears are not attracted to the work areas.

4.1.1.9 Threatened and Endangered Species

Threatened and endangered species should not be impacted throughout reconfiguration. Spectacled and Steller's eiders are both threatened species of birds that reside on the North Slope. Steller's eiders are generally found much farther west than PS 1 and are seldom seen in the pump station vicinity. Spectacled eiders are documented to nest in the Prudhoe Bay unit, but none have been documented in close proximity to PS 1. Reconfiguration activities at PS 1 would not include appreciably more activity than already occurs on a daily basis on the North Slope. Neither species of eider will be impacted by the activities at PS 1.

The Eskimo curlew is listed as endangered; however, many believe the bird is extinct. No birds have been seen for many years. Their nesting habitat is in upland areas of the interior, thus activities at a pump station would not affect the birds.

Even though two subspecies of peregrine falcon (American and Arctic) have been removed from the endangered species list, APSC continues to operate to protect the species. During nesting season, air and ground traffic near nest sites are restricted. Nesting occurs close to PS 2 and 6. Reconfiguration activities at these pump stations, however, are not expected to cause disruptions to peregrine falcon nesting.

4.1.1.10 Land Use

The proposed action is consistent with the historical use of lands in the TAPS ROW as discussed in the TAPS FEIS (BLM 2002), and that discussion is incorporated by reference. The

reconfiguration of the pump stations would not interfere with adjacent land uses and would not impact any protected resources in areas of special environmental concern managed by the BLM. The proposed action is in compliance with relevant management plans, including the Utility Corridor Resource Management Plan (RMP), the Fort Greeley RMP, the Fort Wainwright RMP, and the South Central RMP.

4.1.1.11 Economy

Reconfiguration of the TAPS would provide APSC with operating efficiencies that would benefit the economy of the state as a whole. The proposed reconfiguration would result in reduced operating costs for the pipeline compared with the no action alternative. Lower TAPS costs would extend the economic lifetime of the pipeline, which would provide increased future income, including to the State, and would reduce the volume of North Slope oil "stranded" (not recoverable) when TAPS operations cease. In the pipeline corridor region, there would also be temporary benefits at the local level as construction (and demolition) activities and equipment installation at each pump station would create direct employment in local communities, and as construction worker wage and salary spending would produce additional jobs and income in other parts of the local economy at each pump station. The overall employment impacts of construction activities would be a 0.2% increase in total state employment. At the regional level, impacts would range from a 0.2% increase in total regional employment in the Fairbanks-North Star area in the peak month in 2004, to a 9.4% increase in the Yukon-Koyukuk and Southeast Fairbanks area in the peak month in 2005.

Once reconfiguration activities have been completed, there would be a redistribution of the workforce operating the pump stations in their current format. While some of the workers displaced by the reconfiguration would be reassigned to other parts of APSC's operations, there would also be a number of layoffs. The impact of employment reassignment and workforce reduction on the state could be up to a 0.2% reduction in total state employment. In the pipeline corridor region, the impact of employment adjustments would range from a 0.2% reduction in total regional employment in the Anchorage area, to a 3.3% reduction in the Southeast Fairbanks area. Given the lack of alternate employment opportunities in many of the rural communities in which the pump stations are located, reconfiguration would likely lead to higher unemployment rates, particularly in Southeast Fairbanks, Yukon-Koyukuk, and the North Slope Borough.

4.1.1.12 Subsistence

Impacts to subsistence resources from strategic reconfiguration are likely to be negligible. Competition for subsistence resources would remain unchanged. Elimination of fuel hauling at three pump stations would reduce the potential for large fuel spills from fuel hauling trucks affecting subsistence resources. Access to subsistence resources is unlikely to be materially affected by the proposed action, and no new roads or access points would be constructed that would lead to competition for subsistence resources. Details regarding the analysis of the effects of TAPS operations on subsistence can be found in Section 4 and Appendix E of the TAPS FEIS.

4.1.1.13 Environmental Justice

APSC's Native hire programs under the Alaska Native Utilization Agreement would continue during all phases of the action. While any reductions in pump station staffing and elimination of fuel hauling at three pump stations may affect the number of Alaska Native workers, the overall numbers would continue to meet the requirements of Section 29 of the Federal Grant, that 20% of APSC's employees be Alaska Native, including agents, contractors, and subcontractors.

