Eastern Access Road Study
North Slope, Alaska

April 2026

Prepared for

Alaska Industrial Development and Export Authority
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Revision History and Approval

Rev. No.	Date	Client	Author	Peer Reviewer	Technical Editor	QC Reviewer	PM	Notes
0	4/9/26	AIDEA	P. Ramert	E. Tifental	L. Oswald	A. Henry	P. Ramert	Issued Final

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Table of Contents

List of Tables and Figures

TABLES

FIGURES

List of Appendices

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Acronyms and Abbreviations

1002 Area	Coastal Plain of ANWR, also known as Section 1002 Area
3D	three-dimensional
AAC	Alaska Administrative Code
AASHTO	American Association of State Highway and Transportation Officials
ACECs	Areas of Critical Environmental Concern
ACES	ASRC Consulting & Environmental Services, LLC
ADF&G	Alaska Department of Fish and Game
ADL	Alaska Division of Lands
ADN	Anchorage Daily News
ADNR	Alaska Department of Natural Resources
ADOT&PF	Alaska Department of Transportation and Public Facilities
AGDC	Alaska Gasline Development Corporation
AHRS	Alaska Heritage Resources Survey
AIDEA	Alaska Industrial Development and Export Authority
ANCSA	Alaska Native Claims Settlement Act
ANWR	Arctic National Wildlife Refuge
AOGCC	Alaska Oil and Gas Conservation Commission
APM	Alaska Public Media
AS	Alaska Statute
ASRC	Arctic Slope Regional Corporation
bbl/d	barrels per day
BBO	billion barrels of oil
Bcf	billion cubic feet
BIA	U.S. Bureau of Indian Affairs
BLM	U.S. Bureau of Land Management
BOEM	U.S. Bureau of Ocean Energy Management
BP	British Petroleum
CDL	commercial driver's license
CFR	Code of Federal Regulations
CIR	color infrared
CWA	Clean Water Act

CWAT	Community Winter Access Trail
cy	cubic yard(s)
DEC	Alaska Department of Environmental Conservation
DEM	Digital Elevation Model
DGGS	Alaska Division of Geological & Geophysical Surveys
DOG	Department of Oil and Gas (ADNR)
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FLIR	forward-looking infrared
FR	Federal Register
ft	foot/feet
GIS	Geographic Information System
GPTU	Greater Point Thomson Unit
Hilcorp	Hilcorp Alaska, LLC
HUC	Hydrologic Unit Code
ICAS	Iñupiat Community of the Arctic Slope
KIC	Kaktovik Iñupiat Corporation
lb	pound(s)
LDA	Legislatively Designated Area
LiDAR	light detection and ranging
LNG	liquefied natural gas
m	meter(s)
MBTA	Migratory Bird Treaty Act
MMbo	million barrels of oil
MMcf	million cubic feet
MMPA	Marine Mammal Protection Act
MP	milepost
NA	not applicable
NGL	natural gas liquid
NPR-A	National Petroleum Resource–Alaska
NSAP	North Slope Area Plan
NSB	North Slope Borough
NWI	National Wetlands Inventory

O&G	oil and gas
OHA	Office of History and Archaeology
POE	Plan of Exploration
PTU	Point Thomson Unit
QA/QC	quality assurance and quality control
ROM	rough order of magnitude
ROW	right-of-way
Sag River	Sagavanirktok River
SRBA	Stephen R. Braund & Associates
TAPS	Trans-Alaska Pipeline System
Tcf	trillion cubic feet
Thought Process	USACE Alaska District Compensatory Mitigation Thought Process
TLUI	Traditional Land Use Inventory
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VSM	vertical support member
WERC	Water and Environmental Research Center
WOUS	Waters of the United States

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Executive Summary

This study evaluates potential alignment alternatives for an all-season gravel road extending eastward from the Dalton Highway and the Prudhoe Bay Unit to the vicinity of Point Thomson and the western boundary of the Arctic National Wildlife Refuge (ANWR). The proposed roadway would improve year-round access to known and potential oil and gas (O&G) resources on the eastern North Slope of Alaska. The study was prepared by ASRC Consulting & Environmental Services, LLC (ACES) for the Alaska Industrial Development and Export Authority (AIDEA).

Currently, access to the eastern North Slope is limited primarily to seasonal ice roads during winter or marine transport during the summer open-water season. These seasonal access methods increase logistical complexity and constrain the timing of exploration and development activities. An all-season road could improve the efficiency of transporting personnel, equipment, and supplies and could reduce the overall cost and risk associated with exploration, development, and long-term operations in the region.

The study area extends from the Dalton Highway and the Prudhoe Bay Unit eastward to the vicinity of Point Thomson and the western boundary of ANWR. The Beaufort Sea coastline forms the northern boundary of the study area, while the southern boundary is defined by latitude 69.2° N. Within this region, numerous O&G pools, lease blocks, exploration prospects, and existing infrastructure indicate substantial potential for continued exploration and development.

The objective of this study is to identify feasible roadway alignments that maximize access to known and potential O&G resources while minimizing construction costs and environmental impacts. The analysis considers previously proposed access corridors, engineering design assumptions, land ownership and environmental constraints, and potential gravel material sources.

Several potential route corridors were initially identified and screened using available geographic information system (GIS) datasets, published studies, and publicly available infrastructure and resource data. Screening criteria included access to known O&G pools and lease areas, environmental and cultural resource constraints, land ownership considerations, river crossing locations, and construction feasibility. Routes were also evaluated based on their proximity to existing infrastructure and potential gravel sources.

Three coastal route alternatives were identified for further evaluation. Each alignment generally follows higher ground along the coastal plain to reduce impacts to wetlands and minimize the number and size of water crossings. Preliminary engineering assumptions and rough order-of-magnitude (ROM) construction cost estimates were developed for each alternative. Key differentiating factors among the routes include total route length, bridge requirements, access to O&G resources, and estimated construction cost. Because this analysis is based on publicly available information and planning-level engineering assumptions, the results should be considered preliminary and subject to refinement during future engineering and environmental studies.

Routes A and B originate near the existing Endicott Road and extend eastward toward Point Thomson. Route C originates near Deadhorse along the Dalton Highway before extending eastward toward Point Thomson. Routes A and B are similar in total length and provide comparable access to O&G reserves and lease areas. Route B has the lowest estimated construction cost due primarily to a shorter cumulative bridge length. Route A is located closer to existing pipeline corridors and Badami infrastructure, which may provide logistical advantages for operations, maintenance, inspection, and spill response. Route C is longer, requires additional bridge crossings, and has a substantially higher estimated construction cost. (Routes are shown in Figure 7-1 in Section 7.0.)

Based on available information, Routes A and B appear to provide the most favorable balance of construction feasibility, infrastructure connectivity, and access to O&G resources. Both alternatives provide comparable access to reserves and lease areas while maintaining shorter route lengths and lower estimated construction costs compared to Route C. At this planning stage, however, the analysis does not identify a single preferred alternative.

This study provides a preliminary planning-level assessment of potential roadway alignments and establishes a baseline for future project development. If the project advances, additional work would be required to refine the proposed alignments and evaluate project feasibility in greater detail. Key next steps would include stakeholder engagement with affected communities and land management agencies, refinement of engineering alignments using improved topographic and geotechnical data, environmental and cultural resource field studies, updated cost estimates, and an economic analysis evaluating the potential benefits of improved year-round transportation access to O&G resources on the eastern North Slope.

1.0 INTRODUCTION

This study evaluates potential alignment alternatives for an all-season gravel road extending eastward from the Dalton Highway and the Prudhoe Bay Unit to the vicinity of Point Thomson and the boundary of the Arctic National Wildlife Refuge (ANWR), providing access to known and potential oil and gas (O&G) reserves. This study was prepared by ASRC Consulting & Environmental Services, LLC (ACES) for the Alaska Industrial Development and Export Authority (AIDEA) under Contract 21031, NTP No. 16. During preparation of this study, ACES coordinated with Mr. Kelly Noble and Mr. Kelvin Goode of AIDEA.

1.1 Objective

The objective of this study is to identify feasible road alignments that maximize access to known and potential O&G reserves while simultaneously constraining costs and minimizing impacts on natural and cultural resources. The project concept is a two-lane gravel road similar to the Spine Road that traverses Greater Prudhoe Bay and Kuparuk. The proposed road will extend eastward to provide access to numerous O&G pools, lease blocks, units, and facilities through spur roads or pads extending from the main access road. The all-season road would provide significant logistical advantages and cost savings for the movement of workers, supplies, and equipment. Currently, access to the eastern North Slope occurs via ice roads during winter or by barging along the coastline during the summer open-water season.

The study process includes identifying the potential O&G resources within the study area, identifying feasible alternatives for roadway access to the resources, and estimating the cost and potential benefits of such access to the State of Alaska and the O&G industry. An all-season road is expected to reduce the cost of exploration and development in the area and lead to greater economic activity for the state.

The roadway is expected to primarily serve industrial traffic; however, residents of Kaktovik will likely desire to use the road when traveling between Kaktovik and the Dalton Highway.

1.2 Study Area

For the purpose of identifying and assessing potential road alignments, the study area is bounded on the west by the Dalton Highway and the Prudhoe Bay Unit boundary, on the north by the Beaufort Sea coastline, on the east by the ANWR boundary, and on the south by latitude 69.2° N (Figures 1-1 and 1-2). The western boundary coincides approximately with Dalton Highway mileposts (MPs) 338–410.5 (at Deadhorse) and with the Trans-Alaska Pipeline System (TAPS) MP 15–77.5 (near Pump Station 1 to MP 77.5).

Despite these boundaries, when considering access to O&G resources, the potential of adjacent areas outside the study area boundary will also be considered. For example, an all-season road could affect exploration and development of offshore discoveries in the adjacent Beaufort Sea and in the adjacent Section 1002 Area of ANWR.

1.3 Land Use Plan

Since the alternative roadway alignments will traverse primarily across state-owned lands, the study will be consistent with the goals, objectives, and management guidelines of the Alaska Department of Natural Resources' (ADNR's) *North Slope Area Plan* (NSAP) (2021). The NSAP is the land use plan for state-owned, state-selected, and top-filed lands in the area. The plan establishes goals, objectives, management guidelines, and land classifications that apply to all state lands within the planning area. Goals relevant to potential roadway development within the study area are discussed further in Section 5.3 of this report.

1.4 Report Organization

The methodologies and findings of this report are presented in 11 chapters, briefly summarized below.

1. **Introduction**: Introduces the study objective, study area, and the relevant land use plan for the area.
2. **Oil and Gas Resources**: Describes O&G resources, discoveries, development, infrastructure, and potential O&G reserves within and near the study area, as well as the outlook for future O&G activity.
3. **Benefits of the Proposed Road**: Discusses the benefits that could be realized by the industry and the State of Alaska from construction of the corridor.
4. **Previously Considered Routes**: Review of previously considered routes, key components and limitations.
5. **Roadway Assumptions and Considerations:** Describes the general assumptions and considerations for road design, use, and planning.
6. **Land, Environmental, and Cultural Resources**: Outlines GIS inputs and available datasets used to develop route alternatives, including land tenure, environmental, cultural, and other constraints that may affect the routing.
7. **Route Identification and Preliminary Screening**: Describes the various roadway alignments being considered and the preliminary screening of alternative alignments to pare down the number retained for detailed analysis.
8. **Cost Estimates**: Provides Class 5 cost estimates for the construction of alternative road alignments.

9. **Analysis of Alternatives**: Summarizes benefits and constraints for each road alignment alternative and ranks the alternatives in a comparative analysis.
10. **Summary and Next Steps**: Describes the conclusions of the study and provides recommendations for next steps.
11. **References**: Lists the sources cited in this report.

Two appendices are provided. Appendix A presents a list of all wells in the study area. Appendix B provides a summary of the North Slope Area Plan units within the study area.

Figures are provided at the end of each section where they are first cited.

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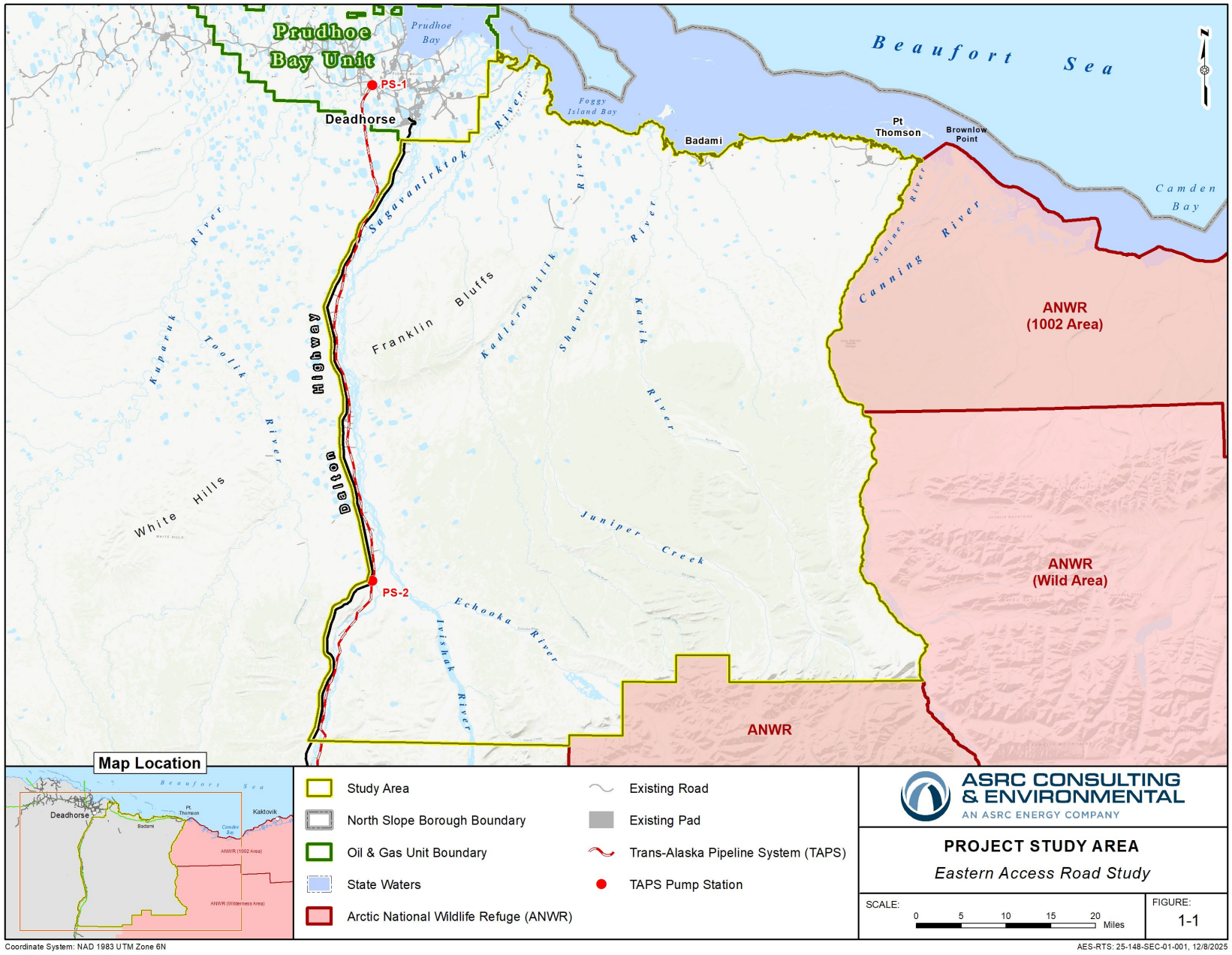
Prudhoe Bay Unit
Prudhoe Bay
PS-1
Deadhorse
Beaufort Sea
Foggy Island Bay
Badami
Pt Thomson
Brownlow Point
Camden Bay
Sagavanirktok River
Kuparuk River
Toolik River
Franklin Bluffs
Kadleroshilik River
Sharlovik River
Kavik River
Canning River
Staines River
Dalton Highway
White Hills
Juniper Creek
Echooka River
Ivishak River
PS-2
ANWR (1002 Area)
ANWR (Wild Area)
ANWR
Map Location
Kaktovik
Study Area
North Slope Borough Boundary
Oil & Gas Unit Boundary
State Waters
Arctic National Wildlife Refuge (ANWR)
Existing Road
Existing Pad
Trans-Alaska Pipeline System (TAPS)
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
PROJECT STUDY AREA
Eastern Access Road Study
SCALE:
0 5 10 15 20 Miles
FIGURE:
1-1
Coordinate System: NAD 1983 UTM Zone 6N
AES-RTS: 25-148-SEC-01-001, 12/8/2025

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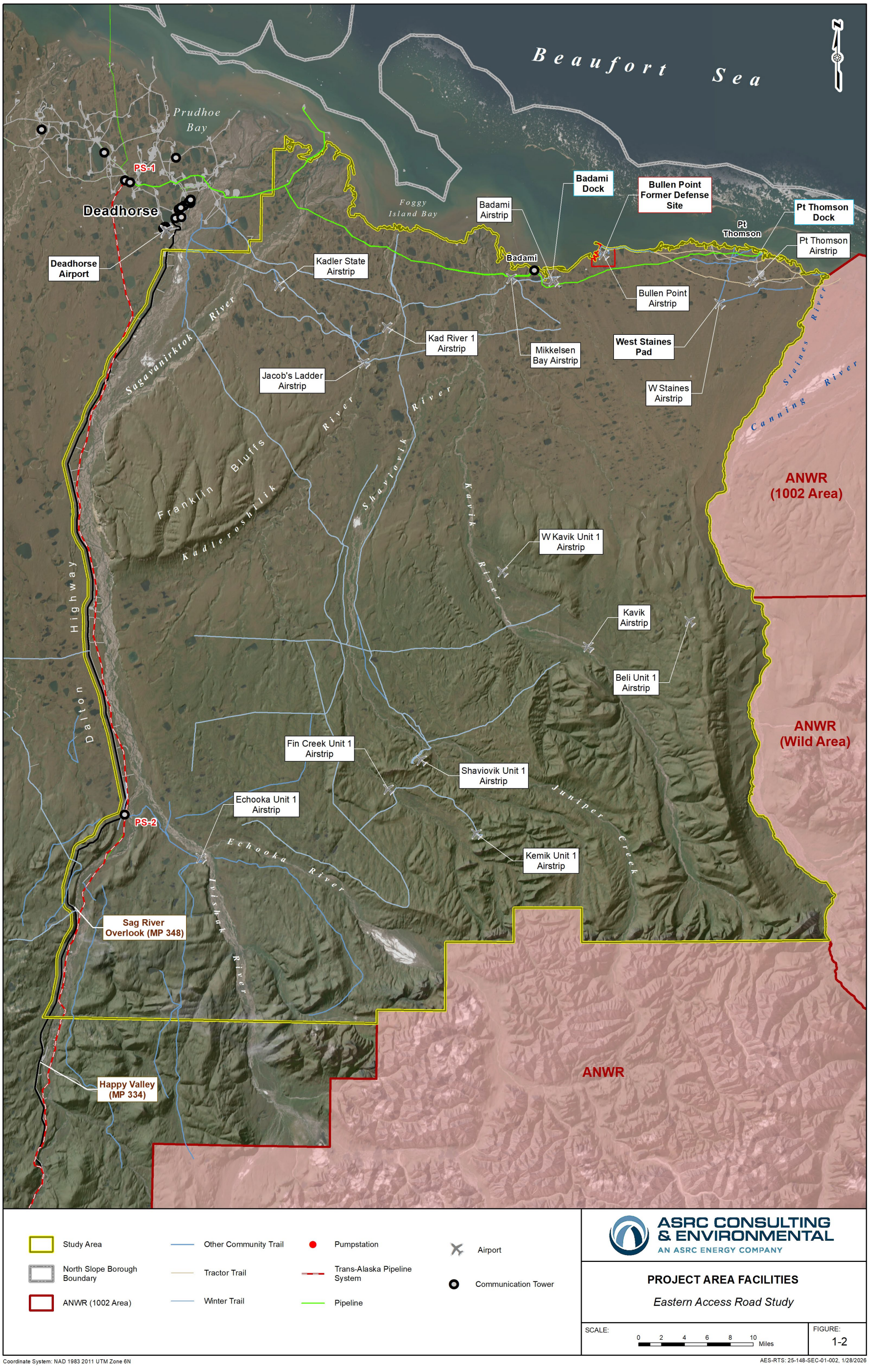
Beaufort Sea
Prudhoe Bay
Foggy Island Bay
PS-1
Deadhorse
Deadhorse Airport
Badami
Badami Airstrip
Badami Dock
Bullen Point Former Defense Site
Bullen Point Airstrip
Pt Thomson
Pt Thomson Dock
Pt Thomson Airstrip
Kadler State Airstrip
Kad River 1 Airstrip
Mikkelsen Bay Airstrip
West Staines Pad
W Staines Airstrip
Jacob's Ladder Airstrip
Sagavanirktok River
Franklin Bluffs
Kadleroshilik River
Shaviovik River
Kavik River
Staines River
Canning River
ANWR (1002 Area)
W Kavik Unit 1 Airstrip
Kavik Airstrip
Beli Unit 1 Airstrip
Fin Creek Unit 1 Airstrip
Shaviovik Unit 1 Airstrip
Echooka Unit 1 Airstrip
Kemik Unit 1 Airstrip
Juniper Creek
Echooka River
Ivishak River
Dalton Highway
PS-2
Sag River Overlook (MP 348)
Happy Valley (MP 334)
ANWR (Wild Area)
ANWR
Study Area
North Slope Borough Boundary
ANWR (1002 Area)
Other Community Trail
Tractor Trail
Winter Trail
Pumpstation
Trans-Alaska Pipeline System
Pipeline
Airport
Communication Tower
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
PROJECT AREA FACILITIES
Eastern Access Road Study
SCALE: 0 2 4 6 8 10 Miles
FIGURE: 1-2
Coordinate System: NAD 1983 2011 UTM Zone 6N
AES-RTS: 25-148-SEC-01-002, 1/28/2026

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2.0 OIL AND GAS RESOURCES

The eastern North Slope contains abundant hydrocarbon resources and has significant exploration and development potential. O&G exploration and development in the study area dates back to the 1960s and encompasses 206 recorded wells. A comprehensive table of these wells is provided in Appendix A, and locations of key exploration wells are shown in Figure 2-1.

Although not all of these wells led to production, they have provided important subsurface data about the study area's resource potential. Several O&G accumulations and development units have been identified within or near the study area (Figures 2-2 and 2-3), including the following:

- Oil pools currently producing: Badami, Point Thomson, and Alkaid
- Known gas pools: Kavik, Kemik, and Point Thomson
- O&G units located fully or partially within or offshore of the study area: Duck Island, Liberty, Badami, Point Thomson, Greater Point Thomson, Grey Owl, Toolik River, and Alkaid

A small portion of the Talitha Unit also falls within the study area; however, because nearly all the unit lies west of the Dalton Highway, it is not included in the access analysis. Several other discoveries are awaiting development, and new O&G resources are continually being discovered through exploratory drilling, including the recently announced King Street and Sockeye wells.