The evaluation of the proposed project for environmental justice implications is first dependent on the identification of high and adverse impacts on other assessed impacts areas (e.g., surface water, human health, etc.). If high and adverse impacts are identified, then it must be assessed whether those impacts would affect minority or low-income populations disproportionately. Disproportionate impacts can occur in two ways: (1) because the environmental justice population under consideration is present at a percentage higher than found in the state as a whole, or (2) because the environmental justice population under consideration is more susceptible to such impact. The present analysis of the proposed action does not find that there are any reasonably probable direct, indirect, or cumulatively high and adverse impacts. Accordingly, environmental justice considerations do not require a further assessment of whether there would be disproportionate impacts to minority and low-income populations.

4.1.1.14 Cultural Resources

The proposed reconfiguration activities would be confined to the existing pump station pads, and no impacts to archeological resources are anticipated. The TAPS is an example of remarkable engineering and construction. As stated in the TAPS FEIS (BLM 2002), if any large or central portions of the pipeline, including associated facilities (i.e., pump stations), were to be dismantled during the 30-year renewal period, consultation with the Alaska SHPO would be required under Section 106 of the NHPA. Only a minor amount of equipment removal is included in the proposed reconfiguration activities; therefore, no impacts to historic structures would occur.

4.1.1.15 Recreational and Visual Resources

Installation of new equipment and related possible removal of equipment may slightly increase the negative visual impact of the pump stations because of increased activity and the visibility of a drill rig (PS 1 and 3) and 230-ton crane (PS 1, 3, 4, and 9). This equipment would be in place for one or two months. No other impacts are anticipated.

4.1.1.16 Transportation

During installation of new equipment and related possible removal of equipment, short-term, minor impacts to transportation would occur from transportation of crews and

equipment. The most trips would involve daily transportation of workers by bus from nearby communities or from other pump stations. For example, two buses and five trucks would move daily from Prudhoe or PS 3 to PS 2 for a period of two months. Traffic of this magnitude is small compared with average daily traffic on the Dalton Highway (233 vehicles per day in 2000, see Section 3.16). Strategic reconfiguration would reduce traffic from pump station operations. Reducing fuel consumption at the pump stations would result in a decrease in traffic associated with hauling fuel to these locations. Since 40% of the traffic on the Dalton Highway is due to commercial vehicles (BLM 2002), reducing the need for large fuel trucks would lead to a reduction in fugitive dust and wear on infrastructure.

4.1.1.17 Hazardous Materials and Waste Management

During the physical modifications at each pump station, possible removal of equipment, and transition to reconfigured operations, the generation of solid wastes would increase. Both domestic waste from increases in worker populations and the production of hazardous waste are expected to increase during installation of new equipment and possible removal of old equipment. However, these increases would be of short duration (several months).

As noted in Section 3.17, APSC usually maintains its hazardous waste status as a conditionally exempt small quantity generator or small quantity generator at each pump station. During the physical plant modifications and removal of some equipment, status is not expected to change. Hazardous waste generated would be temporarily stored on site before removal by a permitted hazardous waste contractor and transporter. Wastes would be transported to an approved hazardous waste treatment, storage, and disposal facility. Operation of the reconfigured pump stations would require less overall use of hazardous materials than current operations. Less diesel fuel would have to be delivered and transferred at the pump stations because of more efficient turbine generators. A possible reduction in workforce would mean a large reduction in domestically generated wastes.

4.1.2 Oil Spill Response under Reconfiguration

Extensive TAPS oil spill analyses have been completed, and the impacts of oil spills along the TAPS ROW are presented in the TAPS FEIS (BLM 2002). This assessment is tiered from and incorporates by reference the TAPS FEIS analysis.

4.1.2.1 TAPS Oil Discharge Prevention and Contingency Plan

The discovery of and response to any spill along the pipeline, large or small, are important to the successful long-term operation of the TAPS, which is governed by the *TAPS Oil Discharge Prevention and Contingency Plan* (C-Plan, CP-35-1) (TAPS Owners 2003a,b). The plan is reviewed every year by the BLM, every five years by ADEC, and every five years by the U.S. Department of Transportation. The plan includes the following:

- Equipment and resources and field training for spill responders;
- Prevention enhancements, such as electronic leak detection capabilities and improved leak detection and leak prevention alarm systems, for pump station tanks;
- More than 220 sites along the pipeline ROW designated as oil spill equipment staging and deployment areas, and dedicated oil spill contingency plan buildings and equipment at each pump station;
- Mutual aid agreements with villages near the pipeline to use residents and equipment in the event of a spill;
- Twelve spill scenarios covering a variety of terrain, oil products, spill volumes, and seasonal conditions; and
- Aerial photographs of the pipeline to aid in spill response planning.