The following subsections describe O&G units, key wells, production, infrastructure, and planned exploration within the study area, the adjacent offshore environment of the Beaufort Sea, and the Section 1002 Area of ANWR. Current O&G leases and leaseholders are shown in Figure 2-3.

2.1 Oil and Gas Units

Duck Island Unit: Located offshore of the northwestern part of the study area, the Duck Island Unit comprises several participating areas, including Endicott, Eider, and Sag Delta North. Endicott's operations are located on two artificial islands within state waters. Discovered in 1978 and developed in 1986 by British Petroleum (BP), Endicott was the first offshore Arctic oil development (Hartz et al. 2004). BP sold Endicott to Hilcorp Alaska, LLC (Hilcorp) in 2014.

Liberty Unit: The Liberty Unit is currently inactive after federal regulators denied a lease extension in January 2025 (K. Nelson 2025). The leases, once held by Hilcorp, have expired, and the project is considered defunct. Additional information about the history and potential of the Liberty Unit is provided in Section 2.3 – Offshore Exploration.

Badami Unit: Conoco and PetroFina S.A. discovered oil in the Badami No. 1 well in 1990. BP originally acquired an interest in Badami in 1993, and an additional interest in 1994. Development of the Badami Unit was completed by BP in 1998. Badami is currently operated by Cook Inlet Energy, a

subsidiary of Glacier Oil & Gas Corp. From April 2024 to March 2025, Badami's production averaged 2,000 barrels per day (bbl/d) (Rosen 2025). Current plans for Badami include drilling the Killian development well, named after the targeted Killian sand formation, into the Steller Prospect during winter 2025–2026, and constructing the Badami East Pad in summer 2026 (Cashman 2025a).

Badami production facilities (ADN 2014)

Production facilities at Badami include multistage oil/water/gas separation, water injection, gas treatment, compression and injection, oil export facilities, water-alternating-gas injection, and a lift-gas system. Additional Badami infrastructure includes an airstrip, dock, a Class 1 nonhazardous waste disposal well, a grind-and-inject disposal well, a source for electrical power, an on-site gravel mine, and utility and oil pipelines that connect Badami to the Endicott pipelines (Kaltenbach et al. 2004; Cashman 2025a; ADNR Division of Oil and Gas [DOG] 2025a).

Point Thomson Unit: Point Thomson oil was discovered by ExxonMobil in 1975 at the Alaska State A-1 well on nearby Flaxman Island, followed 2 years later by the discovery of gas (Offshore Technology 2016). In 1977, Exxon formed the Point Thomson Unit. By 1983, 17 wells had been drilled, further delineating the Point Thomson pool (Nelson 2016). The field is estimated to hold approximately 25 percent of Alaska's North Slope natural gas resources (Offshore Technology 2016; Nelson 2016). Production started in 2016; and in 2022 operations were assumed by minority owner Hilcorp (Offshore Technology 2016; Anderson 2022). Currently, gas condensate is the only product exported from Point Thomson; a 22-mile pipeline connects the field to TAPS, which then carries approximately 10,000 bbl/d of gas condensate south to Valdez. The site's facilities also produce natural gas; however, there is currently no way to deliver it to market. Instead, two injection wells work in tandem with a production well to cycle 200 million cubic feet (MMcf) of natural gas per day. The condensate is shipped out; the gas is reinjected into the reservoir.

Point Thomson Central Pad (APM 2021)

Point Thomson facilities include two pads, Central Pad and West Pad, connected by a gravel road system, with plans for a third pad, East Pad. Central Pad contains the central production facility, including gas injection, production, and disposal wells. West Pad houses development wells, as well as production and metering facilities. Point Thomson infrastructure also includes an airstrip, pier, gravel mine site, and a pipeline connecting the facility to Badami and on to

Endicott (Offshore Technology 2016). A new well is anticipated to be completed by 2026 (DeMarban 2025).

The Sourdough prospect is within the Point Thomson Unit and was initially discovered by BP, which drilled the Sourdough No. 2 well in 1994 and the Sourdough No. 3 well in 1996. The prospect was estimated to hold 100 million barrels (MMbo) of recoverable oil but was not pursued due to its remote location (Cashman 2024b). Current operator Jade Energy LLC conducted a three-dimensional (3D) seismic survey in 2018 and has continued technical studies and fieldwork in the area through 2023 (Cashman 2024a, 2024b). Jade submitted a lease plan of operation in 2023 to drill the Jade No. 1 exploration and delineation well in the winter of 2024 (ADNR 2023); however, it has yet to be drilled.

Greater Point Thomson Unit: The Greater Point Thomson Unit (GPTU), an offshore and onshore unit, was formed in late 2022 by Donkel Oil & Gas. The unit includes lease blocks in two separate areas (eastern and western acreage), both of which adjoin the boundary of the Hilcorp-operated Point Thomson Unit. Donkel submitted a Plan of Exploration (POE) for the GPTU as part of its application to form the unit; however, the POE was not approved by the ADNR DOG. The POE provided that if the proposed unit POE was disapproved, The ADNR could propose modifications that, if accepted by Donkel, would qualify the plan for approval. The division proposed modifications to the POE that involved Donkel drilling one exploration well in the western acreage by year five to delineate the resource in that area and drilling one exploration well in the eastern acreage by year five to delineate the resource in that area (Cashman 2025d).

Grey Owl Unit: The Grey Owl Unit, formed in 2023, is located south of the Badami Unit and near the Canning Formation. Operated by Savant LLC, a subsidiary of Glacier Oil & Gas Corp., the unit targets a reservoir containing light oil in the Canning turbidite sands. The West Kavik Unit No. 1 well, drilled by Texaco in 1969, provided evidence of light oil in the Canning Formation of the Grey Owl unit (Bailey 2019). In 2023, a 5-year plan was approved for drilling one exploratory well during winter 2026–2027 (Cashman 2023). As a result of expanding the unit in 2025, drilling and completion of a total of two exploratory wells will be required by September 2028 (Cashman 2025b).

Toolik River Unit: The Toolik River Unit is located in the southwest portion of the study area and bisects the Dalton Highway. Accumulate Energy Alaska Inc., a subsidiary of 88 Energy Limited (88 Energy), operates Project Phoenix, the oil-bearing conventional reservoir play program within the unit. The Hickory-1 discovery well was drilled in 2023. Flow testing in 2024 confirmed oil flow to the surface, exceeding expectations and significantly enhancing Project Phoenix's commercial potential (88 Energy 2025).

Alkaid Unit: The Alkaid Unit is along the western border of the study area and bisects the Dalton Highway, with primary operations occurring on the west side of the road. The unit is managed by Great Bear Pantheon, a subsidiary of Pantheon Resources, an independent O&G exploration company based in the United Kingdom. The Alkaid-1 well was drilled in 2015, flow tested and suspended in 2019. In 2022, Alkaid-2 was drilled and flow tested. The 2022 exploration plans

included the Alkaid-3 exploration well; however, it has yet to be drilled. The long-term test well Alkaid-2 is currently producing approximately 300 bbl/d of condensate and natural gas liquids and 180 bbl/d of high-quality oil (Orr 2023).

2.2 Exploration Wells and Operations

Lagniappe Alaska LLC Leases: Exploration at the Lagniappe leases started in 2013 by Armstrong Oil & Gas, Inc. and Repsol E&P USA LLC. The area is anticipated to hold resources like those at Pikka but with better reservoir porosity and permeability (Cashman 2024c). The program includes six locations: Killian 1 and 2 (notably not the same location as the planned Badami Killian development well), Montucky, King Street, Sockeye, and Voodoo (Schulte 2024). In 2023, developer Apache Corporation joined the Lagniappe team (Alaska Business 2025). Drilling started in 2024 at three of the locations: King Street, Sockeye, and Voodoo. Both the Voodoo 1 and Sockeye 1 wells were plugged and abandoned before reaching their target depth; however, Sockeye 2 and King Street 1 made successful discoveries (Alaska Business 2025; Schulte 2024):

- Sockeye 2 was drilled to approximately 10,500 feet, encountering a high-quality reservoir (Alaska Business 2025). 500 to 800 MMbo are estimated to be recoverable from the location (Cashman 2025c).
- King Street 1 was drilled to approximately 10,241 feet and encountered oil in two separate Brookian zones, at 8,130 feet and 9,850 feet (Alaska Business 2025; Cashman 2024c).

Yukon Gold: The Yukon Gold-1 discovery well was drilled by BP in 1993. Located on the Yukon Leases, it is currently operated by 88 Energy, a wholly owned subsidiary of Regenerate Alaska, Inc. Initially estimated by the state to contain 120 MMbo, a 2018 report suggested that recent seismic activity put the estimate closer to 90 MMbo (Cashman 2019).

Jacob's Ladder: The Jacob's Ladder prospect was initially identified by proprietary 3D seismic data from lease owners Anadarko Petroleum (Healy 2004). Two discovery wells were drilled in 2007 and 2008 with partners ASRC and BG Group; however, no commercial hydrocarbons were found (Lidji 2009). Prior exploration wells in the area included Kadler State 15-09-16, Lake 79 Federal No. 1, and Kad River No. 1. None of the aforementioned wells encountered economic petroleum reserves in either the Sadlerochit or Lisburne intervals. Heavy oil and dead oil shows, however, were quite common (ADNR 2005). The sits infrastructure includes a 5,400-foot-long airstrip and a gravel well pad, with a 3.6-mile-long road connecting the two.

Kavik 1, 2, and 3: The Kavik gas field was discovered and delineated by two of the three Kavik wells in 1969 (Kavik 1 and 3) by ARCO Alaska. It is estimated that the Kavik gas field could hold up to 165 billion cubic feet (Bcf) of gas (Mahendra et al. 2005).

Kemik: The Kemik Unit No. 1 gas discovery well was drilled in 1971. The well had three operators over its operational history: Forest Oil Corporation, SOHIO, and BP Exploration (Alaska) Inc. The well

was suspended in 1972 with additional plug and abandonment efforts in the 1990s (Alaska Oil and Gas Conservation Commission [AOGCC] 1995; E.A. Opstad & Associates 1995).

Mikkelsen: The Mikkelsen Bay State No. 1 well was drilled by Mobil Oil Corporation in 1970, and the well was plugged and abandoned the same year. Flow testing resulted in some O&G (Nelson et al. 1999). The Mikkelsen area is situated on the flanks and crest of a geological structure known as the Mikkelsen High. The Mikkelsen High and the associated Mikkelsen Bay area are part of the broader "Kemik–Thomson Play," an area identified by the U.S. Geological Survey (USGS) as having significant potential for undiscovered O&G resources (Schenk and Houseknecht 2008).

2.3 Off-Shore Exploration

The Inactive Liberty Unit: Offshore oil exploration in the western part of the study area in federal waters included four wells initially drilled by Royal Dutch Shell; three utilized the artificial Tern Island, which was built in the early 1980s, and one was drilled from the nearby Goose Island. BP acquired the leases in 1996 and drilled the Liberty No. 1 exploration well in 1997. BP ultimately planned to develop resources at Liberty through ultra-extended-reach drilling of up to six development wells from the shore (BOEM 2025; Rosen 2023). Liberty was sold to Hilcorp in 2014. The prospect is estimated to contain 150 MMbo of recoverable oil, one of the largest potential sources of light oil production on the North Slope (Rosen 2023).

The Inactive Taktuk Unit: Offshore oil exploration in the northeastern part of the study area in federal waters included two initial exploration wells, Hammerhead No. 1 and Hammerhead No. 2, which were drilled by Union Oil Company in 1985 and 1986, respectively (Rosen 2018).

The Hammerhead prospect was later renamed the Sivulliq prospect, and an additional exploratory well, Sivulliq N, was started by Shell in 2012 but was never completed. ASRC Exploration LLC acquired the leases from Shell in 2016. The area was unitized in 2017 as the Taktuk Unit, and the leases were suspended later that same year (Rosen 2018).

Stinson: The offshore oil exploration well Stinson No. 1 is located east of the study area, north of the ANWR 1002 Area, in state waters. The well was initially drilled by ARCO in 1990 and made an O&G discovery; however, the location was too remote at the time for production. Core samples made public in 2008 and additional two-dimensional (2D) seismic data suggest the area could be highly lucrative (Saucier 2018).

Kuvlum: The Kuvlum offshore oil prospect in the eastern part of the study area in federal waters was initially discovered by three exploratory wells drilled by ARCO Alaska in the early 1990s. Though the prospect was initially presumed to contain a considerable amount of oil in 1993, it was later considered too small for further development, leading to ARCO relinquishing its leases in 1999 (Rosen 2015).

2.4 ANWR Coastal Plain (Section 1002 Area)

Estimates of technically recoverable oil in undiscovered accumulations in the 1002 Area of the Coastal Plain range from 4.25 billion barrels of oil (BBO) to 11.80 BBO, with a mean of 7.69 BBO, which is the equivalent of about one-third to one-half of the greater Prudhoe Bay field (USGS 2005).

The only well drilled onshore in the 1002 Area of ANWR is KIC Jago River-1, drilled by Chevron in 1985–1986, east of Kaktovik. The results of the KIC well have been kept confidential.

2.5 Oil and Gas Reserves

Using a geology-based assessment methodology, the USGS estimates undiscovered, technically recoverable mean resources of 3.6 BBO and 8.9 trillion cubic feet (Tcf) of natural gas in conventional accumulations in the central North Slope of Alaska between NPR-A and ANWR (Houseknecht et al. 2020). The area hosts most of the producing O&G fields in Arctic Alaska, from which more than 18 BBO have been produced. Despite this, the area remains lightly explored outside areas of existing production (Houseknecht et al. 2020).

Table 2-1 summarizes published estimates of O&G reserves for known accumulations within and near the project area. An all-season road is expected to reduce the cost of exploration and development for these prospects and lead to greater economic activity for the state.

Table 2-1 Inventory of Estimated Oil and Gas Reserves

Pool	Oil 1 (MMbo)	Gas (Bcf)	Location	Reference
Alkaid	2,800[2]/43,300[3]	27.3[2]/423.5[3]	Dalton Highway; Franklin Bluffs	Pantheon 2025
Badami	120[2]	NA	Mikkelsen Bay; East Badami Creek	Bredar and Whitney 2025
Grey Owl	Undetermined	NA	Central North Slope	Cashman 2023
Taktuk	100-200[3]		Offshore Beaufort Sea	Nelson 2005
Kavik	NA	115[2]/165[3]	Kavik River; Brooks Range foothills	Mahendra et al. 2005
Kemik	NA	Undetermined	Brooks Range Foothills	Schenk and Houseknecht 2008
Kuvlum	1,000[3]	NA	Offshore from ANWR, Beaufort Sea	Rosen 2015
Liberty	150[2]	NA	Liberty Island, Foggy Island Bay	Rosen 2015
Mikkelsen	Undetermined	NA	Onshore near Foggy Island Bay (east)	Schenk and Houseknecht 2008
Point Thomson	200[3]	8,000[3]	Point Thomson; ANWR adjacent	Anderson 2022

Pool	Oil 1 (MMbo)	Gas (Bcf)	Location	Reference
Sockeye	650[3]	NA	Lower East Badami Creek	APA Corporation 2025
Sourdough	100-300[2]	NA	Staines River; ANWR adjacent	Corbisier 2002
Stinson	3,400 to 10,200[2]	NA	Offshore of ANWR	Saucier 2018
Talitha	2,200[2]/17,000[3]	NA	Dalton Highway; Franklin Bluffs	Knight 2022
Toolik River	647[3]	NA	Dalton Highway; Franklin Bluffs (south)	88 Energy 2022
Yukon Gold	90[3]	NA	Staines River; ANWR adjacent	Cullinane 2018

Notes:
[1] Oil includes natural gas liquids.
[2] Estimated recoverable reserves.
[3] Estimated in-place reserves.
Key: ANWR = Arctic National Wildlife Refuge; Bcf = billion cubic feet of gas; MMbo = million barrels of oil; NA = not available

2.6 Future Exploration and Development Outlook

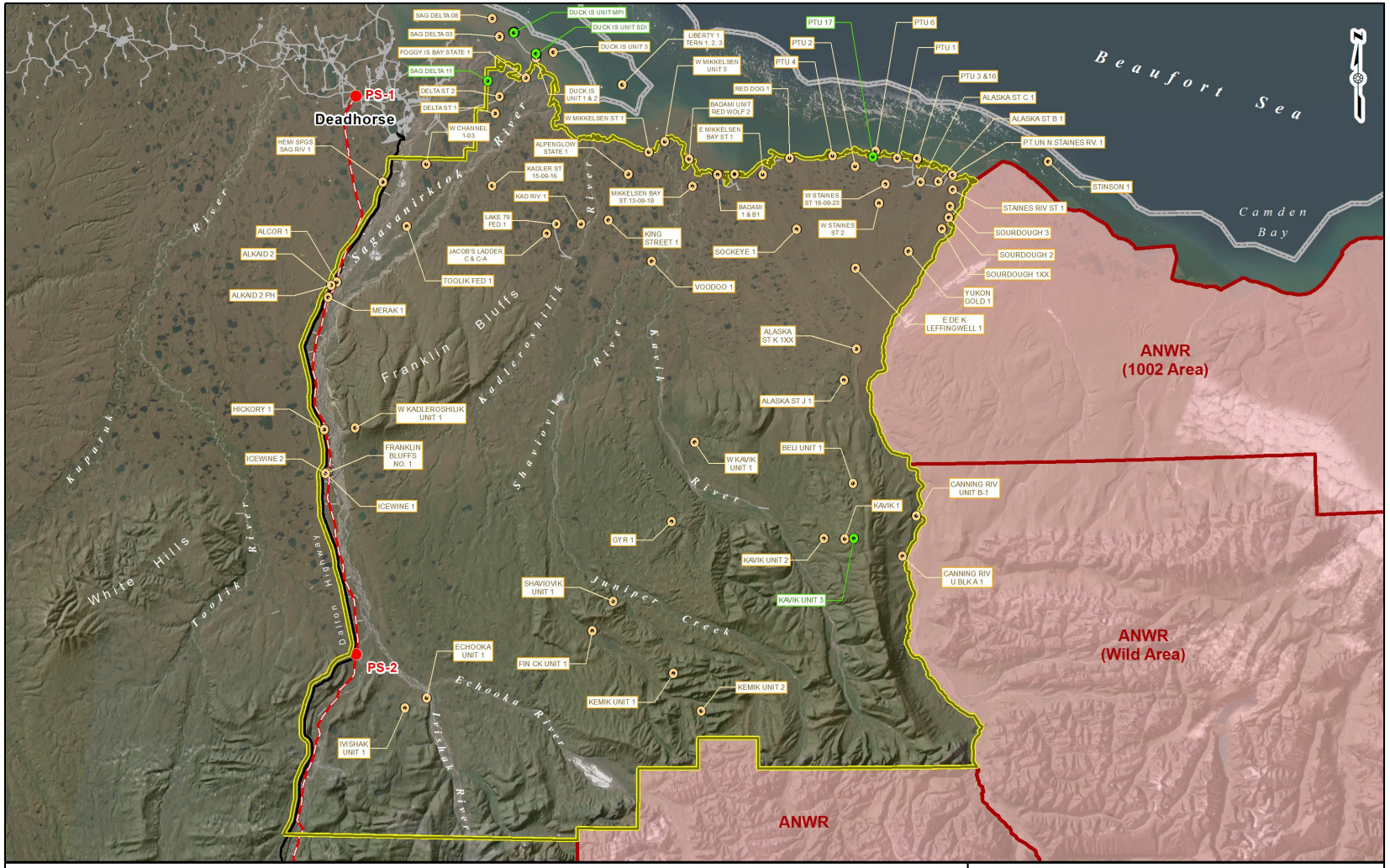
As discussed above, past and present exploration in the study area has shown substantial O&G potential. Upcoming drilling in the area includes the Badami Unit's new development well in the Killian Formation (not to be confused with the Killian No. 1 and No. 2 wells proposed by Lagniappe). Hilcorp's plans call for drilling and completing PTU-19 during the winter of 2025–2026; followed by facility expansion; additional drilling; and construction of new roads, pads, and wells at Point Thomson in 2027 and beyond. Hilcorp also has plans to develop Liberty, most likely from an artificial island (Suagier 2025). Planned exploration and development also includes construction of a new infrastructure pad and two exploratory wells in the Grey Owl Unit and two exploratory wells in the eastern and western acreage of the GPTU.

The estimated yield of the recently discovered Sockeye-2 well on the Lagniappe leases has renewed O&G interest in the area and again highlighted the area's development potential. Although detailed future exploration plans by Lagniappe or Apache have not been disclosed, it is likely that delineation wells will be drilled in the foreseeable future. The state's recent annual O&G lease sale in November 2025 saw a high level of bidding, with the most tracts sold in a North Slope lease sale since the annual areawide leasing program started in 1999 (ADN 2025). These new lease holdings are called out separately in Figure 2-3.

The O&G potential of the neighboring Section 1002 Area of ANWR has also seen renewed interest, with a planned multi-year seismic program on leases held by AIDEA currently scheduled for winter 2026–2027. AIDEA's lease blocks are shown on Figure 2-3. The ANWR Coastal Plain is the most prospective unexplored onshore area in North America with reserves estimates ranging from 5.7 to

nearly 16 billion barrels of technically recoverable oil. Apache Corporation and its partners Lagniappe Alaska LLC and Oil Search Alaska LLC have confirmed a discovery in a Paleocene-aged Topset play approximately 15 miles west of the 1002 Area (Sockeye), and the regional geology indicates that the Topset play extends into the 1002 Area. The USGS estimated in 1998 that the Topset play in the 1002 Area has a mean value of 15.45 BBO of oil-in-place and 6.18 BBO in technically recoverable oil. In addition, the USGS has estimated that the Turbidite play in the 1002 Area has another 5.33 BBO of oil-in-place and 1.6 BBO in recoverable reserves. There is also a high probability that the Thomson Sandstone, the primary reservoir of the Point Thomson field and a localized equivalent to the Kemik Sandstone, extends eastward across the boundary of the 1002 Area. The Topset, Turbidite, and Thomson-Kemik plays have the highest potential in prospectivity for oil and gas in the 1002 Area due to their location within the undeformed area, their proximity to established infrastructure to the west on state land, and discoveries made as close as half a mile to the 1002 Area's western boundary (ACES 2025).

Point Thomson is one of the primary gas fields on the North Slope and will likely play a key role in the Alaska Liquefied Natural Gas (LNG) Project currently being evaluated by Glenfarne Group, LLC and the Alaska Gasline Development Corporation (AGDC). The field's critical role has already been anticipated with the Point Thomson Transmission Line, a proposed pipeline segment under the Alaska LNG project to facilitate the movement of gas from Point Thomson to the proposed Gas Treatment Plant on the LNG mainline. The conditional right-of-way (ROW) on state lands, issued under Alaska Statute (AS) 38.35, was granted for the pipeline in April 2021 (ADNR DOG 2025b).


Deadhorse
PS-1
PS-2
Beaufort Sea
Camden Bay
Sagavanirktok River
Franklin Bluffs
Kadleroshilik River
Shaviovik River
Kuparuk River
White Hills
Toolik River
Dalton Highway
Juniper Creek
Echooka River
Itkillik River
ANWR
(1002 Area)
ANWR
(Wild Area)
ANWR
SAG DELTA 08
SAG DELTA 03
FOGGY IS BAY STATE 1
SAG DELTA 11
DELTA ST 2
DELTA ST 1
W CHANNEL 1-03
HEMI SPGS SAG RIV 1
DUCK IS UNIT MPI
DUCK IS UNIT SDI
DUCK IS UNIT 3
DUCK IS UNIT 1 & 2
LIBERTY 1, TERN 1, 2, 3
W MIKKELSEN UNIT 3
W MIKKELSEN ST 1
E MIKKELSEN BAY ST 1
BADAMI UNIT RED WOLF 2
RED DOG 1
PTU 17
PTU 6
PTU 2
PTU 1
PTU 4
PTU 3 &16
ALASKA ST C 1
ALASKA ST B 1
PT.UN.N.STAINES.RV 1
STINSON 1
STAINES RIV ST 1
SOURDOUGH 3
SOURDOUGH 2
SOURDOUGH 1XX
YUKON GOLD 1
E DE K LEFFINGWELL 1
ALASKA ST K 1XX
ALASKA ST J 1
BELI UNIT 1
W KAVIK UNIT 1
CANNING RIV UNIT B-1
KAVIK 1
KAVIK UNIT 2
KAVIK UNIT 3
CANNING RIV U BLK A 1
GYR 1
SHAVIOVIK UNIT 1
FIN CK UNIT 1
KEMIK UNIT 1
KEMIK UNIT 2
ECHOOKA UNIT 1
MISHAK UNIT 1
ALPENGLOW STATE 1
KADLER ST 15-09-16
KAD RIV 1
LAKE 79 FED 1
JACOB'S LADDER C & C-A
TOOLIK FED 1
MERAK 1
ALKAID 2
ALKAID 2 PH
ALCOR 1
MIKKELSEN BAY ST 13-09-19
KING STREET 1
VOODOO 1
SOCKEYE 1
BADAMI 1 & B1
W STAINES ST 15-09-23
W STAINES ST 2
HICKORY 1
W KADLEROSHILIK UNIT 1
FRANKLIN BLUFFS NO. 1
ICEWINE 2
ICEWINE 1
Study Area
Oil & Gas Unit Boundary
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
Development Well
Exploratory Well
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
EXPLORATION WELLS IN THE STUDY AREA
Eastern Access Road Study
SCALE:
0 5 10 15 20 Miles
FIGURE:
2-1
Coordinate System: NAD 1983 UTM Zone 6N
AES-RTS: 25-148-SEC-02-001, 1/28/2026

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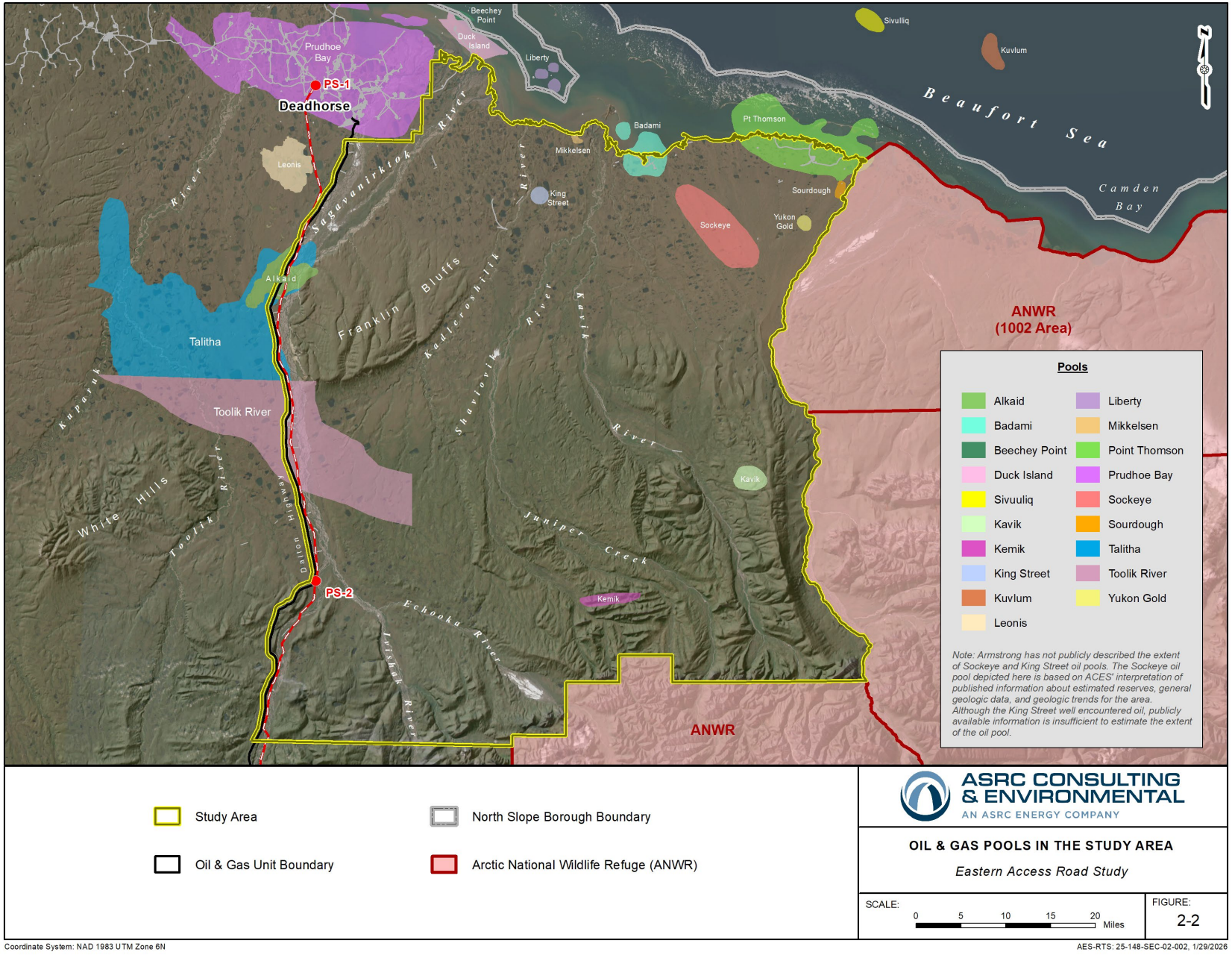
Beechey Point
Duck Island
Liberty
Sivulliq
Kuvlum
Prudhoe Bay
PS-1
Deadhorse
Badami
Pt Thomson
Beaufort Sea
Camden Bay
Mikkelsen
Sourdough
King Street
Sockeye
Yukon Gold
Leonis
Alkaid
Talitha
Toolik River
Franklin Bluffs
Kadleroshilik River
Shaviovik River
Kavik River
Kuparuk River
Sagavanirktok River
Toolik River
White Hills
Dalton Highway
Juniper Creek
Kemik
PS-2
Echooka River
Itkillik River
ANWR
(1002 Area)
ANWR
Pools
Alkaid
Badami
Beechey Point
Duck Island
Sivuuliq
Kavik
Kemik
King Street
Kuvlum
Leonis
Liberty
Mikkelsen
Point Thomson
Prudhoe Bay
Sockeye
Sourdough
Talitha
Toolik River
Yukon Gold
Note: Armstrong has not publicly described the extent of Sockeye and King Street oil pools. The Sockeye oil pool depicted here is based on ACES' interpretation of published information about estimated reserves, general geologic data, and geologic trends for the area. Although the King Street well encountered oil, publicly available information is insufficient to estimate the extent of the oil pool.
Study Area
North Slope Borough Boundary
Oil & Gas Unit Boundary
Arctic National Wildlife Refuge (ANWR)
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
OIL & GAS POOLS IN THE STUDY AREA
Eastern Access Road Study
SCALE:
0 5 10 15 20 Miles
FIGURE:
2-2
Coordinate System: NAD 1983 UTM Zone 6N
AES-RTS: 25-148-SEC-02-002, 1/29/2026

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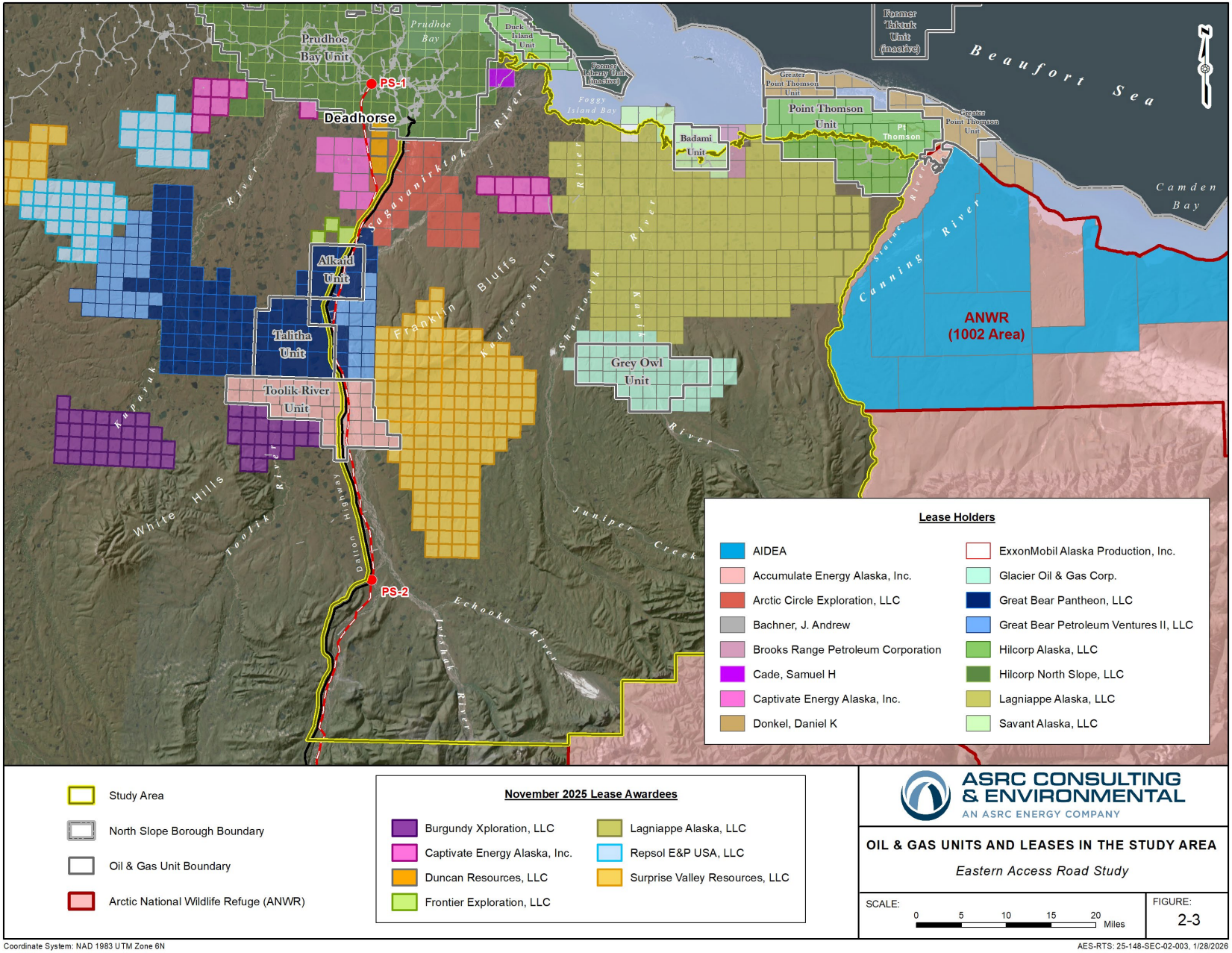
Prudhoe Bay Unit
Prudhoe Bay
Duck Island Unit
Former Tikiuk Unit (inactive)
Former Liberty Unit (inactive)
Foggy Island Bay
Beaufort Sea
Greater Point Thomson Unit
Point Thomson Unit
Pt Thomson
Badami Unit
Camden Bay
PS-1
Deadhorse
Sagavanirktok River
Alkaid Unit
Talitha Unit
Toolik River Unit
Franklin Bluffs
Kuparuk River
Shaviovik River
Canning River
ANWR (1002 Area)
Grey Owl Unit
White Hills
Toolik River
Dalton Highway
Juniper Creek
PS-2
Echooka River
Ivishak River
Lease Holders
AIDEA
Accumulate Energy Alaska, Inc.
Arctic Circle Exploration, LLC
Bachner, J. Andrew
Brooks Range Petroleum Corporation
Cade, Samuel H
Captivate Energy Alaska, Inc.
Donkel, Daniel K
ExxonMobil Alaska Production, Inc.
Glacier Oil & Gas Corp.
Great Bear Pantheon, LLC
Great Bear Petroleum Ventures II, LLC
Hilcorp Alaska, LLC
Hilcorp North Slope, LLC
Lagniappe Alaska, LLC
Savant Alaska, LLC
Study Area
North Slope Borough Boundary
Oil & Gas Unit Boundary
Arctic National Wildlife Refuge (ANWR)
November 2025 Lease Awardees
Burgundy Xploration, LLC
Captivate Energy Alaska, Inc.
Duncan Resources, LLC
Frontier Exploration, LLC
Lagniappe Alaska, LLC
Repsol E&P USA, LLC
Surprise Valley Resources, LLC
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
OIL & GAS UNITS AND LEASES IN THE STUDY AREA
Eastern Access Road Study
SCALE:
0 5 10 15 20 Miles
FIGURE:
2-3
Coordinate System: NAD 1983 UTM Zone 6N
AES-RTS: 25-148-SEC-02-003, 1/28/2026

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3.0 BENEFITS OF THE PROPOSED ROAD

Table 3-1 identifies specific benefits the proposed road provides for O&G companies, the State of Alaska, AIDEA, and local residents, particularly the residents of Kaktovik. The list of benefits is not comprehensive but provides representative examples to highlight key benefits of an all-season road connection. If financed through AIDEA, road construction supports AIDEA's mandate to expand the State's economy and provide jobs for Alaska.

Table 3-1 Benefits of the Proposed Road

Benefit	Representative Examples of Specific Benefits of an All-Season Road
Improves Year-Round Access to O&G Infrastructure	• Improves access to existing isolated developments (Badami and Point Thomson), lowering the cost of transporting basic goods, fuel, equipment, and services to these facilities for ongoing operations and further development. Reduces or eliminates reliance on annual snow trail and ice road construction. • Improves access to existing and proposed pipelines for operations and maintenance, including the Badami Pipeline (oil), the Point Thomson Pipeline (NGLs), and the proposed Alaska LNG gas pipeline (natural gas) • Reduces seasonal bottlenecks and mobilization uncertainty • Improves inspection frequency and response time for linear infrastructure (e.g., roads, utilities, fiber optics) • Improves logistics reliability and scheduling certainty for operations, maintenance, and regulatory compliance activities
Stimulates Exploration and Development	• Stimulates additional exploration and development by improving access to currently undeveloped onshore resources, including Mikkelsen, King Street, Sockeye, Sourdough, Yukon Gold, and ANWR 1002 Area • Stimulates additional exploration and development by improving access to currently undeveloped offshore resources, including Liberty, Greater Point Thomson, Taktuk/Sivulliq, and Kuvlum
Increases State of Alaska Revenue, Economic Development, and Energy Security	• Supports the Alaska Constitution by encouraging resource development for maximum public interest • Stimulates O&G development, thereby increasing O&G revenues that fund a substantial portion of Alaska's state budget, supporting essential services like education, public safety, and infrastructure • A portion of O&G revenues goes into the Alaska Permanent Fund (APF), providing annual dividend payments to eligible residents, boosting household income • By encouraging O&G development, supports hundreds of well-paid jobs, stimulates related industries, and offers lower energy costs for residents and businesses • Oil and gas revenues are a cornerstone of Alaska's energy-intensive economy. Stimulating additional production contributes significantly to overall gross domestic product (GDP) and economic stability • By encouraging O&G development, the road supports domestic energy security and vital infrastructure like the Trans-Alaska Pipeline System (TAPS) by providing additional throughput

Benefit	Representative Examples of Specific Benefits of an All-Season Road
	• Supports long-term fiscal planning by enabling incremental development rather than episodic, winter-only investment cycles
Supports cultural connectivity	• Improves overland travel between Kaktovik and Nuiqsut, strengthening inter-community connections and facilitating participation in cultural activities, gatherings, and seasonal events (e.g., Iñupiaq language workshops, whaling seasons, Kivgiq Festival, Nalukataq) • Improves access to Kaktovik by reducing the annual cost of the CWAT trail construction from 138 miles long to approximately 74 miles long (46% reduction). • Allows residents of Nuiqsut and Kaktovik to exchange Indigenous knowledge (elders/youth; subsistence practices)
Lowers costs of goods and services for Kaktovik	• Lowers the cost of transporting fuel, building materials, equipment, and other goods and services to Kaktovik • Facilitates trucking of gravel to Kaktovik (where gravel is scarce) for expansion or improvements to the airport and community roads • Lowers the capital cost of infrastructure development (e.g., construction of homes, schools, public buildings, commercial buildings, utilities) • Improves accessibility to the statewide road system, providing a greater range of consumer, leisure, entertainment. and recreational opportunities (e.g., box stores, restaurants, hotels, grocery stores)
Preserves or enhances subsistence traditions	• Allows access to a wider range of subsistence areas for fishing, hunting, and gathering for residents of Nuiqsut and Kaktovik • Allows greater access and options to enhance the subsistence economy (e.g., bartering)
Improves health and safety conditions	• Allows greater access for spill response resources and equipment • Provides evacuation route for workers at Badami, Point Thomson, and other future developments • Allows connectivity between airports at Badami and Point Thomson, providing options for emergency Medevac if inclement weather closes one airport • Enhances redundancy in emergency response routes during extreme weather events or aviation disruptions
Improves Transportation System Resilience	• Provides redundancy to air-only access for industrial facilities • Improves reliability during extreme weather, prolonged low-visibility events, or aviation disruption • Enhances climate adaptation by reducing reliance on shortening ice road seasons • Reduces repeated seasonal disturbance associated with annual ice road and snow trail construction • Consolidates surface access into a single managed corridor rather than dispersed seasonal routes
Enhances workforce development	• Provides direct jobs for road construction and maintenance • By encouraging O&G development, supports exploration and production jobs • Could provide the catalyst for new business opportunities • Supports local hire and on-the-job training opportunities during construction and maintenance

Benefit	Representative Examples of Specific Benefits of an All-Season Road
	• Improves access for regional residents to employment centers (e.g., Harry K. Brower Jr. Training Center [HBTC] in Deadhorse)
Enhances Interagency Coordination and Public Services	• Improves access for state, borough, and federal agencies responsible for inspection, monitoring, and emergency response • Supports coordinated delivery of public services (health, safety, environmental monitoring)

Key: ADF&G = Alaska Department of Fish and Game; ADNR = Alaska Department of Natural Resources; ANWR = Arctic National Wildlife Refuge; CWAT = Community Winter Access Trail; GDP = gross domestic product; LNG = liquefied natural gas; NGLs = natural gas liquids; O&G = oil and gas; TAPS = Trans-Alaska Pipeline System

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4.0 PREVIOUSLY CONSIDERED ROUTES

Several transportation corridors and roadway alignments have been proposed in previous studies and planning documents to access oil and gas resources on the eastern North Slope. This section summarizes these routes and provides context for the alternatives evaluated in this study.

4.1 Previously Identified Transportation Corridors and Road Routes

Before developing route alternatives for this study, ACES reviewed proposed routes identified in previous studies or publications. These routes include:

- North Coast Access Corridor (State of Alaska)
- Northern Foothills Corridor (State of Alaska)
- NSB Transportation Corridor
- Route alternatives presented in the *Phase II Bullen Point Roadway Reconnaissance Engineering Report* (CH2M Hill 2005), including:
    - Coastal Corridors C-1, C-2, and C-3
    - Lease Corridor
    - Foothills Corridor

Several of these routes were documented in previous transportation planning studies, including the Phase II Bullen Point Roadway Reconnaissance Engineering Report prepared by CH2M Hill in 2005. Each of these routes is briefly described in the following sections and connects existing transportation infrastructure to the vicinity of O&G discoveries on the eastern North Slope as shown in Figure 4-1.

Significant changes have occurred since many of these routes were originally proposed. Because several of the previously identified corridors were developed more than two decades ago, it is important to consider how conditions in the study area have changed. New O&G discoveries, new infrastructure, and other regulatory and planning changes have taken place in recent years. For example, major developments since CH2M Hill's 2005 report include the following:

- The Point Thomson field was developed and began production in 2016. At the time of the 2005 report, the Point Thomson field had been discovered and delineated, but was not yet developed.
- The Bullen Point Short Range Radar station was closed in 2007, the site was decommissioned and remediated, and the land was conveyed from the U.S. Air Force to the State of Alaska after remediation was deemed complete in 2008.
- The North Slope Area Plan was issued in 2021.

- Several new units were formed, including Greater Point Thomson, Grey Owl, Toolik River, Talitha, and Alkaid.
- New oil discoveries have occurred at the King Street and Sockeye exploration sites.
- New lease sales have occurred within the project area, indicating expanded interest.

Despite these changes, it is worthwhile to consider these previous alignments because segments of these routes or river crossing locations may still be valid for incorporation into new or modified routes.

4.1.1 North Coast Access Corridor

A grid of transportation corridors was identified in the 1990s by the State of Alaska during the state land selection process; however, the corridor maps used for planning were never formally released. In 2001, ADNR's Division of Geological & Geophysical Surveys (DGGS) instituted a project to formally release the map products and data compiled during the previous study to provide public access to geologic, geologic-materials, and engineering-geologic information that can affect decisions about transportation options for mineral development and other diverse enterprises (Reger et al. 2003). Portions of two transportation corridors fall within the project area of this report: the North Coast Access Corridor and the Northern Foothills Corridor.

The proposed North Coast Access Corridor extends from Utqiaġvik to Kaktovik, although for this study only the portion of the corridor east of the Dalton Highway was reviewed (Figure 4-1). Within the study area, the North Coast Access Corridor originates near the Dalton Highway MP 391 just north of Franklin Bluffs, crosses a buried segment of TAPS and the Sagavanirktok River, then traverses eastward through the Coastal Plain crossing the Kadleroshilik, Shaviovik, and Kavik rivers before reaching the border of ANWR and the Canning River. From there it continues outside this study's project area and eastward across the ANWR 1002 Area until it turns to the northeast to reach Kaktovik. The route from Dalton Highway to Kaktovik is approximately 275 miles long, with the first 61.7 miles falling within the project boundaries.