The plan divides the pipeline into five response regions, each with its own response plan. The regions are further divided into contingency areas and then into segments. For each segment, the information provided describes containment actions, access, and detailed environmental information.

Reconfiguration of the TAPS raises special concerns regarding oil spill planning and response because (1) potential spill volumes have generally increased (because of changes in valve closure timing) and (2) spill response times could change (because of the relocation of personnel and equipment designated for spill response). The amendments to the TAPS C-Plan were approved by ADEC and the BLM on December 31, 2003. Changes were made to the current plan to ensure adequate protection of the resources on and adjacent to the pipeline ROW. The primary changes in the amended C-Plan include:

- Responders at PS 3 move to PS 4,
- Responders from PS 7 and 8 move to Fairbanks, and
- Responders and equipment at PS 12 move to Glenallen (TAPS Owners 2003a).

The result of these changes will be increases to the average initial response times between pipeline MP 50 and MP 122 (PS 3 area) and MP 706 and MP 770 (PS 12 area). The increased response times are estimated to be about one hour in the farthest locations. There will also be an increase in the average initial response time in the PS 7 area (pipeline MP 389 to MP 430), because although the PS 7 responders regularly work in the Fairbanks area, the actual increase may be more theoretical than real. APSC's analysis also showed an increase in the amount of time required to implement certain tactics at containment sites between PS 7 and PS 8 (MP 490 to MP 542). The net result of an increased response time is that additional habitat will be

disturbed by the spread of oil before it is contained. The greatest relative differential will be for small spills where a single response crew might effectively contain the spread of oil. In a larger spill, where additional responders are added in tiers coming from more distant locations, the differential in total response effectiveness will be lessened. In all cases, the impact from spilled oil would be within the range analyzed in the TAPS FEIS, since that analysis calculated the area impacted on the basis of the volume of oil released in the scenario, with no reduction due to containment actions (see TAPS FEIS, Section 4.4.4.1.2).

Even though the number of personnel available for the Initial Response Teams remains the same, there are other changes that may affect the personnel available for the response. The potential reduction in the number of active pump stations affects the number of available personnel to staff the initial Incident Management Team (IMT). However, while the pool of people is smaller, the commitment to fill each IMT position remains. Another proposal of the amendments to the C-Plan is to reduce the number of Maintenance Coordinator positions from eight to seven.

Reconfiguration could reduce the risk for spills of crude oil and other petroleum products at the pump stations for several reasons. First, the frequency of transportation of fuel would be reduced because of more efficient energy generation at pump stations with their own generation capacity, and the possible connection to the local electrical grid at PS 1 and 9. Under reconfiguration, removal of many of the potential small spill avenues for crude oil at the pump stations, such as flanges, pumps, valves, underground pipes, refueling stations, etc., would also likely reduce the total number of oil spills at the pump stations. Reductions in workforce and maintenance requirements would reduce the number of small spills of oil or fuel from vehicles.

4.1.2.2 Mitigation and Conditions of Approval

The amendments include several offsets to impacts of moving and centralizing responders and equipment. Not all equipment will be moved from PS 3. Faster and heavier payload helicopters will be available at Glennallen, Delta Junction (PS 9 area), Fairbanks, and PS 4. Moving responders and equipment to a Glenallen response base will decrease effective response time to the Gulkana, Tazlina, Klutina, and Tiekel River areas. Improved response to the Gulkana River is especially noteworthy because of the river's salmon spawning beds and its WSR status. APSC has committed to improving containment sites that will be subject to longer response times so that it will take less time to implement a containment tactic.

The amendments state that three Oil Spill Response Coordinator positions will be added. APSC has also committed to doing a "Fate and Transport Study" in the affected areas to ascertain the behavior of spilled oil before it reaches any containment site. In addition, APSC has committed to updating the Capstone Risk Analysis to identify changes brought about by aspects of reconfiguration, including dynamic spill volume. On the basis of these studies, additional containment sites may be identified, equipment caches may be designated, and existing containment sites improved. The removal of equipment from PS 12 and the relocation of responders from PS 3 will not be implemented until the analysis is complete for their respective

regions, and it is determined what equipment, if any, should remain at this location to facilitate response or what other changes should be made.

The BLM and ADEC have approved the amendments with several conditions that further mitigate the impacts identified above. The Fate and Transport Study procedure is to be applied linewide. The BLM is developing an internal database available to all JPO agencies to identify resources at particular risk from oil spill impacts as well as response resources identified in the plan. The purpose is to facilitate a holistic analysis of response capability and recommend effective strategies. This will be implemented in concert with the analysis described in the preceding paragraph. The agencies will require that the Fate and Transport Study be expanded to the remainder of the pipeline.