4.1.2 Northern Foothills Corridor

The Northern Foothills Corridor traverses the northern Brooks Range foothills from the De Long Mountains east of Point Hope to the Philip Smith Mountains southwest of Kaktovik, where it turns northward until connecting with the North Coast Access Corridor (Figure 4-1). The Northern Foothills Corridor intersects the Dalton Highway near MP 344, traverses a buried segment of TAPS and the Sagavanirktok River, then crosses the Ivashak and Echooka rivers, the headwaters of the Kadleroshilik River, Shaviovik River, and Kemik Creek before turning northerly and crossing Fin Creek, Juniper Creek, and the Kavik River. The route from the Dalton Highway to the intersection with the North Coast Access Corridor is 82.7 miles long.

4.1.3 NSB Transportation Corridor to Point Thomson

Chapter 15 of the *NSB Areawide Comprehensive Plan 2019–2039* (NSB 2019a) shows a transportation corridor extending from the Dalton Highway to the border of ANWR near Point Thomson (Figure 4-1). The route originates near Dalton Highway Milepost 339 south of Sagwon, crosses the Sagavanirktok River and a buried segment of TAPS, then traverses northeast across the foothills crossing the Ivashak, Echooka, Kadleroshilik, and Shaviovik rivers, then crosses Fin Creek and Juniper Creek, before turning northerly and crossing the Kavik River and paralleling the ANWR border until reaching the vicinity of Point Thomson. The route is approximately 103.6 miles long and passes through ASRC surface lands near the Echooka and Shaviovik rivers.

4.1.4 Phase II Bullen Point Roadway Route Alternatives

4.1.4.1 Coastal Corridor C-1

Coastal Corridor C-1 was identified by CH2M Hill in the 2005 *Phase II – Bullen Point Roadway Reconnaissance Engineering Report* (Figure 4-1). The corridor generally aligns the roadway on the north side of the Badami and Point Thomson pipelines. The route originates at Endicott Road, crossing the Endicott aboveground pipeline, traversing easterly across the Sagavanirktok River east channel on an alignment roughly parallel to the pipelines. After crossing the Kadleroshilik and Shaviovik rivers, the route crosses the pipelines and runs south of Badami and the Point Thomson pipeline. Just south of Point Hopson, the alignment crosses over the Point Thomson pipeline to the north side until intersecting with Point Thomson's West Pad. The route is 45.6 miles long.

4.1.4.2 Coastal Corridor C-2

Coastal Corridor C-2 aligns the roadway on the south side of the Badami and Point Thomson pipelines (Figure 4-1). Like Corridor C-1, the route originates at Endicott Road (although farther to the southwest), crosses the Endicott pipeline, and the Sagavanirktok, Kadleroshilik, and Shaviovik rivers. The route continues eastward across the Coastal Plain until intersecting the Point Thomson road system north of the airstrip and gravel mine site. Coastal Corridor C-2 included a spur road to the Bullen Point radar site (Bullen Point Connector); however, that site has now been decommissioned. The route is 47.1 miles long.

4.1.4.3 Coastal Corridor C-3

Coastal Corridor C-3 is the recommended route in CH2M Hill's 2005 report (Figure 4-1). The first segment follows the same alignment as Coastal Corridor C-2. After the Kadleroshilik River crossing, the route turns southeasterly until crossing the Shaviovik River, then continues easterly to the West Staines State 2 gravel pad. The route is 46.5 miles long.

4.1.4.4 Lease Corridor

The Lease Corridor shares the same point of origin and terminus as Coastal Corridor C-2, except that it loops south approximately 10 miles to access the Jacob's Ladder road segment and airstrip and additional lease areas (Figure 4-1). The route requires crossings of the same rivers as those crossed by the three coastal corridor routes. Including the common segments with C-2, the Lease Corridor is approximately 79.4 miles long.

4.1.4.5 Foothills Corridor

The Foothills Corridor has three potential points of origin and several different interconnected route alignments (Figure 4-1). The route begins along the Dalton Highway near Mileposts 374, 370, or 368 and extends east to the Kavik and Kemik gas deposits, crossing TAPS, the Sagavanirktok, Kadleroshilik, and the Shaviovik rivers. Depending on which alignment is selected, the route is about 53 miles long to Kavik, with a spur to Kemik that is about 7.5 to 26.4 miles long (depending on the route).

4.2 Winter Routes

In addition to previously proposed gravel road corridors, several winter snow trail and ice road routes have been established in the study area, as shown in Figure 4-2. The most prominent of these routes are:

- The Badami Ice Road
- The Kaktovik Community Winter Access Trail (CWAT)
- The Point Thomson Unit Resupply Route

These seasonal routes confirm the need for overland access to O&G facilities and community infrastructure and help identify commonly used travel corridors across the region.

It is important to note that river crossing locations for winter routes are often not ideal for permanent crossings with a gravel road and bridges. Winter routes generally favor crossings with minimal vertical relief (for tundra vehicle passage), whereas permanent bridge crossings are generally sited on relatively narrow, straight channels with stable banks.

4.2.1 Badami Ice Road

The 27-mile-long Badami ice road originates at Endicott Road traversing southeasterly until crossing the Sagavanirktok River, then continuing eastward across the Arctic Coastal Plain crossing the Kadleroshilik and Shaviovik rivers until intersecting gravel infrastructure at Badami (Figure 4-2). The seasonal ice road is constructed periodically as the need arises for drilling or resupply, with the most recent construction in winter 2023–2024 in support of the Killian exploration well.

4.2.2 Kaktovik Community Winter Access Trail

Kaktovik Iñupiat Corporation (KIC) has requested a 20-year special use permit for a winter ROW for a CWAT across ANWR lands and waters (Federal Register 2023). The purpose of the CWAT is for overland movement of school and other building modules for Kaktovik, bi-directional movement of community vehicles, transport of diesel fuel for the community power plant, and movement of other consumables needed by the community. Low ground pressure vehicles will be used for transport across the trail (KIC 2021).

As shown in Figure 4-2, the CWAT route originates in Deadhorse, traversing southward to crossings at the west and main channels of the Sagavanirktok River, then striking eastward across the Arctic Coastal Plain, crossing the Kadleroshilik and Shaviovik rivers until turning northward to intersect the Main Pad at Point Thomson. From there, the route extends eastward and southeastward outside the study area, crossing the Canning River and routing across the Arctic Coastal Plain before ultimately connecting to Kaktovik on Barter Island. The route from Deadhorse to Kaktovik is approximately 138 miles long, with 62.7 miles between Deadhorse and Point Thomson's Main Pad.

4.2.3 Point Thomson Unit Resupply Route

As shown in Figure 4-2, the Point Thomson Unit (PTU) Resupply route originates in Deadhorse, traversing east to cross the west channel of the Sagavanirktok River. In the channel floodplain, the route takes a southeast trajectory, crossing the main channel of the Sagavanirktok River, then strikes eastward across the Arctic Coastal Plain crossing the Kadleroshilik and Shaviovik rivers until turning northward to intersect the Main Pad at Point Thomson. The Point Thomson Resupply and Kaktovik CWAT routes have very similar routes between Deadhorse and Point Thomson Main Pad, approximately 58.9 miles.

The previously identified gravel road corridors and existing winter travel routes provide useful context for evaluating potential access routes across the eastern North Slope. Although none of these previously proposed alignments directly correspond to the alternatives evaluated in this study, they highlight commonly used travel corridors, key river crossing locations, and logistical considerations relevant to future transportation development in the region. These historical and seasonal routes were considered during the development of the route alternatives evaluated in the following sections.

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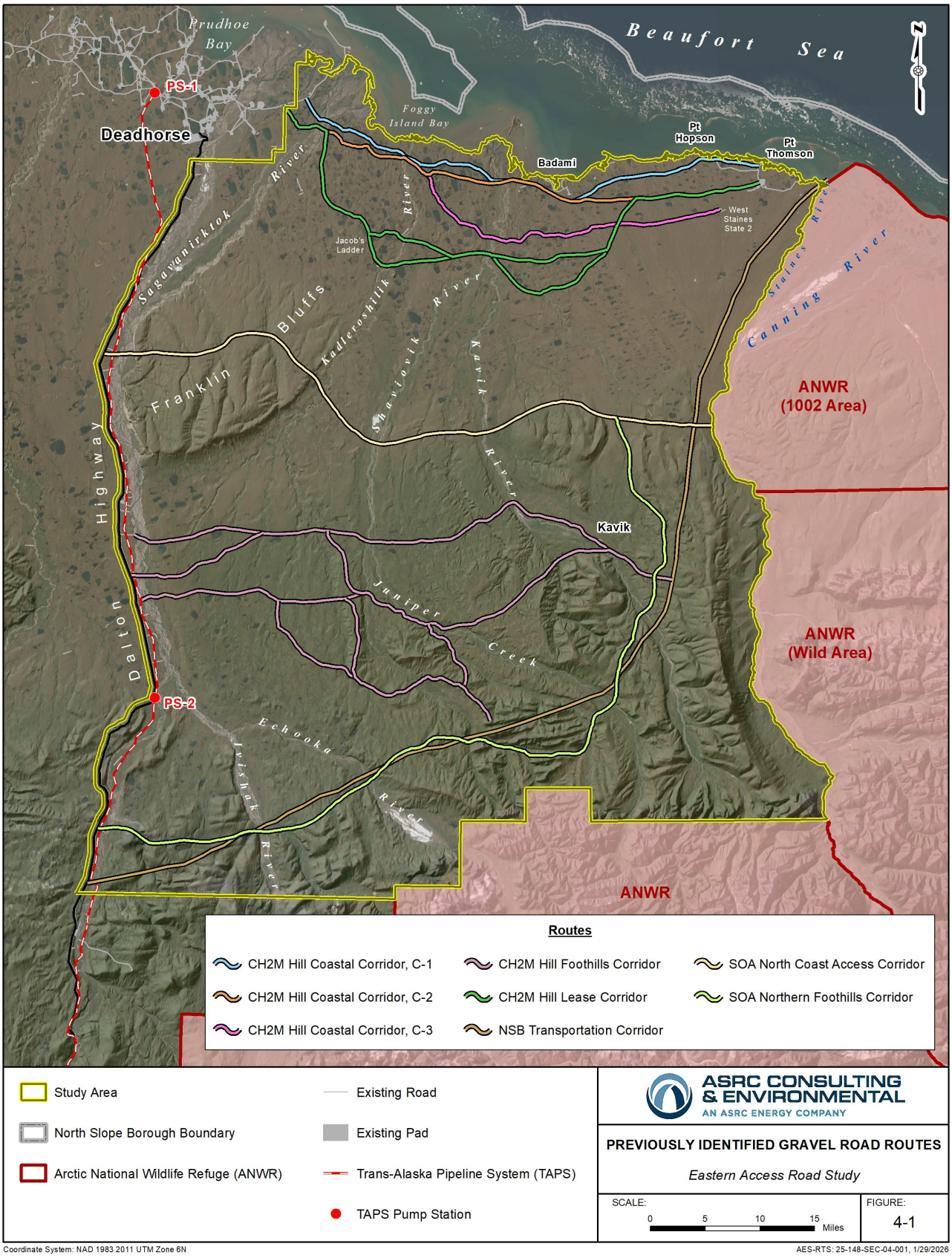
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Staines River
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Bluffs
Franklin
Dalton Highway
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ANWR (Wild Area)
ANWR
Kavik
Juniper Creek
Echooka River
Ivishak River
PS-2
Routes
CH2M Hill Coastal Corridor, C-1
CH2M Hill Coastal Corridor, C-2
CH2M Hill Coastal Corridor, C-3
CH2M Hill Foothills Corridor
CH2M Hill Lease Corridor
NSB Transportation Corridor
SOA North Coast Access Corridor
SOA Northern Foothills Corridor
Study Area
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
Existing Road
Existing Pad
Trans-Alaska Pipeline System (TAPS)
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
PREVIOUSLY IDENTIFIED GRAVEL ROAD ROUTES
Eastern Access Road Study
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Coordinate System: NAD 1983 2011 UTM Zone 6N
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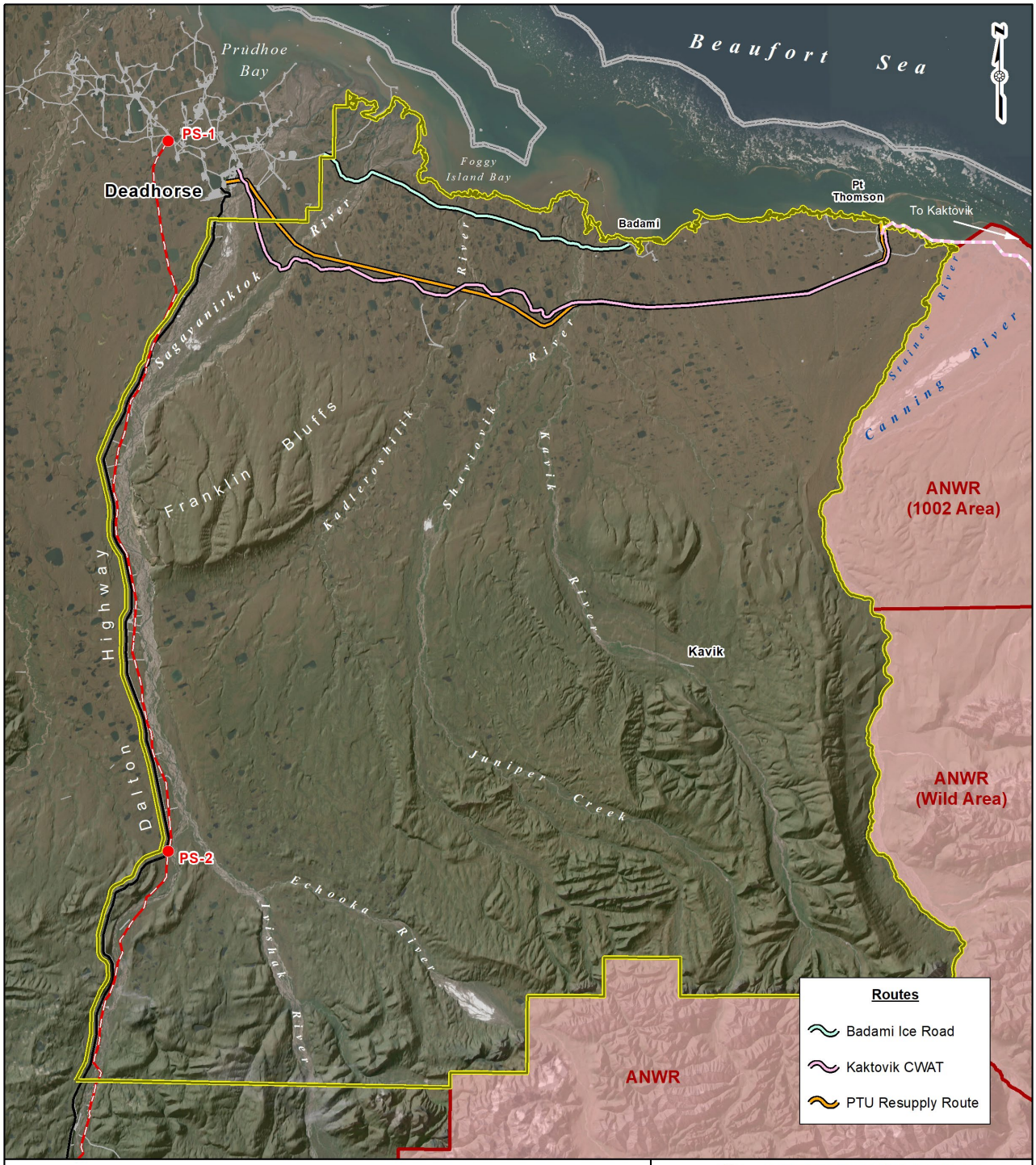
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ANWR (Wild Area)
PS-2
Echooka River
Ivishak River
ANWR
Routes
Badami Ice Road
Kaktovik CWAT
PTU Resupply Route
Study Area
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
Existing Road
Existing Pad
Trans-Alaska Pipeline System (TAPS)
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
ICE AND SNOW TRAILS
Eastern Access Road Study
SCALE:
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FIGURE:
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Coordinate System: NAD 1983 2011 UTM Zone 6N
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5.0 ROADWAY ASSUMPTIONS AND CONSIDERATIONS

This section describes the primary engineering assumptions and planning considerations for the proposed roadway and outlines relevant guidelines from the North Slope Area Plan (NSAP) (ADNR 2021).

5.1 Road Geometry and Design Assumptions

- The assumed road prism will consist of a double-lane gravel embankment, generally 5 to 6 feet thick, with a top width of approximately 30 feet and a side slope ratio of 2 horizontal to 1 vertical (2H:1V). The top width will accommodate two 12-foot traffic lanes and two 3-foot shoulders. The embankment thickness will vary along the route, depending on site-specific subsurface conditions, and the road embankment may or may not be insulated, in whole or in part, depending on thermal design criteria.
- Given that the entire project area is underlain by permafrost, the road will be constructed with a section that is structurally adequate for the anticipated loads and thermally adequate to prevent or minimize thawing of the subgrade soil.
- The road, bridges, culverts, and related structures will be designed to comply with the following guidance:
    - Alaska Highway Preconstruction Manual (ADOT&PF 2025)
    - American Association of State Highway and Transportation Officials (AASHTO) Guidelines for Geometric Design of Low-Volume Roads (2019). The assumed functional classification will be a Low-Volume Local Road, with a functional subclass of Rural Industrial/Commercial Access Road
    - AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications (AASHTO 2024)
    - Alaska Highway Drainage Manual (ADOT&PF 2006)
    - Memorandum of Agreement Between the Alaska Department of Fish and Game (ADF&G) and Alaska Department of Transportation and Public Facilities (ADOT&PF) for the Design, Permitting, and Construction of Culverts for Fish Passage (ADF&G 2001)
- The road will need to support the transport of heavy oil field vehicles and equipment, including modular units and drill rigs.
- Though the primary goal of the road is industrial use, it is also likely to be used by local residents of Kaktovik. The year-round gravel road will reduce the length and cost of the annual CWAT trail construction between the Prudhoe Bay O&G complex and the community of Kaktovik.

- The road will likely incorporate subsistence pullouts at regular intervals and may include pullouts with boat ramps at major river crossings.
- Road alignment alternatives will be developed to be consistent with the goals, objectives, and management guidelines of the NSAP (ADNR 2021).
- Significant river crossings (depending on the route) include the Sagavanirktok River (main and west channels), Kadleroshilik River, Unnamed River (tributary to Shaviovik River), Shaviovik River, Unnamed River (east of Shaviovik), Kavik River (side channel), and East Badami Creek. Large river crossings will require bridges, fish-passage culverts will be required for minor drainages along the route, and cross-drainage culverts will be needed in low-lying areas to accommodate runoff events.
- Where an aboveground pipeline parallels the road, best practices dictate that the road generally should be separated from the pipeline by 500 to 1,000 feet except at bridge crossings. Studies indicate that roads and adjacent aboveground pipelines can cumulatively influence caribou movement patterns. The Alaska Caribou Steering Committee concluded that the most effective mitigation is achieved when pipelines and roads are separated by at least 500 feet (Figure 5-1) (Cronin et al. 1994).

5.2 Roadway Points of Origin and Termini

The proposed roadway's point of origin will vary depending on the specific route being considered; alternative points of origin include the Dalton Highway, Endicott Road, and Deadhorse. Each alternative terminates by connecting with the Point Thomson road system, although the exact connection point varies by route.

Dalton Highway Origin. Under Alaska law, disposal or sale of state-owned lands is prohibited within 5 miles of the Dalton Highway ROW (AS § 19.40.200). This prevents private developers from acquiring land for new road projects within the corridor. Further, AS § 19.40.210 restricts the use of off-road vehicles on state-owned lands within the Dalton Highway Corridor Management Area. While the statute specifically references "off-road vehicles," the intent is to restrict vehicle traffic and preserve the undeveloped nature of the corridor, which would extend to the construction of a new roadway for general use. Limited exceptions in the statute allow for access by the O&G industry, holders of mining claims, trappers, and snowmachine travel.

Any plan to build a permanent access road within the Dalton Highway Legislatively Designated Area (LDA) would require approval from land managers at the ADNR, the ADOT&PF, and likely the ADF&G. An applicant would have to show that the new road is consistent with the NSAP (ADNR 2021) and demonstrate a public need for the project. Within the Dalton Highway Corridor, a state-owned and developed road would likely have a better chance of receiving permits than a privately funded road.

If the state funds construction of the road, then general public access will likely be required. This could raise concerns from nearby residents in Nuiqsut or Kaktovik that urban hunters or fishermen will increase pressure on traditional subsistence areas. If construction is funded by the O&G industry, access could be restricted to authorized O&G activities. Funding through a public-private partnership would likely allow flexibility for either approach (full public access or restricted access for the O&G industry).

Many of the oilfield service vehicles that travel the Greater Prudhoe Bay road system may not comply with ADOT&PF regulations for commercial vehicle size, weight, and permits prescribed in 17 Alaska Administrative Code (AAC) 25. If the Eastern Access Road originates from a point along the Dalton Highway, oilfield service contractors and operators will need to ensure that commercial vehicles traveling from Deadhorse or other locations within the Greater Prudhoe Bay oilfield area onto the Dalton Highway meet applicable regulatory requirements, including possession of a U.S. Department of Transportation (USDOT) number, required safety inspections, and commercial driver's licenses (CDLs) for the operators of vehicles exceeding a gross vehicle weight rating of 26,000 lb. Vehicles exceeding size or weight limits established under 17 AAC 25, 17 AAC 28, or 17 AAC 35 may only operate on the Dalton Highway under a special permit issued by ADOT&PF.

Endicott Road Origin. If the Eastern Access Road originates from Endicott Road, access would be restricted to only authorized O&G operations, since Hilcorp's guard station on Spine Road prevents general public access for travelers arriving via the Dalton Highway or the Deadhorse airport. With its origin at Endicott Road, the Eastern Access Road would be classified as an industrial oilfield road, and ADOT&PF highway restrictions for commercial vehicles would not necessarily apply. Funding for road construction would likely come from private investment by the O&G industry. If funding were provided exclusively by the State of Alaska, it could be more difficult to restrict access to the general public.

An origin at Endicott Road provides the advantage of an existing two-lane vehicle bridge crossing the main (west) channel of the Sag River. However, the bridge cannot accommodate drill rigs, and a new bridge will be necessary to cross the east channel of the Sagavanirktok River.

Deadhorse Origin. For a road originating from Deadhorse, access permissions would be related to funding sources. If construction is funded by the O&G industry, access could be restricted to authorized O&G activities. If construction is funded exclusively by the state, general public access would likely be required. Deadhorse is located within the LDA previously described in this section.

5.3 Alaska Department of Natural Resources North Slope Area Plan

As outlined by State of Alaska policy, the role of land use plans is "to establish a balanced combination of land available for both public and private purposes. The choice of land best suited for public and private use shall be determined through the inventory, planning, and classification

processes…" (AS 38.04.005). The NSAP applies to state-owned, state-selected, and top-filed lands in the study area and establishes both general and more specific goals, objectives, and management guidelines for the area as a whole and the six regions it contains (ADNR 2021). As shown in Figure 5-2, the study area comprises four of the six individual management regions of the NSAP: Arctic Tidelands, Arctic Coast, Central Slope, and the Dalton Corridor (ADNR 2021).

The proposed road should accommodate each of the NSAP's goals listed in Table 5-1 and objectives listed in Table 5-1.

Table 5-1 North Slope Area Plan General Goals

Theme	Description of Goal
Cultural Resources	Preserve, document, and interpret Alaska's cultural resources and heritage on all lands within the state.
Dismantlement, Removal, and Restoration (DR&R)	Through consultation with other land management and regulatory state agencies, and with input from local government, manage reuse or rehabilitation of predominantly O&G infrastructure, including establishing dismantlement, removal, and restoration requirements and timelines for post-lease land conditions.
Economic Development	Develop a minerals and energy industry which will provide stable and diverse job opportunities, increase per capita income, increase local tax revenues, and stimulate growth of non-resource-based industries by managing state land, water, and resources to support a vital, self-sustaining, local and statewide economy.
Environment and Habitat	Where possible, avoid or minimize the impact of uses, activities, and development on fish, bird, and wildlife habitats and the natural environment when siting commercial, industrial, or private settlements on state lands.
Fiscal Costs	Minimize the need for, and the fiscal cost of, providing government services such as schools or road maintenance activities when considering making lands available for private use (residential, commercial, or industrial).
Municipal Entitlement	Identify lands available for conveyance to provide a viable land base to municipal entities.
Pollution Remediation	Discharges, spills, or other releases of pollutants will be reported immediately upon discovery and remediated in a timely fashion by the responsible parties, as required by state and federal agencies.
Public Access	Provide access to public and private lands and resources to ensure adequate opportunities for the use of public resources.
Public Health and Safety	Maintain or enhance public health and safety for users of state land and resources.
Public Use	Provide, plan, enhance, and manage diverse opportunities for public use of state lands, including uses such as hunting, fishing, boating, and other types of recreation.

Theme	Description of Goal
Quality of Life	Maintain or enhance the quality of the natural environment including land, water, fish and wildlife habitat, and harvest opportunities; provide opportunities to view wildlife and the natural environment; and protect heritage resources.
Recreation	Encourage outdoor recreation on public lands and provide for a range of recreational experiences on state land managed for multiple uses while protecting natural resources and public access.
Settlement	Provide opportunities for private ownership and leasing of land currently owned by the state.
Subsistence Harvest Areas	Retain lands and waters where subsistence harvest occurs in state ownership to support traditional uses.
Sustained Yield	Manage renewable resources to maintain the long-term productivity and quality of renewable resources including fish and wildlife habitat.
Thermokarst	When planning new, or repurposing existing, infrastructure or other types of development, the applicant must consider and implement measures to minimize thermokarst formation. Where existing infrastructure and development exist and are not actively in use, the lessee shall maintain these sites to minimize thermokarst formation.
Water Quality	Provide adequate water quantity and quality to support subsistence and recreational uses; domestic, commercial, and industrial uses; and fish and wildlife production.

Source: ADNR 2021

Table 5-2 North Slope Area Plan General Objectives

Objective	Description
Oil and Gas Development	Provide opportunities for O&G development.
Lifestyle and Subsistence Protection	Protect local lifestyles, subsistence uses, and scenic qualities.
Community Connectivity	Enhance connectivity of communities within and outside the planning boundaries.
Infrastructure Access	Provide access to resources necessary for maintaining existing state infrastructure or developing new infrastructure.
Pollution Remediation	Maximize timely and thorough pollution remediation to minimize long-term impairment and monitoring needs according to state standards.
Habitat Protection	Maintain and protect habitats that support fish and wildlife populations and areas for subsistence harvest.

Source: ADNR 2021

5.3.1 General Guidelines Applicable to the Current Study

The following summarizes the NSAP's guidelines that apply to roadways (ADNR 2021).

5.3.1.1 Protection of Land Adjacent to High Value Waterbodies

Riparian buffers of 100 feet landward from the ordinary high-water line adjacent to anadromous waterbodies and streams and other freshwater waterbodies that have been determined to have public significance or where resources are determined to be significant.

5.3.1.2 Community Transport and Balancing Impacts with Potential Development

When designing or authorizing linear infrastructure that may affect communities and wildlife in the area, including transportation systems and pipelines, they should be co-located to reduce the surface area of impacted lands and consider the potential impacts on subsistence use, health and safety, and cultural preservation.

5.3.1.3 Transportation Corridors and Siting and Constructing Permanent Roads, Bridges, and Causeways

Permanent roads, bridges, and causeways will, to the extent feasible and prudent, be routed to avoid sensitive wetlands, avoid streams, and minimize alteration of natural drainage patterns, and avoid long-term adverse effects on fish and wildlife, water quantity or water quality, and permafrost. Transportation corridors that intersect or cross fish or wildlife movement areas shall be equipped with appropriate crossing devices or structures to allow the free and efficient bidirectional passage of species using the corridor.

5.3.2 Region-Specific Management Intents Relevant to the Current Study

5.3.2.1 Arctic Tidelands Region

The management intent for this region "is to be primarily managed for its O&G resources and values. Impacts associated with O&G leasing/development must consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate any potential negative effects. Also maintain opportunities for material sale/extraction in the area" and "to accommodate commercial, industrial and related uses or structures associated with marine transportation or adjacent upland uses."

5.3.2.2 Arctic Coast Region

The management intent for this region is "to be managed for its habitat and O&G resource values. All development must also consider potential impacts on the habitat and harvest

values and include general mitigation measures that will avoid, minimize, or mitigate negative impacts" and "to facilitate O&G operations at Point Thomson."

5.3.2.3 Central Slope Region

The management intent for this region is "to continue to provide opportunities for subsistence, hunting, fishing, material sales, among other beneficial public uses," and "oil and gas leasing/development may occur during the term of this plan, but must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate any potential negative effects."

5.3.2.4 Dalton Corridor Region

The management intent for this region is to "manage the unit as a utility and transportation corridor to facilitate transportation of O&G resources from the North Slope to facilities in other areas of the state and to support subsistence hunting, fishing, and gathering, recreation, and sport hunting opportunities. Linear transportation and infrastructure projects are appropriate within the unit." As it pertains to the Sagavanirktok River, the plan further states that the unit should be managed to "protect wildlife habitat and subsistence values, water quality, material resources, and public recreation opportunities."

5.4 Gravel Resources

The proposed road will require substantial amounts of gravel for embankment construction. Ideally, suitable gravel sources should be located at intervals of 10 miles or less along the preferred alignment to facilitate efficient and cost-effective construction. Each site would ideally contain at least 1 million cubic yards (cy) of material to provide for construction of the embankment and future maintenance needs.

East of the Colville River, rivers have their sources high in the Brooks Range and have coarse gravel beds far into the Arctic Coastal Plain. Consequently, gravel reserves for construction along the eastern North Slope are more plentiful when compared with areas farther west, like the National Petroleum Reserve–Alaska (NPR-A) where the Arctic Coastal Plain is dominated by fine sand and silt.

5.4.1 Existing Gravel Mine Sites

Existing gravel mine sites within or near the project area are shown in Figure 5-3 and include the following:

- Duck Island mine site located east of Drill Site 9 along Endicott Road. The site is inactive, depleted, and currently used as a water source (Hilcorp 2025).

- Badami mine site located southeast of the Badami airstrip. The material site is inactive but remains open and contains additional gravel reserves (Alaska Division of Lands [ADL] 416096).
- Point Thomson mine site located northeast of the Point Thomson airstrip. The existing pit is closed; however, additional gravel reserves are available, and the area could be reopened for further mining activity (ADL 419827).
- For the proposed Liberty Development, potential material sites were identified north of the Badami pipeline on a river island west of the Kadleroshilik River main channel (Liberty Material Site); and just east of the Kadleroshilik River (Shell Site 2) (DMA 1998).
- The ADOT&PF maintains numerous material sites along the west boundary of the project area adjacent to the Dalton Highway. Nearly all these sources are scheduled for mining to support Glenfarne's Alaska LNG project if it moves forward:
    - ID No. 65-9-102-2 at MP 411.5 on the west side of the highway just south of Deadhorse
    - ID No. 65-9-101-2 at MP 403.5 on the west side of the highway
    - ID No. 65-9-100-2 at MP 399.5 on the east side of the highway beside the Sagavanirktok (Sag) River
    - ID No. 65-9-026-2 at MP 398 within the Sag River floodplain
    - ID No. 65-9-099-2 at MP 390 alongside and within the Sag River floodplain
    - ID No. 65-9-024-2 at MP 381 alongside and within the Sag River floodplain
    - ID No. 65-9-038-2 at MP 367 alongside and within the Sag River floodplain
    - ID No. 65-9-096-2 at MP 364.5 on the east side of the highway
    - ID No. 65-9-074-2 at MP 354.5 (a.k.a. Last Chance Wayside) on the west side of the highway
    - ID No. 65-9-072-2 at MP 344 (a.k.a. 73 Mile Pit) on the east side of the highway and within the Sag River floodplain
    - ID No. 65-9-071-2 at MP 342 (a.k.a. 342 Mile Pit) straddling the highway on both sides including the Sag River floodplain
    - ID No. 65-9-0005-2 (a.k.a. Happy Valley Airport Sites, MS 124-2), ID No. 65-9-0005-2 Parcel A (a.k.a. Happy Valley Creek), and ID No. 65-9-0005-2 Parcel B (a.k.a. Happy Valley Camp Pit) at MP 334.5 near the Happy Valley Airstrip on the east side of the highway
    - ID No. 65-9-061-2 at MP 306 (a.k.a. Sag Maintenance Camp Pit) east of the highway

5.4.2 Potential Material Sources

The primary sources of material for the proposed road are expected to be found in sand and gravel in beach deposits (Qb), alluvial deposits (Qa, Qac, Qai, and Qat) associated with the rivers, and glacial outwash deposits (Qo). Figure 5-3 shows a map depicting our interpretation of sand and gravel deposits in the project area. The figure was developed using unpublished terrain unit data from DGGS as well as derivative geologic materials maps by Stevens et al. (2003a, 2003b). The map indicates high potential for sand and gravel along the major rivers and streams and in delta and coastal deposits.

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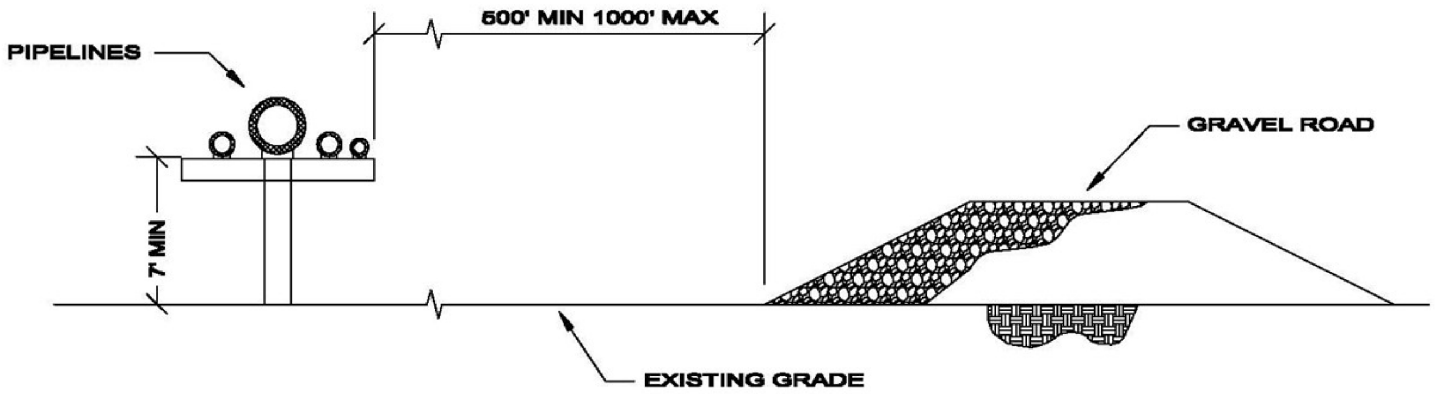

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ROADWAY SEPARATION

Eastern Access Road Study

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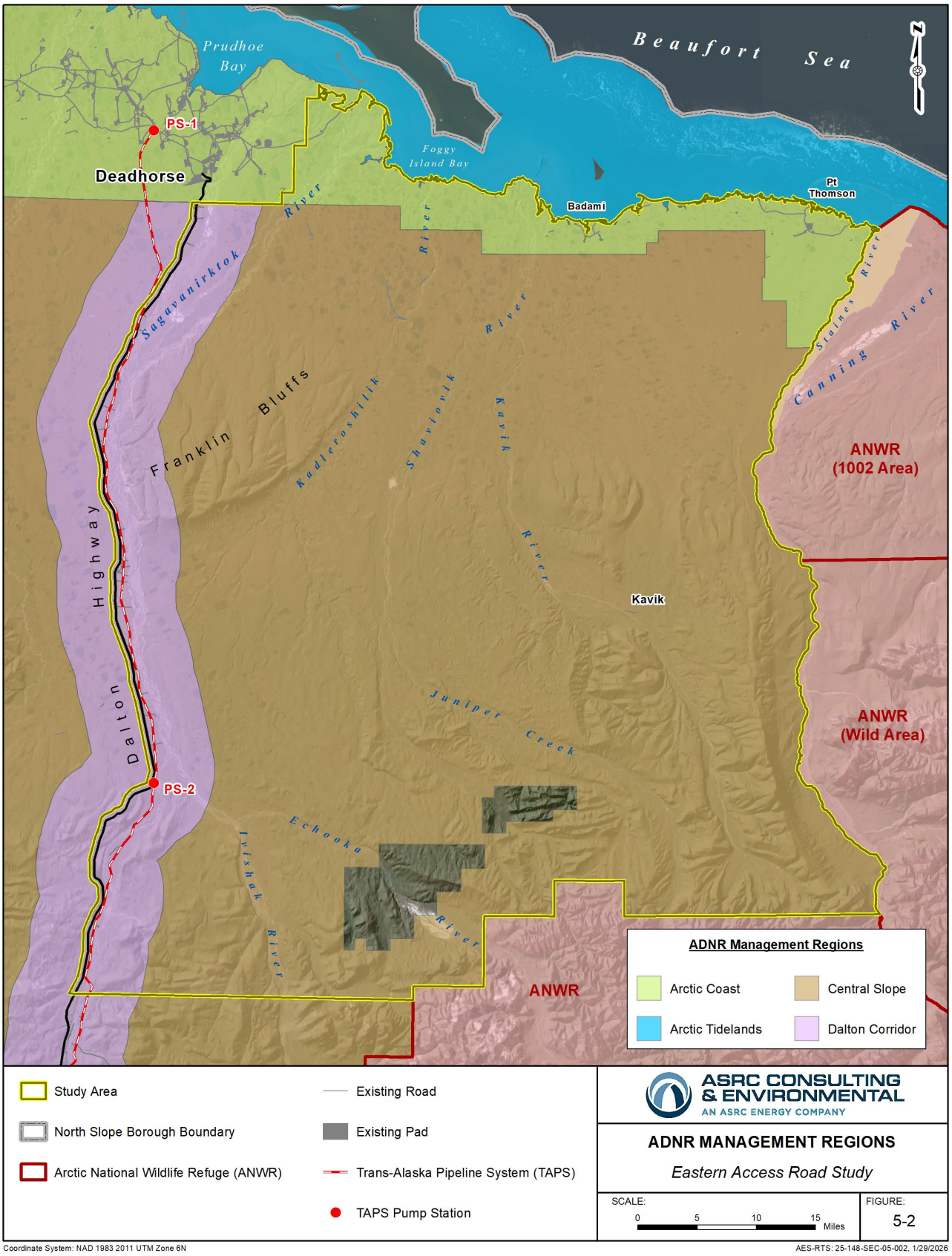
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Eastern Access Road Study
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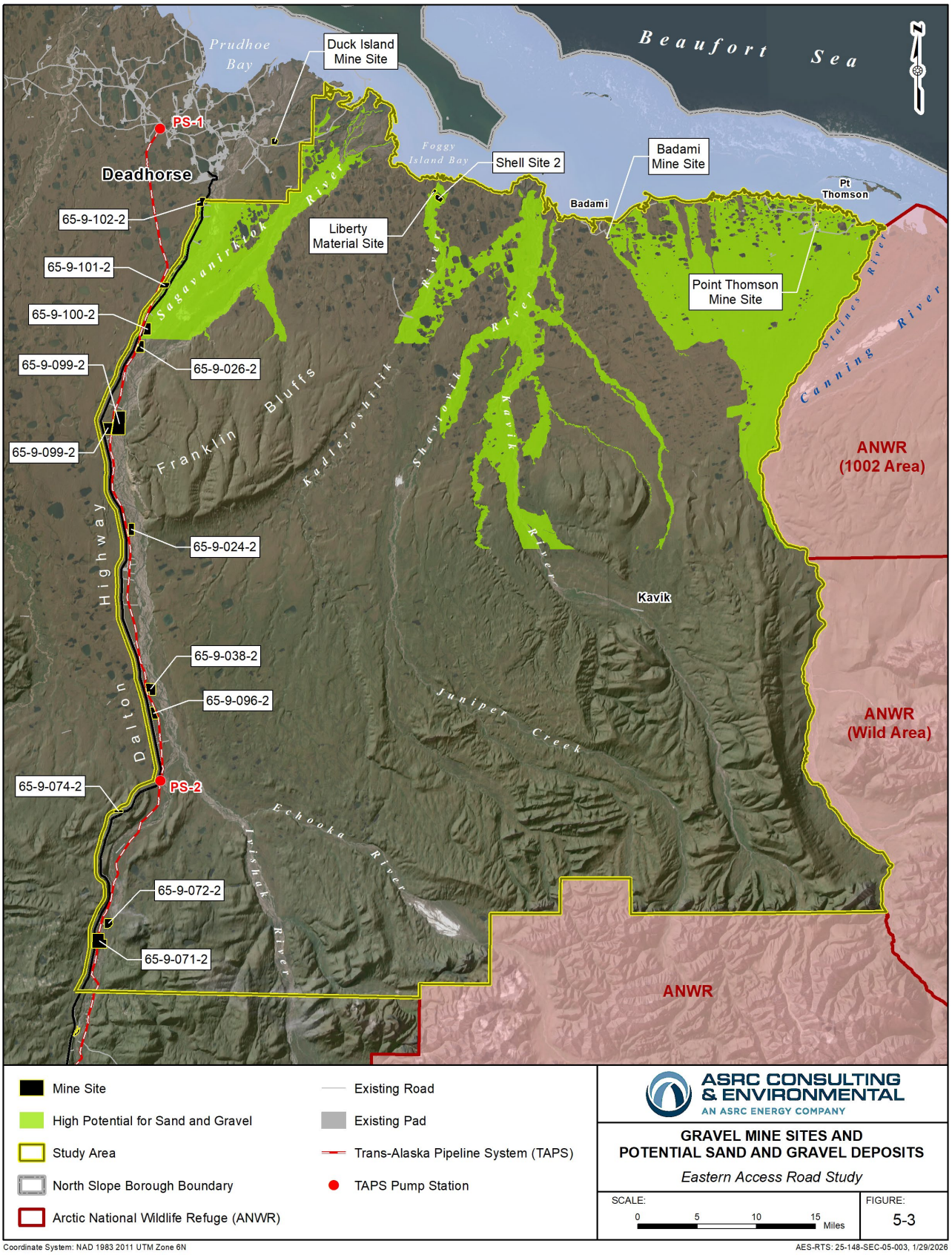
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Beaufort Sea
Duck Island Mine Site
PS-1
Deadhorse
Foggy Island Bay
Shell Site 2
Badami Mine Site
Badami
Pt Thomson
65-9-102-2
Liberty Material Site
Sagavanirktok River
65-9-101-2
65-9-100-2
Point Thomson Mine Site
65-9-099-2
65-9-026-2
Staines River
Canning River
Franklin Bluffs
Kadleroshilik River
Shavieovik River
65-9-099-2
ANWR (1002 Area)
Dalton Highway
65-9-024-2
Kavik
65-9-038-2
65-9-096-2
Juniper Creek
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PS-2
Echooka River
Ivishak River
65-9-072-2
65-9-071-2
ANWR
Mine Site
High Potential for Sand and Gravel
Study Area
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GRAVEL MINE SITES AND POTENTIAL SAND AND GRAVEL DEPOSITS
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6.0 LAND, ENVIRONMENTAL, AND CULTURAL RESOURCES

Notwithstanding the O&G resources and roadway considerations presented in previous chapters, the following sections outline additional GIS inputs and available datasets used to develop route alternatives, including land tenure, fish and wildlife, cultural and paleontological resources, subsistence resources, hydrology, wetlands, and physiography.

Information used for GIS input is based on records readily available online from public sources, including the U.S. Fish and Wildlife Service (USFWS), the Alaska Department of Fish and Game (ADF&G), the North Slope Science Initiative, the AOGCC, the National Hydrography Dataset, the NSB, the ADNR, the DGGS, the BLM, the National Wetlands Inventory (NWI), and the Alaska Heritage Resources Survey (AHRS).

6.1 Land Tenure

Land tenure in the study area strives to describe the sometimes-complex relationship between the land and the people who live, work, or use it for resource development. This includes a discussion of land ownership, O&G leases (described in Section 1.0), other resource claims, rights-of-way, areas of critical environmental concern, easements, zoning, and land classifications.

6.1.1 Surface Land Ownership

Surface land ownership within the project area consists of a mixed ownership pattern of state land, North Slope Borough (NSB) land, Native corporation land, and Native allotments. Figure 6-1 presents a generalized summary of land ownership. Federal surface land that was the site of the former Bullen Point Short Range Radar Site was conveyed from the U.S. Air Force to the State of Alaska after remediation was deemed complete in 2008.

Most of the state land consists of general domain land, which is governed by AS 38 statutory requirements and by the associated Alaska Administrative Code (11 AAC 96). This land is to be managed for multiple use and sustained yield of the area's renewable resources, although state land use plans can direct this management toward particular uses, including O&G development. ADNR is responsible for managing the general domain lands that are owned by the state across the North Slope.

6.1.2 Native Allotments

As with all private properties, authorization must be obtained before accessing or conducting work on these lands. Typically, the U.S. Bureau of Indian Affairs (BIA) is the point of contact for contacting allotees to negotiate access across and to Native allotments. Within the study area, the Iñupiat Community of the Arctic Slope (ICAS) assists the BIA in carrying out this function. ICAS is a

recognized tribe under the Indian Reorganization Act of 1934 and represents the Iñupiat people of the Arctic Slope (ICAS 2025). Within the study area, two Native allotments are along the coastline, two are on the Shaviovik River, and one near the Kadleroshilik River in the vicinity of the Jacob's Ladder road and airstrip (Figure 6-1).