The approval of the contingency plan also requires the following:

- A heavier lift helicopter for PS 5,
- Impermeable secondary containment for the new pump modules,
- A drill/exercise plan to emphasize any changes in response procedures, and
- Submission of a MOC plan prior to implementing major relocations of personnel.

4.1.2.3 Plan Implementation Issues

During the review of the amendments, JPO agencies were made aware that several issues existed concerning the implementation of the current C-Plan. One of these was that several of the response enhancements in the Copper River area were not completed, even though they were noted in the TAPS FEIS as completed. Another issue is the maintenance of existing containment sites. Resolution of these issues is required through the BLM annual plan approval.

4.1.3 Contaminated Sites

Spills (hydrocarbon and chemical) have occurred at the pump stations over time. Although each spill was remediated per the direction of regulatory authorities, the possibility exists that during facility replacement, some contaminated gravel would have to be removed and properly disposed of. Waste management would be controlled in accordance with APSC's Environmental Protection Manual (APSC 2003). Although the majority of spill events were remediated to the satisfaction of the regulatory authorities, some spill sites fall into one of the following two categories.

- Active — spill monitoring or remediation activities ongoing, and
- NFRAP — No Further Remedial Action Planned.

NFRAP sites are sites where remediation has progressed as far as possible but does not meet ADEC standards. For example, a spill that has migrated under a building cannot be totally cleaned up without compromising the building's integrity. There are a total of 38 sites at the pump stations. Some may need to be addressed during reconfiguration activities. Procedures for handling contaminated soils would be described in the Environmental Management Plan currently being developed by APSC. Table 9 shows the active and NFRAP sites at each pump station.

Some of these sites may be affected by reconfiguration and may need gravel extraction and treatment. Clean gravel may need to be placed into the excavated area; either the original gravel that has been remediated or gravel from a new clean source may be used.

4.2 NO ACTION

Impacts of the no action alternative would be the same as those presented in the TAPS FEIS (BLM 2002). Under the no action alternative, the proposed reconfiguration would not occur.

4.3 CUMULATIVE IMPACTS

Cumulative impact is *"… the impact on the environment that results from the incremental impact of the action under consideration when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions (40 CFR 1508.7)."* The TAPS FEIS (BLM 2002) for ROW renewal has an extensive discussion of the cumulative effects of TAPS operations for the 30-year renewal period. That discussion is incorporated in general in this EA by reference, except for the following.

Criteria pollutant emissions from the reconfigured pump stations would be less than those reported in the TAPS FEIS. The potential cumulative reduction in criteria air pollutant emissions from PS 1, PS 3, PS 4, and PS 9 would be 666 tons/yr for nitrogen oxides (NO_x), 2,502 tons/yr for carbon monoxide (CO), 73.1 tons/yr for particulate matter with a mean aerodynamic diameter of 10 µm or less (PM_{10}), and 173.7 tons/yr for sulfur dioxide (SO_2). This would be offset by emissions of criteria pollutants used to generate electric power for PS 1 and PS 9. If gas turbine generators were installed for PS 1 and PS 9, potential cumulative emissions of NO_x would

TABLE 9 Active and NFRAP Sites at Each Pump Station

Category	PS 1	PS 2	PS 3	PS 4	PS 5	PS 6	PS 7	PS 8	PS 9	PS 10	PS 12	Total
Active	3	1	2	1	3	2	1	1	1	1	2	18
NFRAP	3	2	2	1	1	3	0	1	3	4	0	20
Total open	6	3	4	2	4	5	1	2	4	5	2	38

increase by 222 tons/yr; potential cumulative emissions of CO would be reduced by 2,600 tons/yr; emissions of PM_{10} would be reduced by 51 tons/yr; and emissions of SO_2 would be reduced by 173 tons/yr. Placing PS 7 on standby would also reduce cumulative emissions of criteria pollutants from TAPS pump stations.

The commercial producers of power for PS 1 and 9 would be required to modify their air permits. If power is purchased from the Central Power Station, it is likely to require a change to its operating permits. If Gold Valley Electric Association would need to install a generating unit to provide power for PS 9, additional emissions from the utility would be generated. The exact changes in emissions cannot be determined until the type of unit needed could be determined.

The other activity that may occur in the vicinity of the TAPS pump stations is the potential construction of a natural gas pipeline. While the route for such a pipeline has not been determined, it could parallel some portion of the TAPS ROW. Reductions in air emissions, waste generation, and human activity at the TAPS pump stations would reduce the cumulative impact of combined operation of the two pipelines. Employment for construction of a natural gas pipeline would provide short-term stimulation to local economies, as would a small number of maintenance or other personnel needed for operating a natural gas pipeline in the vicinity of the TAPS ROW. This might partially offset impacts from any potential reductions in TAPS operational employment.