6.1.3 Arctic Slope Regional Corporation Lands

Arctic Slope Regional Corporation (ASRC) owns surface lands in the Arctic Foothills region as shown in Figure 6-1. As with all private properties, authorization must be obtained before accessing or performing work on these lands.

6.1.4 Current Oil and Gas Leases

Current O&G leases within the project area are presented in Section 2.0, Figure 2-3.

6.1.5 Mining Claims

Although most state lands in the project area remain open to mineral entry, ACES's research indicates that there are no pending or active state or federal mining claims in the study area. One closed state mining claim is near Franklin Bluffs.

6.1.6 Areas of Critical Environmental Concern

Areas of Critical Environmental Concern (ACECs) are lands designated under the Federal Land Policy and Management Act of 1976 to protect valuable environmental and cultural resources and scenic areas. ACECs require special management by the Bureau of Land Management (BLM). The study area is part of the planning area boundary for the Central Yukon (BLM 2024) and Utility Corridor (BLM 1989) management plans; however, no BLM managed or administered public lands are within the study area and therefore are not subject to BLM records of decision or planning documents.

6.1.7 Existing Land Easements and Rights-of-Way

A variety of land easements and ROWs are established within the project area as discussed below. Figures 6-2 and 6-3 show the locations of these easements and ROWs.

6.1.7.1 ADL 63826 – Dalton Highway Easement/Haul Road

The Dalton Highway Easement/Haul Road holds a public easement issued to the ADOT&PF for a ROW of 200 feet in width and 53.299 miles in length containing 1,292.08 acres. The initial application was received by ADNR Lands in April 1974 for the purposes of construction, operation, and maintenance of a "haul road between the Yukon River and Prudhoe Bay." The easement was issued in 1984 to ADOT&PF.

6.1.7.2 ADL 63574 - Trans Alaska Pipeline ROW

ADL 63574 refers to the state ROW lease covering 344 miles of state-owned land in the Trans Alaska Pipeline System ROW. The entire TAPS system covers approximately 800 miles, and includes a 48-inch diameter pipeline, 11 pump stations (of which only four are currently in use), the Valdez Marine Terminal, and various support facilities. On state lands, the ROW measures 100 feet in width. On federal lands, the ROW measures 54 feet in width where the pipe is buried, and 64 feet in width where the pipe is elevated. On private lands, the ROW may measure anywhere between 54 and 300 feet in width.

As part of electrification and automation upgrades to the pump stations, Alyeska Pipeline Service Company, which operates TAPS, maintains a supporting fuel gas line extending from Pump Station 1 to the three remaining pump stations south of Pump Station 1. It parallels the Dalton Highway from Milepost 414 to Pump Station 4, measuring approximately 149 miles in length. The supporting fuel gas line measures 10 inches in diameter from Milepost 414 to Milepost 380 of the Dalton Highway (approximately 34 miles), and 8 inches in diameter from Milepost 380 to Pump Station 4 (approximately 115 miles).

6.1.7.3 ADL 418997 - The Alaska Stand Alone Gas Pipeline ROW

Originally leased in July 2011 to the Alaska Gasline Development Corporation, the Alaska Stand Alone Gas Pipeline ROW is intended to house a buried natural gas pipeline. As originally proposed, the project included a Gas Conditioning Facility on the North Slope, a 700-mile pipeline that tied into the ENSTAR Natural Gas Company system near Point Mackenzie, a 30-mile pipeline spur to Fairbanks, and a number of additional potential tie-in points. After a series of amendments finalized in April 2018, the total ROW covers 9,399 acres, with 380 miles of mainline pipeline and a 20-mile spur to Fairbanks, all on state lands.

6.1.7.4 ADL 421297 - The Alaska LNG Gas Treatment Plant-Mainline-LF ROW

The Alaska LNG Gas Treatment Plant-Mainline-LF ROW is intended to house a pipeline that would transport natural gas from the Alaska LNG Gas Treatment Plant near Deadhorse to the Alaska LNG Liquefaction Facility in Nikiski, approximately 807 miles to the south. The ROW lease, as applied for in January 2021, encompasses the Gas Treatment Plant, the 0.5-mile Prudhoe Bay Transmission Line, the Marine Facility, and approximately 452 miles of the pipeline. The Alaska Gasline Development Corporation requested a 110-foot-wide ROW for the purposes of construction, and 53.5-foot-wide ROW for operations. The acreage of the ROW would occupy 50,570 acres of state land for construction, and 3,631 acres during operations.

6.1.7.5 ADL 410562 - The Endicott Pipeline ROW

The Endicott Pipeline ROW, as issued in January 1985, was for the construction of the pipeline beginning at Pump Station No. 1, running east/northeast across the Sagavanirktok River, and then north/northwest across the tidelands to the Endicott Main Production Island. In August 1986, the ROW lease for operation noted that the ROW area covered 1,072.636 acres. A reissued lease for operation in January 2010 noted the updated ROW area as 1,069.12 acres.

6.1.7.6 ADL 412401 - Public Easement

The public easement is currently held by Hilcorp North Slope LLC and provides for a permanent gravel road for public access to the Duck Island Unit facilities in conjunction with the Endicott Pipeline. The ROW measures approximately 500 feet in width and 11 miles in length.

6.1.7.7 ADL 420871 and 420872 – The Liberty Pipeline

The Liberty Pipeline and its related facilities are located on state lands and waters, originating on Liberty Island and connecting to the Badami Pipeline. The total proposed length of the pipeline is approximately 7.1 miles, of which approximately 6 miles are within or on state land. The Liberty Pipeline will include a sales oil and utility natural gas line.

6.1.7.8 LAS 28591 - The Savant "ROW"

The Savant "ROW" is a Miscellaneous Land Use Permit of approximately 100 acres for off-road travel for routine maintenance and survey on the Badami pipeline and facilities both in winter and non-winter conditions. Savant may also use the ROW to support exploration or development projects where tundra travel is warranted. The ROW application was submitted to ADNR Lands in June 2012, and approval was effective August 2012. The approval was reissued by ADNR Lands in 2017, and administration of the ROW was transferred to ADNR DOG in June 2023 per ADNR Department Order 21 (consolidated all land authorizations related to O&G on the North Slope under DOG). Its status is "issued." The permit covers state lands from the Colville to the Canning rivers, which means that Savant would need to submit an off-road travel request with information on the specific route it would want to use.

6.1.7.9 ADL 415472 - Badami Sales Oil Pipeline ROW Lease

The Badami Sales Oil Pipeline ROW Lease, as approved in July 1996, serves to house the elevated pipeline and three buried river crossings over a 25.1-mile route extending from the Badami Central Processing Unit to a tie-in point on the Endicott Pipeline. The ROW measures a total of 300 feet in width, excepting the buried crossings at the east channel of the

Sagavanirktok River, the Kadleroshilik River, and the Shaviovik River, where the ROW expands to 2,000 feet in width. This expanded ROW width extends across each of the channels from bank to bank, plus an additional 500 feet up the banks. Additionally, on the east side of each river crossing, the ROW includes a 300-foot-wide temporary workspace up the bank. This original lease for ADL 415472 covered approximately 1,240 acres.

The Badami Sales Oil Pipeline ROW lease for operation and maintenance, as granted in August 2012, amended the ROW width to approximately 60 feet except where otherwise depicted on surveys, amending the total acreage for ADL 415472 to 186.91 acres.

6.1.7.10 ADL 415965 - Badami Utility Pipeline ROW

The Badami Utility Pipeline ROW is approximately 34.3 miles in length and extends from the Endicott Main Production Island to the Badami Central Processing Unit at Mikkelsen Bay. As issued in December 1997, the ROW measures 5 feet in width on either side of the elevated pipeline, excepting the length between the Endicott Tie-In and the Endicott Main Production Island, where the ROW measures 300 feet in total width. The Badami Utility Pipeline crosses the No Name River aboveground and crosses the Kadleroshilik River, the Shaviovik River, and the east channel of the Sagavanirktok River in buried crossings. As of December 1997, the ROW for ADL 415965 included approximately 352.1 acres.

The Badami Utility Pipeline ROW for operations, as granted in December 2012, included new records of survey of the ROW, and amended its total width to 60 feet, with varying width at each pad expansion. Total acreage for the Badami Utility Pipeline ROW Lease for operation was amended to approximately 232.72 acres.

6.1.7.11 LAS 27254 – The Hilcorp ROW

The Hilcorp ROW is a Miscellaneous Land Use Permit issued by ADNR Lands to Exxon to conduct research and scientific monitoring on state land in support of the design and permitting of the Point Thomson Project. The originally permitted activities included hydrology studies such as stream gauges and water monitoring sites using data loggers and benchmarks. Multiple amendments to the permit have added a meteorological station, additional hydrologic sites, placement of two noise collection structures, a tidal gauge, visual baseline data sites, and the placement and operation of caribou study cameras. It was assigned to Hilcorp when it became the PTU operator in 2021. The permit was also transferred to ADNR DOG in 2023 per ADNR Department Order 21.

6.1.7.12 ADL 421296 - The Alaska LNG Point Thomson Transmission Line ROW Lease

The Alaska LNG Point Thomson Transmission Line ROW Lease is intended to transport natural gas in an elevated pipeline from the Point Thomson Unit Central Pad to the Gas

Treatment Plant located near Deadhorse, approximately 63 miles to the west. The ROW measures approximately 80 feet in width for the purposes of operations, is primarily located on state land, and will cover approximately 611 acres once complete.

6.1.7.13 ADL 418975 Point Thomson Export Pipeline

ADL 418975 refers to a pipeline ROW lease containing approximately 1,100 acres extending from the Point Thomson Central Pad to the east end of the Badami Sales Oil Pipeline. The pipeline ROW is 100 feet wide, situated 50 feet on either side of the vertical support member (VSM) centerline. At the east end, the lease also includes a 55-foot by 72-foot metering pad site, connecting to a 40-foot-wide road, and containing approximately 267 acres.

6.1.8 Buffers, Easements, and Setbacks Pertaining to State-Owned Waterbodies

Per the NSAP guidelines summarized in Section 5.3.1, a 100-foot landward buffer from the ordinary high-water line adjacent to anadromous waterbodies will be considered for route alignments (Figure 6-4).

6.1.9 North Slope Borough Zoning

The NSB, incorporated in 1972, is a home rule borough and is the largest borough in Alaska. The NSB has permitting and land management authority for activities within the region. Figure 6-5 shows the following Borough zones that fall within the project area: Resource Development, Transportation Corridor, and Conservation (NSB 2005). Any major resource exploration and development project within the Conservation zone would have to apply for rezoning to the Resource Development classification (NSB 2019b).

6.1.10 Alaska Native Claims Settlement Act Section 17(b) Easements

Alaska Native Claims Settlement Act (ANCSA) Section 17(b) easements are rights reserved to the United States and may also be reserved to and from communities, airports, docks, marine coastlines, groups of private holdings sufficient in number to constitute public use, and government facilities. They take the form of 60-foot-wide roads, 25- and 50-foot-wide trails, and one-acre sites for short-term uses. These rights are reserved when the BLM conveys land to an Alaska Native corporation under ANCSA. There are no 17(b) easements across public lands. The purpose of most Section 17(b) easements is to allow the public to cross private property to reach public lands and major waterways (43 Code of Federal Regulations [CFR] § 2650.4-7). No ANCSA Section 17(b) easements are located within the study area.

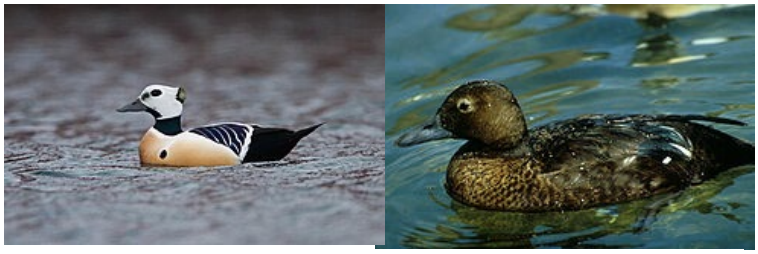
6.1.11 State Management Units

The NSAP regions described in Section 5.3 are separated into smaller geographic units called management units (ADNR 2021). Individual units of state lands are classified by the resources they possess and the land's general use. Up to three designations can be used to represent the uses and resources for general management planning. The majority of the study area falls within the Kavik River, Kadleroshilik River, and Eastern Range units of the Central Slope Region of the NSAP. Units within the study area with designations, primary management intents, and resources and uses are summarized in Appendix B and shown in Figure 6-6.

6.2 Fish and Wildlife

6.2.1 Birds

Avian resources are an important biological and subsistence resource across the North Slope. The North Slope supports seasonally large populations of birds, including important breeding populations of over 90 species of migratory and resident birds. Coastal areas provide molting and fall staging areas for large numbers of waterfowl, seabirds, and shorebirds. Since many of these seasonal summer inhabitants use the area as nesting habitat, impacts to avian resources in the area can affect their populations in other parts of the world. In general, areas of concentrated avian use include lagoons, river deltas, lakes, coastal salt marshes, and associated wetlands.



Male (left) and female (right) Steller's eider (Wikipedia 2025)

Birds, nests, and avian habitats are protected from disturbance through a variety of federal regulations. Almost all bird species inhabiting the North Slope are protected from impacts by the Migratory Bird Treaty Act (MBTA). The MBTA actively protects nesting birds from disturbance on both federal and state lands. Regulatory agencies can restrict ground disturbance during nesting periods, typically between June 1 and July 31 (USFWS 2017).

On the North Slope there are three birds, Stellar's and Spectacled Eiders and Yellow-billed Loons, listed as threatened according to the Endangered Species Act of 1997.

Steller's eider. The Steller's eider (*Polysticta stelleri*) is a small sea duck with an estimated population of up to 5,000 seasonally inhabiting the North Slope starting in mid- to late May. Nesting, incubation, and hatching take place throughout the summer, with final fledging occurring in September (USFWS 2025a; Rothe and Arthur 2000). The Steller's eider is currently listed as a threatened species under the Endangered Species Act (ESA). According to the USFWS, no designated critical habitat for the Steller's eider occurs within the study area (2025a). Its general

habitat includes the northern portion of the Arctic Coastal Plain and areas along the Sagavanirktok River.

Spectacled eider. The spectacled eider (*Somateria fischeri*) is a large sea duck with an estimated population of 8,000–10,000 seasonally inhabiting the North Slope starting in mid-June. Nesting, incubation, and hatching take place in July and August, with final fledging occurring in late August (ADF&G 2025a; Rothe and Arthur 2000). The spectacled eider is currently listed as a threatened species under the ESA. According to the USFWS, there is no designated critical habitat for the spectacled eider in the study area. Its general habitat includes the coastal portion of the study area. Seabird studies conducted across the North Slope, and more specifically around the Point Thomson Unit, suggest that breeding pairs of spectacled eiders are most likely to be found in the northwestern portion of the study area, with the furthest east observed near Bullen Point and Point Sweeney (Troy Ecological Research Associates 2002). A 2011 survey of waterfowl breeding populations on the Arctic Coastal Plain suggested that spectacled eider populations are increasing (Larned et al. 2012).

Male (left) and female (right) spectacled eider (Wikipedia 2025)

Yellow-billed loon. The yellow-billed loon (*Gavia adamsii*) is a large lake-dwelling bird seasonally inhabiting the North Slope starting in late May. Nesting, incubation, and hatching take place throughout summer, with final fledging occurring in September (ADF&G 2025b). The yellow-billed loon is currently listed as a threatened species under the ESA. According to the USFWS, there is no designated critical habitat for the yellow-billed loon in the study area. Its general habitat includes the coastal region of the study area.

Yellow-billed loon (Wikipedia 2025)

6.2.2 Terrestrial Mammals

Many terrestrial mammal species may exist in and around the study area. Table 6-1 provides information on many of the larger mammal species present.

Table 6-1 Large Terrestrial Mammals Known to Live in or Around the Study Area

Common Name	Scientific Name	Occurrence in Study Area
Polar bear	*Ursus maritimus*	Known along the northern portion of the study area into the Arctic National Wildlife Refuge
Grizzly bear	*Ursus arctos*	May be present

Common Name	Scientific Name	Occurrence in Study Area
Caribou	*Rangifer tarandus*	The Central Arctic herd and the Porcupine herd inhabit portions of the study area
Muskox	*Ovibos moschatus*	Known herd inhabits the eastern portion of the study area into the Arctic National Wildlife Refuge
Moose	*Alces alces*	May be present
Arctic fox	*Vulpes lagopus*	Arctic foxes are the most common furbearers in the Arctic Coastal Plain
Red fox	*Vulpes vulpes*	May be present
Gray wolf	*Canis lupus*	May be present

In addition to the large mammals listed in Table 6-1, several small mammal species inhabit the area, including the following:

- Arctic ground squirrel (*Urocitellus parryii*)
- Brown lemming (*Lemmus trimucronatus*)
- Ermine (*Mustela ermine*)
- Lynx (*Lynx canadensis*)
- Singing vole (*Microtus miurus*)
- Tundra shrew (*Sorex tundrensis*)
- Barren ground shrew (*Sorex ugyunak*)
- Collared lemming (*Dicrostonyx groenlandicus*)
- Least weasel (*Mustela nivalis*)
- Northern red-backed vole (*Myodes rutilus)*
- Snowshoe hare (*Lepus americanus*)
- Tundra vole (*Microtus oeconomus*)

The USFWS is charged with the management of polar bears, which are protected under the Marine Mammal Protection Act (MMPA) and the ESA. Both the MMPA and the ESA prohibit unauthorized "take" of marine mammals such as polar bears. A take may include any disturbance to a polar bear that changes its pattern of behavior, including disturbances to feeding, denning, or travel behaviors, as well as injuring and killing. Construction, operation, and maintenance of permanent infrastructure in polar bear critical habitat require USFWS authorization for incidental take and may require mitigation measures such as forward-looking infrared (FLIR) surveys to identify active denning locations for avoidance.

The ADF&G monitors population trends and manages big game species and other mammal populations in the state. To facilitate caribou management decisions, the ADF&G compiles annual caribou herd reports summarizing abundance surveys and monitoring results. Land Use Permits from the State of Alaska will likely not require extensive monitoring of caribou or other terrestrial mammals.

NSB permits or authorizations may include mitigation measures and monitoring requirements for caribou and other mammals, which are important subsistence resources for local communities and seasonal hunters.

Among the terrestrial mammals present in the study area, polar bears and caribou are of particular regulatory and subsistence importance and are therefore described in greater detail below.

- **Polar bear (*Ursus maritimus*).** Polar bears' typical breeding season is March through May. Polar bears are active throughout the summer, and females begin denning activities in October and November. Dens are dug where snow can accumulate, usually along a riverbank, coastal bluff, or on sea ice. Cubs are typically born in December and January and stay in dens until March or early April, when they leave the den and become more active on the landscape (ADF&G 2025c). According to the USFWS endangered species critical habitat map (Figure 6-7), a significant portion of the study area's northern boundary and eastern half overlaps with polar bear critical habitat.
- **Caribou (*Rangifer tarandus*).** Caribou on the North Slope typically calve in early June. Alaskan caribou herds use distinct areas for calving. During the summer months, caribou usually travel in herds and disperse more in August and rut in late September (ADF&G 2025d). According to the ADF&G, two caribou herds are known to use the study area: the Central Arctic herd and the Porcupine herd, with estimated populations of 34,000 and 218,000, respectively, in 2022 (ADF&G 2022). Details about each herd follow:
    - The Central Arctic herd's range typically overlaps the majority of the project area (Figure 6-9). According to data from 2013–2017, the herd's calving areas typically occur in two areas on the Arctic Coastal Plain; east of Nuiqsut, and east of the Dalton Highway (Figure 6-8) (Lenart 2021). The ADF&G maintains radio collars on individuals within the Central Arctic herd and, in partnership with the University of Alaska Anchorage, provides publicly available Geographic Information System (GIS) data on the herd beginning in 2019 (Alaska Center for Conservation Science 2017).
    - The Porcupine herd typically ranges outside of the project area from the Canning River and its headwaters east into Canada and south through the Canadian Yukon; for this reason, herd management is shared with Canada, and radio collar data is provided through the primarily Canadian Porcupine Caribou Management Board (2025). According to data from 2018 to 2022, the herd typically calves within ANWR south of Kaktovik (Figure 6-9) (M. Nelson 2025).

6.2.3 Fish and Anadromous Waters

The ADF&G has statutory responsibility for protecting anadromous fish habitat under the Anadromous Fish Act, AS § 16.05.871-.901. According to the ADF&G Anadromous Waters Catalog, 13 anadromous fish streams exist in the study area, with 9 affecting road routing and requiring bridges for the route alternatives (Table 6-2 and Figure 6-4) (ADF&G 2019).

Table 6-2 Anadromous Streams Identified in the Study Area

Anadromous Water Code	River Name or Location
330-00-10360	Sagavanirktok River
330-00-10361	West Channel Sagavanirktok River
330-00-10330	East Sagavanirktok Creek
330-00-10320	Kadleroshilik River
330-00-10310-2006	Unnamed River (Tributary to Shaviovik River)
330-00-10310	Shaviovik River
330-00-10300	Unnamed River (east of Shaviovik River)
330-00-10290	East Badami Creek
330-00-10310-2041	Kavik River

Source: Anadromous Waters Catalog (ADF&G 2019).

6.3 Cultural and Paleontological Resources

Cultural and paleontological resources include prehistoric, historic, and traditional land-use sites, areas, and objects. Both the State of Alaska and the NSB maintain cultural resources databases, as listed below:

- The Office of History and Archaeology's (OHA's) Alaska Heritage Resources Survey (AHRS) is a long-term database of more than 45,000 reported prehistoric, historic, and modern cultural resources (e.g., archaeological sites, buildings, structures, objects, or locations) and some paleontological sites. 154 sites were found in the study area for avoidance considerations.
- The ADNR Division of Mining, Lands, and Water maintains the Revised Statute 2477 trail database of historic ROWs. Two trails were found in the study area for avoidance considerations.
- The Traditional Land Use Inventory (TLUI) maintained by the NSB's Iñupiat Heritage, Language, and Culture department is a database of prehistoric, historic, and traditional cultural resource or landscape locations that contribute to the understanding of the historical record of the people and villages in their use lands within the NSB. There are 22 TLUI sites in the study area for avoidance considerations.

The above data sets were used for GIS modeling, and a Secretary of the Interior-qualified archaeologist assisted in cultural resources data analysis for the study area (Figure 6-10).

6.4 Subsistence Use Areas

The NSB maintains data sets for cabins, camps, and subsistence use areas known across the North Slope. Data showed one cabin in the project area.

Several subsistence studies have taken place on the North Slope with some results for subsistence harvest practices taking place within the study area. For the harvest years between 1995 and 2006, SRBA (2010) conducted a thorough investigation of the subsistence practices for the people of Utqiaġvik, Nuiqsut, and Kaktovik. The study showed that residents from Utqiaġvik stayed west of the Sagavanirktok River. Nuiqsut residents traveled west as far as Utqiaġvik and as far east as the Kadleroshilik River. Kaktovik residents reported harvesting within the study area, as far west as the Sagavanirktok River and as far east as Inuvik, Northwest Territories, Canada.

Given the overlapping range of reported subsistence use for residents in both Nuiqsut and Kaktovik, the entirety of the project area should be assumed to be used for subsistence. Discussions of the target harvest species for the study area or the coastal area to the north of the study area will be discussed below for Nuiqsut and Kaktovik.

6.4.1 Nuiqsut

For the study years of 1996 to 2006, residents of Nuiqsut used both the coastal waters north of the project area, and the terrestrial areas within the project area for their subsistence activities (SRBA 2010). Coastal harvests were generally conducted in the summer to fall months, when seals were harvested closer to the mainland, while eiders and bowhead whales were harvested beyond the outer islands. All of these species were typically harvested from boats.

Caribou harvest was a year-round endeavor, with June through September being peak months, though these harvest attempts coincide with other harvest attempts for marine mammals (SRBA 2010). Other terrestrial mammal harvests that occurred within the project area include wolves and wolverines. These harvests were conducted during the winter or spring months (SRBA 2010).

6.4.2 Kaktovik

For the study years of 1996 to 2006, residents of Kaktovik used both the coastal waters north of the project area and the terrestrial areas within the project area for their subsistence activities (SRBA 2010). Eiders and four species of geese were harvested in the project area or its coastline. Fish harvested included Arctic char, Arctic cisco, broad whitefish, and burbot; and terrestrial mammals included caribou, wolves, and wolverines. Marine mammals harvested by Kaktovik residents included bearded seals, ringed seals, and walruses. Bowhead whale harvests occur primarily to the east of the study area, between Camden Bay and the Canadian border (SRBA 2010).

The most extensive use of the study area was for caribou harvests. The harvest area over the 10-year period of 1996 to 2006 extended from the Canning River to the Sagavanirktok River and extended into the interior as far as 40 miles to include the Franklin Bluffs and the Kavik River. Much like Nuiqsut, Kaktovik residents harvested caribou primarily from boats (SRBA 2010).

Fish were generally harvested between the Canning River and East Badami Creek, with interior efforts at the Sagavanirktok River and the Shaviovik River. All but Arctic char were summer and early fall efforts, whereas the Arctic char were sought year-round (SRBA 2010). Bird harvests occurred along the coast between the Canning River and the Sagavanirktok River. Marine mammal harvests were generally conducted within the coastal areas offshore from the study area between the Canning River and the Sagavanirktok River in areas such as Cross and Flaxman islands. These harvests were almost exclusively done by boat between March and September, with July and August being peak season (SRBA 2010). Walruses were uncommon in the area and were considered opportunistic. Wolves and wolverines were generally harvested in the interior, either at the northeast portion of the Franklin Bluffs or approximately 40 miles to the interior between the Canning and Kavik rivers (SRBA 2010). Generally, the harvests occurred during the winter to spring months and almost exclusively by snowmachine (SRBA 2010).

6.5 Hydrology

Hydrology studies provide inputs to engineering efforts as well as inputs for mitigating impacts to floodplains and channel morphology, with a focus on maintaining the integrity of the project area's waterways and adjoining riparian habitat. They also assist in identifying potential hazards, the location of gravel sources, and the proper siting of project facilities, including the appropriate location and types of waterway crossings.

The entirety of the study area is underlain by permafrost anywhere from 250 m to 600 meters (m) thick. This permafrost is responsible for surficial water features such as thaw lakes, high- and low-centered polygons, and reticulate-patterned ground, which covers the area (Kane et al. 2012; Ping et al. 2020). Permafrost in the area creates an impermeable layer, making the drainages hydraulically tight; however, taliks (or perennial unfrozen sections of ground) create pathways for groundwater seepage to the surface, which can lead to aufeis, or the icing of groundwater overflow (Kane et al. 2012).

Rivers and other waterbodies become important highways for local residents and visitors to the area. They provide access to subsistence fishing and hunting areas and access to traditional harvesting areas. For residents and visitors to the area, lakes, rivers, and other waterbodies offer places to hunt, fish, camp, view wildlife, and travel through the area. For polar bears, the river corridors provide important habitat, particularly for denning. Muskox concentration areas are often associated with rivers and riparian areas as well. A variety of waterbird and landbird species are seasonally concentrated along stream corridors, lakes, and wetlands.

In accordance with the NSAP, buffers, easements, and setbacks may be required on navigable and public waters in the project area.

6.5.1 Drainage Basins

The project lies in a hydraulically complex region whose drainage basins encompass 22 individual 10-digit Hydrologic Unit Codes (HUCs) that drain nearly 4.5 million acres (see Table 6-3 and Figure 6-11).

Table 6-3 10-Digit HUCs Located in Project Area

10-Digit HUC	Watershed Name	Watershed Area (acres)
1906040208	Upper Sagavanirktok River	**200,415**
1906040214	Outlet Echooka River	**98,630**
1906040101	Putuligayuk River-Frontal Beaufort Sea	**187,869**
1906040215	Lower Ivishak River	**249,472**
1906040217	Lower Sagavanirktok River-Frontal Beaufort Sea	**516,689**
1906040304	Headwaters Shaviovik River	**129,910**
1906040309	No watershed name	**132,496**
1906040109	Lower Toolik River	**263,534**
1906040216	Middle Sagavanirktok River	**237,696**
1906040307	Outlet Kavik River	**238,341**
1906040111	No watershed name	**92,415**
1906040310	Kadleroshilik River	**251,856**
1906040308	Outlet Shaviovik River	**149,385**
1906040305	Pogopuk Creek	**63,809**
1906040311	Mikkelsen Bay-Frontal Beaufort Sea	**413,390**
1906040303	Juniper Creek	**229,692**
1906040302	No watershed name	**96,141**
1906040301	No watershed name	**59,759**
1906040306	Headwaters Kavik River	**231,153**
1906050109	Middle Canning River	**149,836**
1906050108	Upper Canning River	**200,808**
1906050111	Lower Canning River-Frontal Camden Bay	**303,546**
Total (acres)		**4,496,841**

6.5.2 Lakes

The Arctic Coastal Plain between the Sagavanirktok River and the Canning River is morphologically similar to the area west of Prudhoe Bay to the Kuparuk River. These areas are considered a rolling thaw-lake plain, with nearshore areas known as flat-thaw lake plains (Walker and Acevedo 1987). As such, thaw lakes are common in the project area, particularly to the north toward the coast.

Additionally, most thaw lakes between the Sagavanirktok and Shaviovik rivers appear to have a northwesterly trend, with lakes elongated from northwest to southeast and oriented toward the mouth of the Sagavanirktok River. Thaw lakes to the east of the Shaviovik River have a more angled trajectory to the northeast, where elongated lakes appear oriented more toward the mouth of the Canning River. This pattern is likely due to a time near the Pleistocene epoch when the Colville River may have trended to the east, cutting south of the Franklin Bluffs, then heading north through the same channel as the modern course of the Shaviovik River (Rawlinson 1990).

Most of the lakes between the Sagavanirktok and Canning rivers are, with few exceptions, under 1 mile long. Larger lakes cluster toward the north and west, with the largest lakes being between the Sagavanirktok River channels. To the south of the project area, no large lakes exist, although some lakes do cluster around the southern extent of the Franklin Bluffs. Few studies are known to have taken place on lakes within the study area; however, one exception is the East Badami mine site, which is an inundated gravel source on the west side of East Badami Creek and has been studied for the presence of fish and water quality (Ott et al. 2014).

6.5.3 Rivers and Streams

The open-water hydrologic cycle within the project area is characterized by a short, intense breakup event followed by quickly receding flood levels and a prolonged period of low flows, with small, occasional rain-induced flow events. There is limited ongoing hydrologic data collection for the rivers in this region; two long-term stream gages in the area are located on the Sagavanirktok River near the Dalton highway milepost 324.7 and milepost 347 (USGS 2025; Water and Environmental Research Center [WERC] 2025). Temporary hydrologic stations collected data in the Kadleroshilik, Shaviovik, and the Unnamed River (tributary to the Shaviovik River) from 2009 to 2010 (Kane et al. 2012).

Specific rivers and streams are described below. Assessment of river crossings and hydrology is a key factor in route selection. These rivers and streams were generally selected for discussion because they are either significant rivers in the project study area or because the proposed road routes may cross them or their basins.

Sagavanirktok River: The Sagavanirktok River flows north approximately 180 miles from the Brooks Range into the Beaufort Sea near Prudhoe Bay. The Sagavanirktok River parallels the Dalton Highway and splits into what is referred to as the main channel and the west channel approximately 20 miles south of the Beaufort Sea, where it flows into Prudhoe and Foggy Island Bays. A vehicle bridge associated with the Endicott Road system exists over the west channel of the Sagavanirktok River. In general, the Sagavanirktok is a shallow braided river, free of vegetation, with a riverbed composed of fine sand and gravel.

The Sagavanirktok River has had several recorded flooding events, typically resulting from the buildup of frozen surface water, which diverts thawing river water and additional snowmelt runoff away from their natural channels. Spring flooding in 2025, 2023, 2016, and 2015 has led to the

closure and repair of several sections of the Dalton Highway; additionally, heavy rain in the fall of 2019 caused considerable erosion and flooding (Tessen 2025; Boyce 2023; Ellis 2023; Hasemyer 2021). Annual inundation with occasional flooding events during spring breakup should be assumed.

Kadleroshilik River: The Kadleroshilik River flows north approximately 65 miles from the Arctic Foothills into Foggy Island Bay of the Beaufort Sea. The river can be generally described as a split-channel system with waters that do not usually exceed 6 feet in depth. The river's banks include vegetated cutbanks with large gravel bars composed of uncompacted coarse gravel (Hemming 1996). A temporary hydrological station placed at the Kadleroshilik between 2009 and 2010 suggests water level elevations are at their peak between mid-May and mid-June; reflecting spring breakup and ice-affected levels as temperatures warm.

Because the majority of the Kadleroshilik River lies within the Arctic Coastal Plain, it is less susceptible to rainfall inundation and flooding. The river's peak discharge typically occurs as a result of spring runoff (Kane et al. 2012).

Unnamed River (Tributary to Shaviovik River): Single channel meandering beaded stream that flows into the mouth of the Shaviovik River.

Shaviovik River: The Shaviovik River flows north approximately 75 miles from the foothills of the Brooks Range to the Beaufort Sea between Mikkelsen Bay and Foggy Island Bay. Contributing creeks in the Brooks Range foothills include the approximately 60-mile-long Juniper Creek, which flows into the Shaviovik River roughly 40 miles south of its delta. Additionally, Fin Creek and Kemik Creek flow into Juniper Creek and the Shaviovik River, respectively, from the Brooks Range foothills. In general, the Shaviovik is a braided river with several vegetated terraces and vast gravel bars (Hemming 1996).

A temporary hydrological station installed on the Shaviovik River from 2009 to 2010 suggests water level elevations were at their peak again between mid-May and mid-June during spring breakup. However, the Shaviovik River levels also showed periodic increases during heavy rainfall events between late July and mid-August (Kane et al. 2012).

Like the Sagavanirktok River, the Shaviovik River's headwaters originate in the Brooks Range and are more susceptible to seasonal rainfall originating in the Arctic Coastal Plain, the Arctic Foothills, and the Brooks Range foothills. Inundation with occasional flooding events during spring breakup should be assumed.

Kavik River: The Kavik River flows generally northwest approximately 80 miles from the Brooks Range and joins the Shaviovik River approximately 10 miles from its delta, which flows into both Foggy Island Bay and Mikkelsen Bay approximately 28 miles southwest of Flaxman Island. The Kavik River's water level fluctuations are not well studied throughout the year; however, because it flows into the Shaviovik River, it likely exhibits similar characteristics and is prone to seasonal flooding in the spring and to elevated flows during heavy rainfall events originating in the Brooks Range.

Unnamed River (east of Shaviovik River): This unnamed river, located 1.5 miles east of the Shaviovik River, flows approximately 42 miles northwest from the eastern central portion of the study area in the Arctic Foothills into Mikkelsen Bay of the Beaufort Sea. The single-channel stream is characterized by many gravel bars and vegetated terraces. Near its mouth, the channel can be up to 330 feet wide and remain under 6.5 feet deep (Hemming 1996).

From river discharge measurements taken in 2009–2010, it appeared that this unnamed river had its highest levels in early June, followed by little flow during the summer months until mid-August to early September rain events elevated water levels (Kane et al. 2012).

East Badami Creek: The East Badami Creek flows northwest for approximately 20 miles from the eastern central portion of the study area in the Arctic Foothills to the east side of Mikkelsen Bay in the Beaufort Sea. East Badami Creek is a single-channel stream with vegetated cutbanks that do not exceed 6 feet in height and a gravel streambed that does not exceed 6 feet in depth (Hemming 1996). This creek does not originate as far within the Brooks Range as other waterways in the project area; however, similar to other rivers and creeks, East Badami Creek is likely to experience seasonal flooding in the spring.

6.5.4 Springs and Aufeis Fields

Springs generally occur within or adjacent to braided streams, exhibiting multiple channels that are distinct from the nearby river channels (Koch et al. 2024). During the winter, these springs can be identified by open water, and in the summer, vibrant green patches on hillsides and along riverbanks may indicate their presence. A series of 13 known fresh to slightly mineralized springs (e.g., Lupine Springs, Flood Creek Springs, Ivishak Hillside Springs, Echooka East) are located along the northern flanks of the Brooks Range (Childers et al. 1973). Most are just outside the project area within ANWR; however, two fall along the southern project area boundary (Figure 6-11).

Aufeis forms in areas underlain by permafrost when groundwater flows beneath the ground surface and becomes restricted by frozen soils during winter. As hydraulic pressure builds, water is forced to the surface where it freezes in successive layers on frozen ground. The source of the water is generally rivers, supra-permafrost groundwater, or springs, and the resulting ice fields may extend across adjacent floodplains (Dann et al. 2025).

Aufeis is typically constrained to floodplains and generally recurs seasonally in the same locations. Aufeis fields are commonly classified into four categories: persistent, regular, ephemeral, and uncommon (Koch et al. 2024). Persistent aufeis occurs at the same location every year into late summer. Regular fields occur near persistent fields but do not extend beyond the thaw season or vary in their persistence. Ephemeral fields occur at the margins of major aufeis fields and disappear by late spring. Uncommon fields have limited occurrences throughout each spring and are not consistent (Koch et al. 2024).

Aside from the Sagavanirktok and Canning rivers, many of the waterways within the project area have not been heavily studied for aufeis. However, Wohl and Scamardo (2022) identified an instance of aufeis on the Kavik River approximately 15 miles east of the confluence of the Shaviovik River and Juniper Creek. Aerial imagery from March 2021 shows an apparent large aufeis accumulation on the Echooka River just outside the ANWR border and smaller aufeis accumulations on the upper reaches of the Ivishak River and Flood Creek near the confluence with the Saviukviayak River. Additionally, seven locations of aufeis have been identified on the Canning River, all north of the aufeis on the Kavik River (Wohl and Scamardo 2022).

6.6 National Wetlands Inventory Wetlands Mapping with HUCS

Fill placed in jurisdictional wetlands and waters of the United States would require a U.S. Army Corps of Engineers (USACE) permit under Section 404 of the Clean Water Act (CWA). Any fill or work in, over, or under a traditional navigable water, including the territorial sea, would also require authorization under Section 10 of the Rivers and Harbors Act.

The extent of wetlands and waters of the United States within the study area and the corridors analyzed was based on the USFWS National Wetlands Inventory (NWI) mapping (USFWS 2025b) (Figure 6-12). The study area was evaluated using the *Alaska District Compensatory Mitigation Thought Process* (Thought Process) (USACE 2025) to assess the most beneficial corridor locations in the study area with respect to CWA Section 404 permitting. Impacts requiring only a Section 10 authorization do not typically require compensatory mitigation. The USACE utilizes the Thought Process as an objective and defensible method to determine if compensatory mitigation may be necessary.

By evaluating the wetland habitats in the study area against the requirements of the Thought Process, it is possible to estimate portions of the study area that would be more favorable and less costly to permit with respect to compensatory mitigation.

The first step in the Thought Process is to identify the watershed and watershed scale that is most appropriate for the project with respect to existing development and overall project impacts. USGS 10-Digit Hydrologic Unit Codes (HUCs) were selected because the study area does not represent an area with elevated development activity, which conforms to USACE Thought Process evaluation criteria. The acres of wetlands and uplands within each USGS 10-digit HUC were calculated using NWI mapping and aerial image interpretation.

Natural uplands and disturbed uplands were separated to identify which HUCs contain anthropogenic disturbance. Anthropogenic disturbance is an important parameter used to determine whether a watershed is considered disturbed under the Thought Process.

Table 6-4 shows the total wetlands and uplands mapped within the 22 10-digit HUC watersheds potentially impacted by the study area.

Table 6-4 Total Project Area Wetlands/Uplands (acres) per 10-Digit HUC

USGS 10-Digit HUC Name	Estuarine and Marine Wetland	Other WOUS (Streams/Lakes/ Ponds)	Palustrine Wetland	Upland	Total
1906040101	0	0	5	0	**5**
1906040109	0	5	3,294	349	**3,647**
1906040111	0	131	2,569	4	**2,704**
1906040208	0	606	849	36	**1,491**
1906040214	0	8,262	77,111	5,551	**90,925**
1906040215	0	13,598	166,544	10,014	**190,155**
1906040216	0	25,787	110,255	5,028	**141,070**
1906040217	9,133	38,185	244,843	1,894	**294,054**
1906040301	3	2,794	56,855	60	**59,711**
1906040302	83	3,522	92,271	188	**96,065**
1906040303	0	3,826	119,431	10,646	**133,903**
1906040304	0	1,641	96,253	8,594	**106,488**
1906040305	0	193	6,720	5,603	**12,516**
1906040306	0	4,529	183,523	15,107	**203,159**
1906040307	0	6,714	230,240	1,196	**238,151**
1906040308	4	17,741	130,792	730	**149,267**
1906040309	0	4,387	127,347	664	**132,398**
1906040310	50	12,094	238,126	1,391	**251,662**
1906040311	4,288	12,113	184,360	202	**200,963**
1906050108	0	344	26,694	16,373	**43,411**
1906050109	0	743	42,761	1,251	**44,755**
1906050111	363	1,017	44,579	22	**45,981**
Totals	**13,924**	**158,232**	**2,185,422**	**84,903**	**2,442,484**

Notes:

1. Totals may not add up due to rounding
2. Unmapped portions of the watershed are not included in totals. These would need to be mapped to obtain accurate watershed disturbance levels.

Key: HUC = Hydrologic Unit Code; WOUS = Waters of the United States

6.7 Physiography

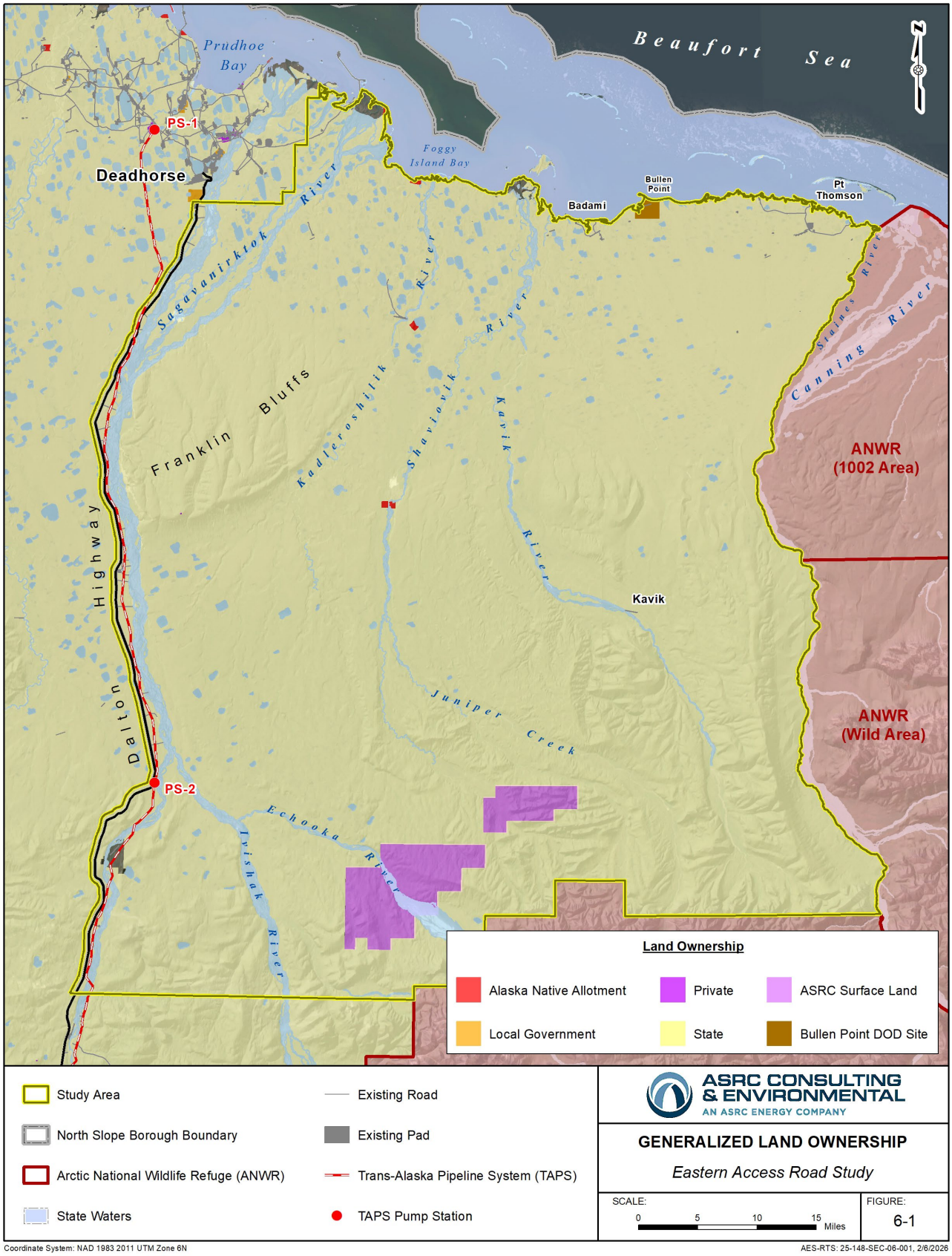
The North Slope of Alaska is dominated by tundra vegetation consisting of mosses, sedges, and dwarf shrubs. The entire area is underlain by thick, continuous permafrost, which is ground that remains at or below 32 degrees Fahrenheit (°F) for at least two consecutive years. Permafrost-related landforms include pingos and ice-wedge polygons. In flat areas nearer to the coast, the tundra surface contains many lakes, ponds, and braided streams. The coastline is irregular and contains many bays, lagoons, and barrier islands. Major rivers on the eastern North Slope include the Sagavanirktok, Kadleroshilik, Shaviovik, Canning, Porcupine, Ivishak, Sheenjek, and Wind rivers.