APSC, as part of C-Plan amendments, has committed to doing a Fate and Transport Study in the affected areas to ascertain the behavior of spilled oil before it reaches any containment site. APSC has also committed to updating the Capstone Risk Analysis to identify changes brought about by aspects of reconfiguration, including dynamic spill volume. The Fate and Transport Study procedure is to be applied linewide. The BLM is developing an internal database available to all JPO agencies to identify resources at particular risk from oil spill impacts as well as response resources identified in the plan. The purpose is to facilitate a holistic analysis of response capability and recommend effective strategies. This approach has the potential to provide improvements in protection to sensitive resources. some of which are impacted cumulatively by other non-TAPS-related actions.

4.4 MITIGATION

Mitigation measures discussed in the consequences analysis include elements to reduce impacts to surface water, habitats, birds and mammals, and the consequences of spills.

APSC would reconfigure the pump stations without loss of additional wildlife habitat. All activities would occur in existing road ROWs and within the current boundaries of the pump stations.

To prevent the risk of fire during a potential petroleum leak from the new equipment, the surface would be graded to guide any liquids not captured by the sump system away from the pump modules. However, impermeable secondary containment for the new pump modules

would be installed to facilitate cleanup and to prevent migration of petroleum products from reaching surface and groundwater.

Alternative means of sanitary waste disposal would be employed for any periods of time during construction when sanitary waste production by the workforce would exceed on-site treatment capacity. If stack injection is no longer possible at PS 1 and 4, sanitary wastes would be hauled to treatment facilities at Prudhoe Bay (PS 1) or Fairbanks (PS 4) for treatment.

Dust abatement practices would be followed during construction activities.

Activities that could potentially disturb nesting migratory birds at the pump stations, or migratory birds and threatened and endangered species in the vicinity of the pump stations, would be timed to avoid nesting periods. APSC would continue to implement procedures that would reduce interactions or conflicts between station operations and wildlife, including both small and large mammals.

APSC is developing a project-specific MOC plan for implementation of the strategic reconfiguration. This plan will address the steps necessary to minimize risks associated with nonroutine operations during the transition phase from construction to operations.

Section 4.1.2.2 discusses the measures that are included in the C-Plan to mitigate the potential environmental risks from changes in spill response during reconfigured operations. The BLM and ADEC have approved the amendments to the C-Plan with several conditions, including application of the Fate and Transport Study procedure linewide. To facilitate a holistic analysis of response capability and effective strategies, the BLM is developing an internal database available to all JPO agencies to identify resources at particular risk from oil spill impacts as well as response resources identified in the plan. BLM approval of the C-Plan also requires the following:

- A heavier lift helicopter for PS 5,
- Impermeable secondary containment for the new pump modules,
- A drill/exercise plan to emphasize any changes in response procedures, and
- Submission of a MOC plan prior to implementing major relocations of personnel.

4.5 OTHER NEPA CONSIDERATIONS

Unavoidable adverse impacts of strategic reconfiguration of the TAPS would be similar to those identified in the TAPS FEIS. However, air emissions, water use, and waste generation would be reduced in the long term.

Equipment and facilities removed during strategic reconfiguration would be recycled to the extent practicable, thus reducing an irretrievable and irreversible commitment of resources. More efficient equipment at the reconfigured pump stations would reduce the use of fossil fuel.

Strategic reconfiguration of the TAPS would result in short-term increases in adverse impacts due to construction; however, reconfiguration would result in future long-term reductions in TAPS operational impacts.

5 REFERENCES

ADEC (Alaska Department of Environmental Conservation), 1996a, *Air Quality Control Permit to Operate No. 9572-AA012, Alyeska Pump Station #1*, Division of Air and Water Quality, Air Quality Maintenance Section, Juneau, Alaska, March 4 (as amended on Sept. 5, 1996).

ADEC, 1996b, *Air Quality Control Permit to Operate No. 9572-AA011, Alyeska Pump Station #2*, Division of Air and Water Quality, Air Quality Maintenance Section, Juneau, Alaska, March 4.

ADEC, 1996c, *Air Quality Control Permit to Operate No. 9572-AA010, Alyeska Pump Station #3*, Division of Air and Water Quality, Air Quality Maintenance Section, Juneau, Alaska, March 4.

ADEC, 1996d, *Air Quality Control Permit to Operate No. 9572-AA009, Alyeska Pump Station #4*, Division of Air and Water Quality, Air Quality Maintenance Section, Juneau, Alaska, March 4.

ADEC, 1996e, *Air Quality Control Permit to Operate No. 9572-AA008, Alyeska Pump Station #6*, Division of Air and Water Quality, Air Quality Maintenance Section, Juneau, Alaska, March 4.

ADEC, 1996f, *Air Quality Control Permit to Operate No. 9572-AA007, Alyeska Pump Station #7*, Division of Air and Water Quality, Air Quality Maintenance Section, Juneau, Alaska, March 4.

ADEC, 1996g, *Air Quality Control Permit to Operate No. 9572-AA006, Alyeska Pump Station #8*, Division of Air and Water Quality, Air Quality Maintenance Section, Juneau, Alaska, March 4.

ADEC, 1996h, *Air Quality Control Permit to Operate No. 9572-AA005, Alyeska Pump Station #9*, Division of Air and Water Quality, Air Quality Maintenance Section, Juneau, Alaska, March 4.

ADEC, 1996i, *Air Quality Control Permit to Operate No. 9572-AA004, Alyeska Pump Station #10*, Division of Air and Water Quality, Air Quality Maintenance Section, Juneau, Alaska, March 4.

ADEC, 1996j, *Air Quality Control Permit to Operate No. 9572-AA003, Alyeska Pump Station #12*, Division of Air and Water Quality, Air Quality Maintenance Section, Juneau, Alaska, March 4.

ADEC, 1996k, *Air Quality Control Permit to Operate No. 9671-AA001, for Valdez Marine Terminal*, Division of Air and Water Quality, Air Quality Maintenance Section, Juneau, Alaska, June 7.

American Petroleum Institute, 2003, *Centrifugal Pumps for Petroleum, Petrochemical, and Natural Gas Industries*, Standard 610, Washington, D.C.

APSC (Alyeska Pipeline Service Company), 1990a, *Prevention of Significant Deterioration Permit Application, Pump Station #2*, Anchorage, Alaska, Oct.

APSC, 1990b, *Prevention of Significant Deterioration Permit Application, Pump Station #7 Rim Cooling Project*, Anchorage, Alaska, Oct.

APSC, 1991, *Fuel Sulfur, Proposed Changes to Draft Compliance Order and Modeling Summary Report*, Anchorage, Alaska, May.

APSC, 1997, *Final Report for Dispersion Modeling of a Generic Pump Station along the Trans Alaska Pipeline*, Anchorage, Alaska, June.

APSC, 2003, *Environmental Protection Manual*, EN-43-00X4, 7th ed., Anchorage, Alaska.

Brendel, J., 2003, *Emissions Rate Comparison for Pump Stations 1, 3, 4, and 9*, personal communication from J. Brendel (Alyeska Pipeline Service Company, Anchorage, Alaska) to E.A. Stull and K. Wescott (Argonne National Laboratory, Argonne, Ill.), Dec. 10.

BLM (Bureau of Land Management), 2002, *Final Environmental Impact Statement Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way*, United States Department of the Interior, Bureau of Land Management, Anchorage, Alaska. Available at http://tapseis.anl.gov/documents/eis/index.cfm.

BLS (U.S. Bureau of Labor Statistics), 2003, *Local Area Unemployment Statistics*, Washington, D.C. Available at ftp://ftp.bls.gov/pub/time.series/la/.

DeWandel, S., 2001, personal communication from DeWandel to E. Haas (HMH Consulting, LLC, Anchorage, Alaska), Oct. 4.

EPA, 2001a, *Compilation of Air Pollutant Emission Factors, Vol. I: Stationary Point and Area Sources*, AP-42, 5th Ed. Available at http://www.epa.gov/chief/ap42.html. Accessed Oct. 20, 2001.

EPA, 2001b, *Alaska Air Quality Monitors for Particulate Matter and Carbon Monoxide (All Years), AIRData — Monitor Values Report*. Available at http://www.epa.gov/ttn/scarm. Accessed Oct. 20, 2001.

Fluor and TRC (Fluor Daniel Inc. and TRC Environmental Corporation), 1995, *Application for Prevention of Significant Deterioration Approval and Air Quality Control Permit to Operate Valdez Marine Terminal Vapor Control Project*, prepared for Alyeska Pipeline Service Company, Anchorage, Alaska, July.

HMH, 2001, *Williams Alaska Petroleum North Pole Refinery, Ambient Air Quality and Meteorological Monitoring Program, Annual Summary Report, February 1, 2000–January 31, 2001*, prepared for Alaska Department of Environmental Conservation, Anchorage, Alaska, March 14.

Norton, J.D., 2001, personal communication from Norton (TAPS Owners ROW Renewal Team, Anchorage, Alaska) to K.C. Chun (Argonne National Laboratory, Argonne, Ill.), Dec.

SECOR (SECOR International, Inc.), 1995, *Analysis of Data Applicability for the Alaska North Slope Air Quality Management Program, Badami Development Project*, prepared for BP Exploration (Alaska) Inc., Fort Collins, Colo., March.

Thomas, B., 2002, personal communication from Thomas (Alyeska Pipeline Service Company, Valdez, Alaska) to K.C. Chun (Argonne National Laboratory, Argonne, Ill.), April 29.

OASIS (OASIS Environmental, Inc.), 2003, *Strategic Reconfiguration – Permit and Compliance Analysis*, Anchorage, Alaska.

TAPS Owners (Trans Alaska Pipeline System Owners), 2001, *Environmental Report for Trans Alaska Pipeline System Right-of-Way Renewal*, Anchorage, Alaska.

TAPS Owners, 2003a, *2003 Trans-Alaska Pipeline System (TAPS) Pipeline Oil Discharge Prevention and Contingency Plan (C-Plan) Amendment Application*, Anchorage, Alaska, Aug. 18.

TAPS Owners, 2003b, *2003 Trans-Alaska Pipeline System Pipeline Oil Discharge Prevention and Contingency Plan (C-Plan) Amendment Application and Response to Request for Additional Information*, Anchorage, Alaska, Oct. 31.

U.S. President, 1994, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," Executive Order 12898, *Federal Register* 59:7629, Feb. 16.

6 CONSULTATIONS

The following agencies, organizations, and persons were consulted:

- National Marine Fisheries Service Alaska Region, and
- U.S. Fish and Wildlife Service.

Copies of the consultation letters follow.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
411 West 4th Avenue
Anchorage, Alaska 99501
http://www.ak.blm.gov

TAKE PRIDE IN AMERICA

DEC 3 1 2003

Letter No.: 03-046-JS
Case File Serial No.: AA 5847
Section/Stipulation: Section 10
Facility Code: F4010
DD.: N/A

Mr. James W. Balsiger, Administrator
National Marine Fisheries Service Alaska Region
P.O. Box 21668
Juneau, AK 99802-1668

Dear Mr. Balsiger,

The U.S. Department of Interior, Bureau of Land Management (BLM), is completing an environmental assessment (EA) for a strategic reconfiguration of the pump stations of the Trans-Alaska Pipeline System (TAPS). This letter is to request informal consultation with your agency in accordance with the Endangered Species Act and the Magnuson-Stevens Fishery Conservation and Management Act.

As the result of declining production of oil from the Prudhoe Bay Oil Field and advances in pipeline technology since the construction of the TAPS, the Alyeska Pipeline Service Company identified potential upgrades and reconfigurations to the pipeline that would give it flexibility to operate and maintain the pipeline more efficiently. The primary focus of the TAPS reconfiguration upgrades would include replacement of power and pump systems at pump stations; automation of pump station control activities; improved voice and data communications systems; unmanned pump stations and remote security devices; and use of a regional center concept for maintenance and oil spill response. The proposed strategic reconfiguration applies only to the pump stations and not the mainline pipe, the Valdez Marine Terminal, or any of the other components of the TAPS.

A final environmental impact statement (FEIS) was issued by the BLM in November 2002 that addressed the impacts of a 30-year renewal of the Federal Grant for the TAPS Right-of-Way. A Record of Decision to renew the Grant for 30 years was signed in January of 2003. The possibility of future upgrades, including pump station upgrades, were discussed in the FEIS, but detailed information regarding the upgrades was not available at that time. During the renewal process, BLM consulted with your agency, and BLM produced a biological evaluation (BE) that found that the proposed action (renewal) would not likely adversely affect any of the

2004/0106-7

five species under consideration and that no designated critical habitat exists within the action area. The original BE is attached for your consideration.

The EA will be sent to your agency within the next few weeks for your review and comment. As the reconfiguration and modernization proceeds, BLM will fully comply with the findings and recommendations provided by your agency during the recent renewal process, as well as all stipulations contained in the current Federal Grant. Based on consultations with your agency during the recent renewal process for the Federal Grant, BLM believes that formal consultation will not be required for this TAPS pump station upgrade project.

Sincerely,

Jerry Brossia
Authorized Officer

Enclosure(s):
TAPS Biological Evaluation

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
411 West 4th Avenue
Anchorage, Alaska 99501
http://www.ak.blm.gov

TAKE PRIDE IN AMERICA

DEC 3 1 2003

Letter No.: 03-045-JS
Case File Serial No.: AA 5847
Section/Stipulation: Section 10
Facility Code: F4010
DD.: N/A

Mr. Patrick J. Sousa
Field Supervisor
Northern Alaska Ecological Services
U.S. Fish and Wildlife Service
Fairbanks, Alaska 99701

Dear Mr. Sousa,

The U.S. Department of Interior, Bureau of Land Management (BLM), is completing an environmental assessment (EA) for a strategic reconfiguration of the pump stations of the Trans-Alaska Pipeline System (TAPS). This letter is to request informal consultation with your agency in accordance with the Endangered Species Act and the Magnuson-Stevens Fishery Conservation and Management Act.

As the result of declining production of oil from the Prudhoe Bay Oil Field and advances in pipeline technology since the construction of the TAPS, the Alyeska Pipeline Service Company identified potential upgrades and reconfigurations to the pipeline that would give it flexibility to operate and maintain the pipeline more efficiently. The primary focus of the TAPS reconfiguration upgrades would include replacement of power and pump systems at pump stations; automation of pump station control activities; improved voice and data communications systems; unmanned pump stations and remote security devices; and use of a regional center concept for maintenance and oil spill response. The proposed strategic reconfiguration applies only to the pump stations and not the mainline pipe, the Valdez Marine Terminal, or any of the other components of the TAPS.

A final environmental impact statement (FEIS) was issued by the BLM in November 2002 that addressed the impacts of a 30-year renewal of the Federal Grant for the TAPS Right-of-Way. A Record of Decision to renew the Grant for 30 years was signed in January of 2003. The possibility of future upgrades, including pump station upgrades, was discussed in the FEIS, but detailed information regarding the upgrades was not available at that time. During the renewal process, BLM consulted with your agency, and BLM produced a biological evaluation

20041016 - 6

(BE) that found that the proposed action (renewal) would not likely adversely affect any of the five species under consideration, and that no designated critical habitat exists within the action area. The original BE is attached for your consideration.

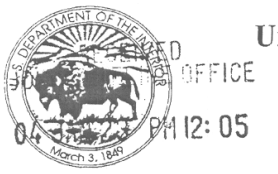
The EA will be sent to your agency within the next few weeks for your review and comment. As the reconfiguration and modernization proceeds, BLM will fully comply with the findings and recommendations provided by your agency during the recent renewal process, as well as all stipulations contained in the current Federal Grant. Based on consultations with your agency during the recent renewal process for the Federal Grant, BLM believes that formal consultation will not be required for this TAPS pump station upgrade project.

Sincerely,

Jerry Brossia
Authorized Officer

Enclosure(s):
TAPS Biological Evaluation

Sec 7g/2L



United States Department of the Interior
Fish and Wildlife Service
Fairbanks Fish and Wildlife Office
101 12th Ave., Box 19, Room 110
Fairbanks, Alaska 99701
January 20, 2004

Jerry Brossia
Bureau of Land Management
411 West 4th Avenue
Anchorage, AK 99501

Re: Trans Alaska Pipeline System
Upgrades

Dear Mr. Brossia:

This responds to your request for a list of endangered and threatened species and critical habitats pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act). This information is being provided for proposed upgrades and reconfigurations to the Trans Alaska Pipeline System (TAPS). The proposed TAPS reconfiguration upgrades include replacement of power and pump systems at pump stations, automation of pump station control activities, improved voice and data communications systems, unmanned pump stations and remote security devices, and use of a regional center concept for maintenance and oil spill response.

In Northern Alaska, no listed species occur in the project areas and there is no designated or proposed critical habitat in the vicinity of the proposed project. Therefore, the Service concludes that this project is not likely to adversely impact listed species. Preparation of a Biological Assessment or further consultation under section 7 of the Act regarding this project is not necessary.

This letter applies only to endangered and threatened species under our jurisdiction. It does not preclude the need to comply with other environmental legislation or regulations such as the Clean Water Act.

Thank you for your cooperation in meeting our joint responsibilities under the Act. If you need further assistance, please contact Jonathan Priday at (907) 456-0499.

Sincerely,

Philip Martin
Acting Branch Chief
Endangered Species

2004/0126-1

7 LIST OF PREPARERS

John Kupar	Argonne National Laboratory
Elisabeth Stull	Argonne National Laboratory
Konstance Wescott	Argonne National Laboratory
Mike Wrabetz	Joint Pipeline Office