6.7.1 Physiographic Provinces

As shown in Figure 6-13, the project area extends across two physiographic provinces: the Arctic Foothills and the Arctic Coastal Plain (Wahrhaftig 1960).

The Arctic Coastal Plain rises from the Arctic Ocean coastline to a maximum elevation of 600 feet. The plain is poorly drained and is crossed by rivers fed by highlands to the south and draining northwards to the Beaufort Sea. Rivers east of the Colville cross the plain in braided channels with large alluvial fans, with deltas extending into the Arctic Ocean. Abundant thaw lakes are present along the coast between major drainage features. The entire plain is underlain by permafrost at least 1,000 feet thick. The permafrost table (base of seasonal thaw, or active layer) is generally 0.5 to 4 feet below the surface.

The Arctic Foothills province consists of northward-sloping foothills just north of the Brooks Range, with low east–west-trending ridges, rolling plateaus, and irregular isolated hills. The foothills rise from some 600 feet in the north to 3,600 feet in the south. The southern section is 1,200 to 3,500 feet in elevation, with local relief as much as 2,500 feet, and is characterized by buttes, knobs, mesas, and east-trending ridges with intervening gently undulating tundra plains. The Arctic Foothills are crossed by north-flowing rivers from sources in the Brooks Range. Most streams have swift, braided courses across broad gravel flats that are locally covered with aufeis in winter (Wahrhaftig 1960). A few thaw lakes are present in river valleys and on some divides. There are no glaciers. The entire area is underlain by permafrost with ice-wedges, stone stripes, polygonal ground, and other features.


Beaufort Sea
Prudhoe Bay
Foggy Island Bay
PS-1
Deadhorse
Sagavanirktok River
Badami
Bullen Point
Pt Thomson
Staines River
Canning River
Franklin Bluffs
Kadleroshilik River
Shaviovik River
Kavik River
ANWR (1002 Area)
Dalton Highway
Kavik
ANWR (Wild Area)
Juniper Creek
PS-2
Echooka River
Ivishak River
Land Ownership
Alaska Native Allotment
Private
ASRC Surface Land
Local Government
State
Bullen Point DOD Site
Study Area
Existing Road
North Slope Borough Boundary
Existing Pad
Arctic National Wildlife Refuge (ANWR)
Trans-Alaska Pipeline System (TAPS)
State Waters
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
GENERALIZED LAND OWNERSHIP
Eastern Access Road Study
SCALE:
0 5 10 15 Miles
FIGURE:
6-1
Coordinate System: NAD 1983 2011 UTM Zone 6N
AES-RTS: 25-148-SEC-06-001, 2/6/2026

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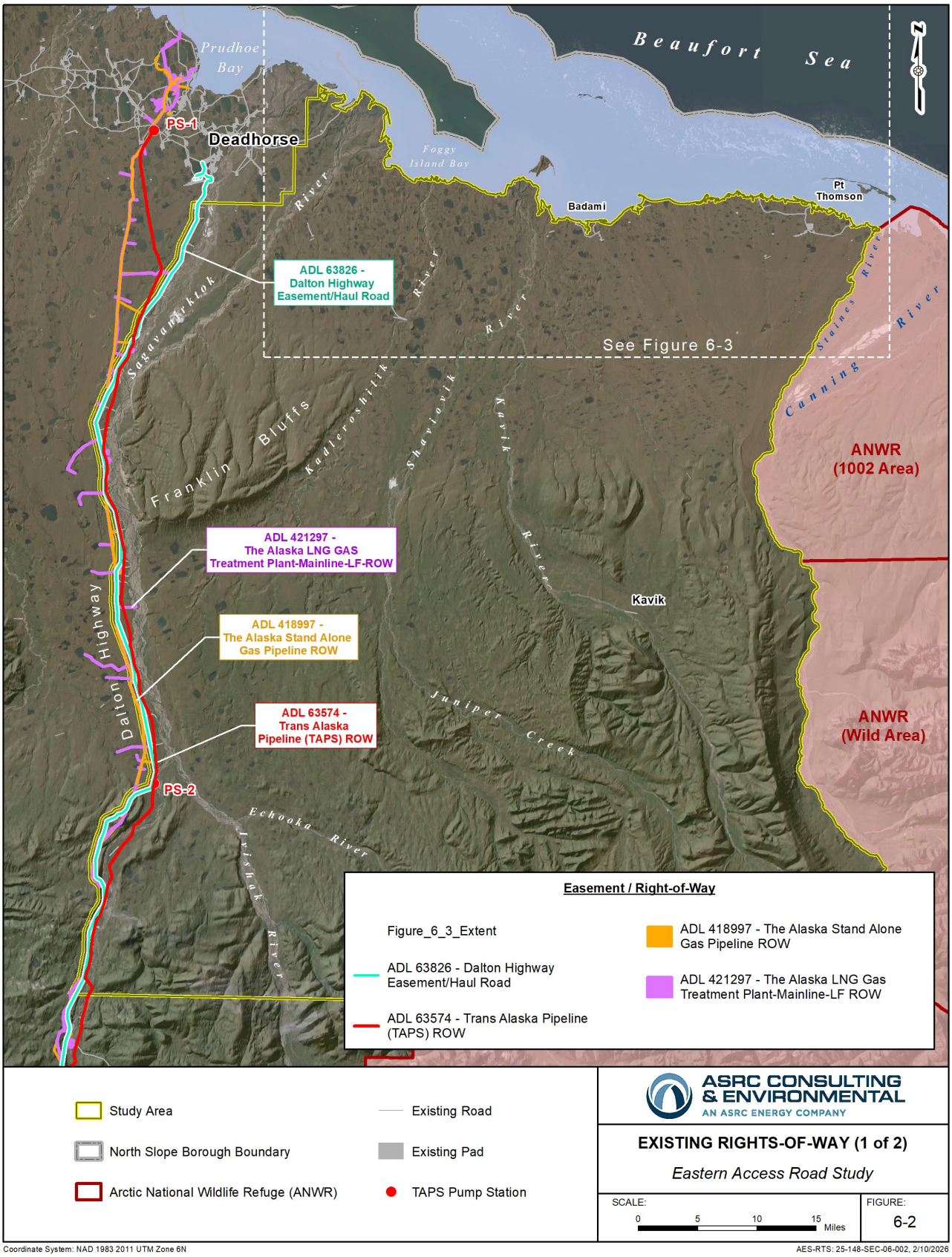
Beaufort Sea
Prudhoe Bay
PS-1
Deadhorse
Foggy Island Bay
Badami
Pt Thomson
ADL 63826 - Dalton Highway Easement/Haul Road
See Figure 6-3
Sagavanirktok River
Kadleroshilik River
Shaviovik River
Kavik River
Staines River
Canning River
Franklin Bluffs
ANWR (1002 Area)
ADL 421297 - The Alaska LNG GAS Treatment Plant-Mainline-LF-ROW
Dalton Highway
ADL 418997 - The Alaska Stand Alone Gas Pipeline ROW
Kavik
ADL 63574 - Trans Alaska Pipeline (TAPS) ROW
Juniper Creek
ANWR (Wild Area)
PS-2
Echooka River
Ivishak River
Easement / Right-of-Way
Figure_6_3_Extent
ADL 63826 - Dalton Highway Easement/Haul Road
ADL 63574 - Trans Alaska Pipeline (TAPS) ROW
ADL 418997 - The Alaska Stand Alone Gas Pipeline ROW
ADL 421297 - The Alaska LNG Gas Treatment Plant-Mainline-LF ROW
Study Area
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
Existing Road
Existing Pad
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
EXISTING RIGHTS-OF-WAY (1 of 2)
Eastern Access Road Study
SCALE:
0 5 10 15 Miles
FIGURE:
6-2
Coordinate System: NAD 1983 2011 UTM Zone 6N
AES-RTS: 25-148-SEC-06-002, 2/10/2026

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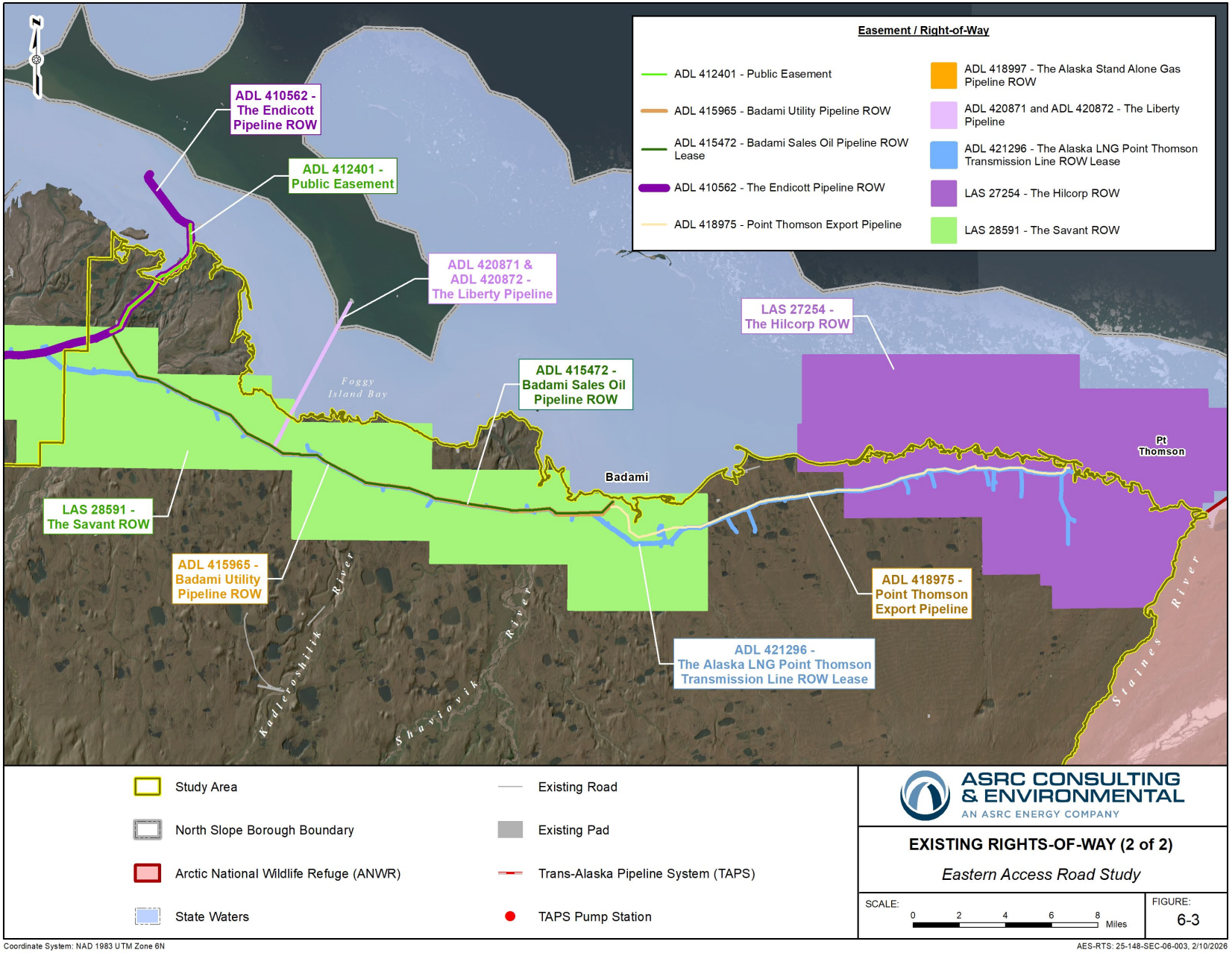
Easement / Right-of-Way
ADL 412401 - Public Easement
ADL 415965 - Badami Utility Pipeline ROW
ADL 415472 - Badami Sales Oil Pipeline ROW Lease
ADL 410562 - The Endicott Pipeline ROW
ADL 418975 - Point Thomson Export Pipeline
ADL 418997 - The Alaska Stand Alone Gas Pipeline ROW
ADL 420871 and ADL 420872 - The Liberty Pipeline
ADL 421296 - The Alaska LNG Point Thomson Transmission Line ROW Lease
LAS 27254 - The Hilcorp ROW
LAS 28591 - The Savant ROW
ADL 410562 - The Endicott Pipeline ROW
ADL 412401 - Public Easement
ADL 420871 & ADL 420872 - The Liberty Pipeline
ADL 415472 - Badami Sales Oil Pipeline ROW
LAS 27254 - The Hilcorp ROW
LAS 28591 - The Savant ROW
ADL 415965 - Badami Utility Pipeline ROW
ADL 418975 - Point Thomson Export Pipeline
ADL 421296 - The Alaska LNG Point Thomson Transmission Line ROW Lease
Foggy Island Bay
Badami
Pt Thomson
Kadleroshilik River
Shaviovik River
Staines River
Study Area
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
State Waters
Existing Road
Existing Pad
Trans-Alaska Pipeline System (TAPS)
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
EXISTING RIGHTS-OF-WAY (2 of 2)
Eastern Access Road Study
SCALE: 0 2 4 6 8 Miles
FIGURE: 6-3
Coordinate System: NAD 1983 UTM Zone 6N
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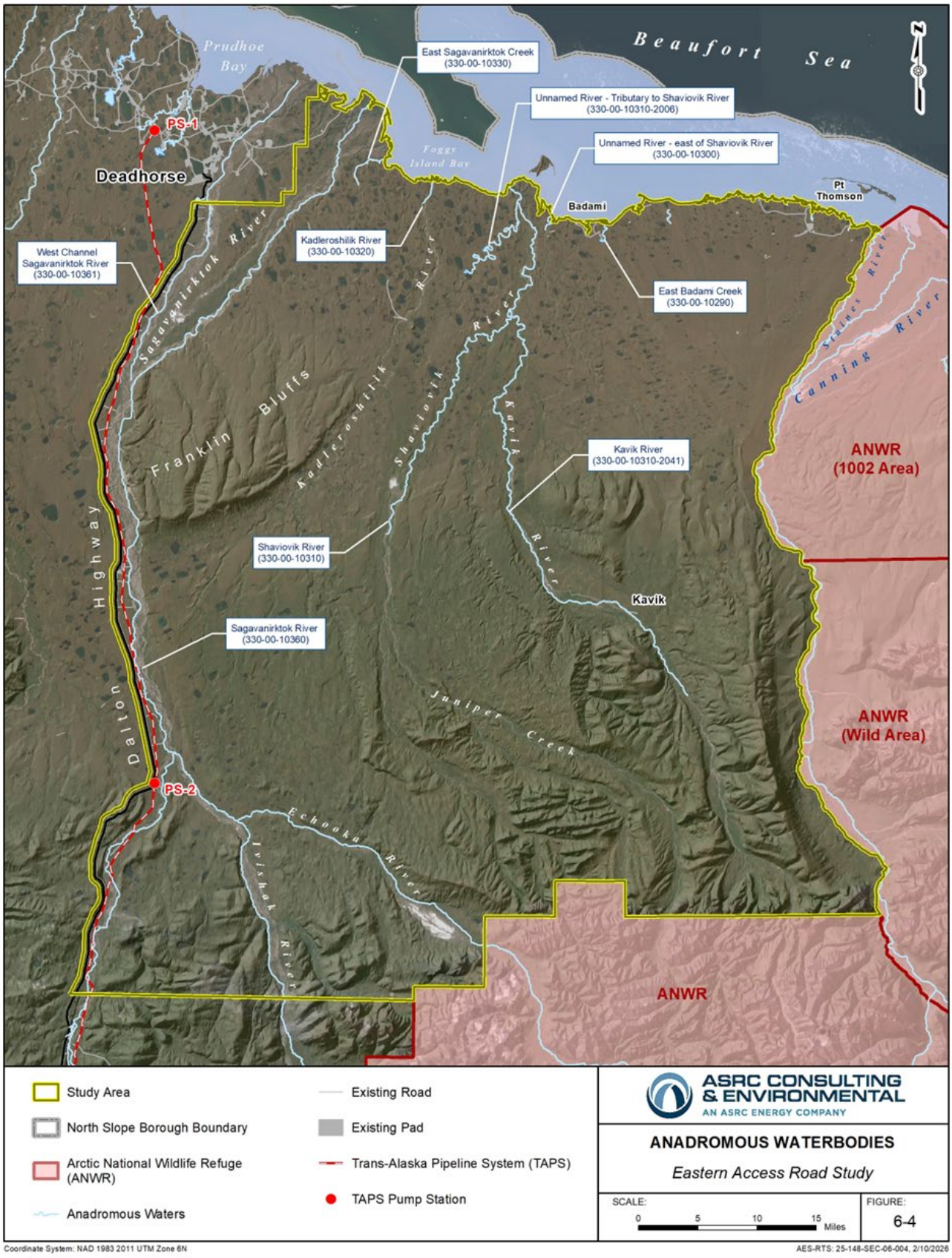
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Prudhoe Bay
Foggy Island Bay
East Sagavanirktok Creek (330-00-10330)
Unnamed River - Tributary to Shaviovik River (330-00-10310-2006)
Unnamed River - east of Shaviovik River (330-00-10300)
PS-1
Deadhorse
Badami
Pt Thomson
West Channel Sagavanirktok River (330-00-10361)
Kadleroshilik River (330-00-10320)
East Badami Creek (330-00-10290)
Sagavanirktok River
Franklin Bluffs
Kadleroshilik River
Shaviovik River
Kavik River
Staines River
Canning River
ANWR (1002 Area)
Kavik River (330-00-10310-2041)
Shaviovik River (330-00-10310)
Kavik
Sagavanirktok River (330-00-10360)
Dalton Highway
Juniper Creek
ANWR (Wild Area)
PS-2
Echooka River
Ivishak River
ANWR
Study Area
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
Anadromous Waters
Existing Road
Existing Pad
Trans-Alaska Pipeline System (TAPS)
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
ANADROMOUS WATERBODIES
Eastern Access Road Study
SCALE:
0 5 10 15 Miles
FIGURE:
6-4
Coordinate System: NAD 1983 2011 UTM Zone 6N
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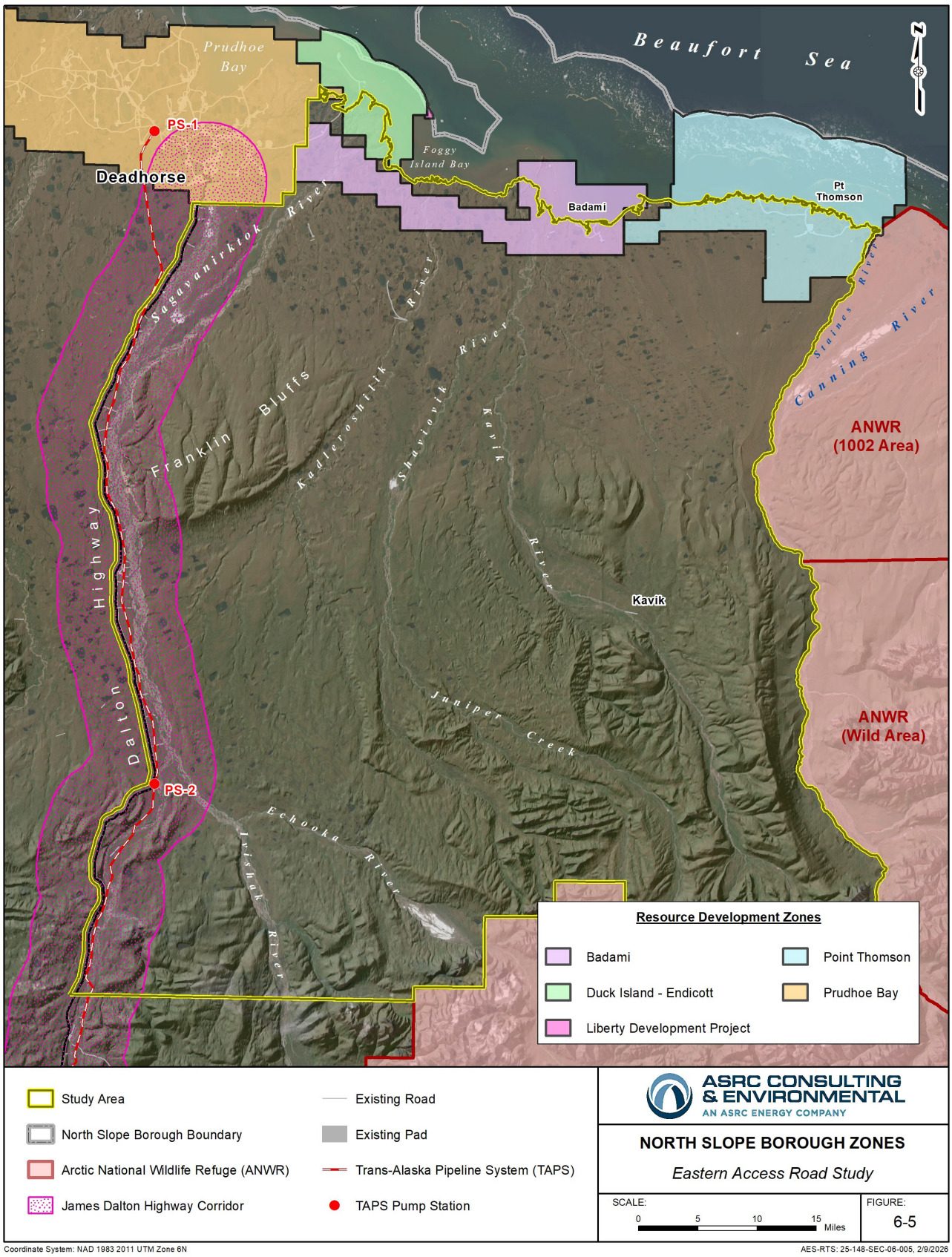
Beaufort Sea
Prudhoe Bay
PS-1
Deadhorse
Foggy Island Bay
Badami
Pt Thomson
Sagavanirktok River
Franklin Bluffs
Kadleroshilik River
Shaviovik River
Kavik River
Staines River
Canning River
ANWR (1002 Area)
Dalton Highway
Kavik
Juniper Creek
ANWR (Wild Area)
PS-2
Echooka River
Iwishak River
Resource Development Zones
Badami
Point Thomson
Duck Island - Endicott
Prudhoe Bay
Liberty Development Project
Study Area
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
James Dalton Highway Corridor
Existing Road
Existing Pad
Trans-Alaska Pipeline System (TAPS)
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
NORTH SLOPE BOROUGH ZONES
Eastern Access Road Study
SCALE:
0 5 10 15 Miles
FIGURE:
6-5
Coordinate System: NAD 1983 2011 UTM Zone 6N
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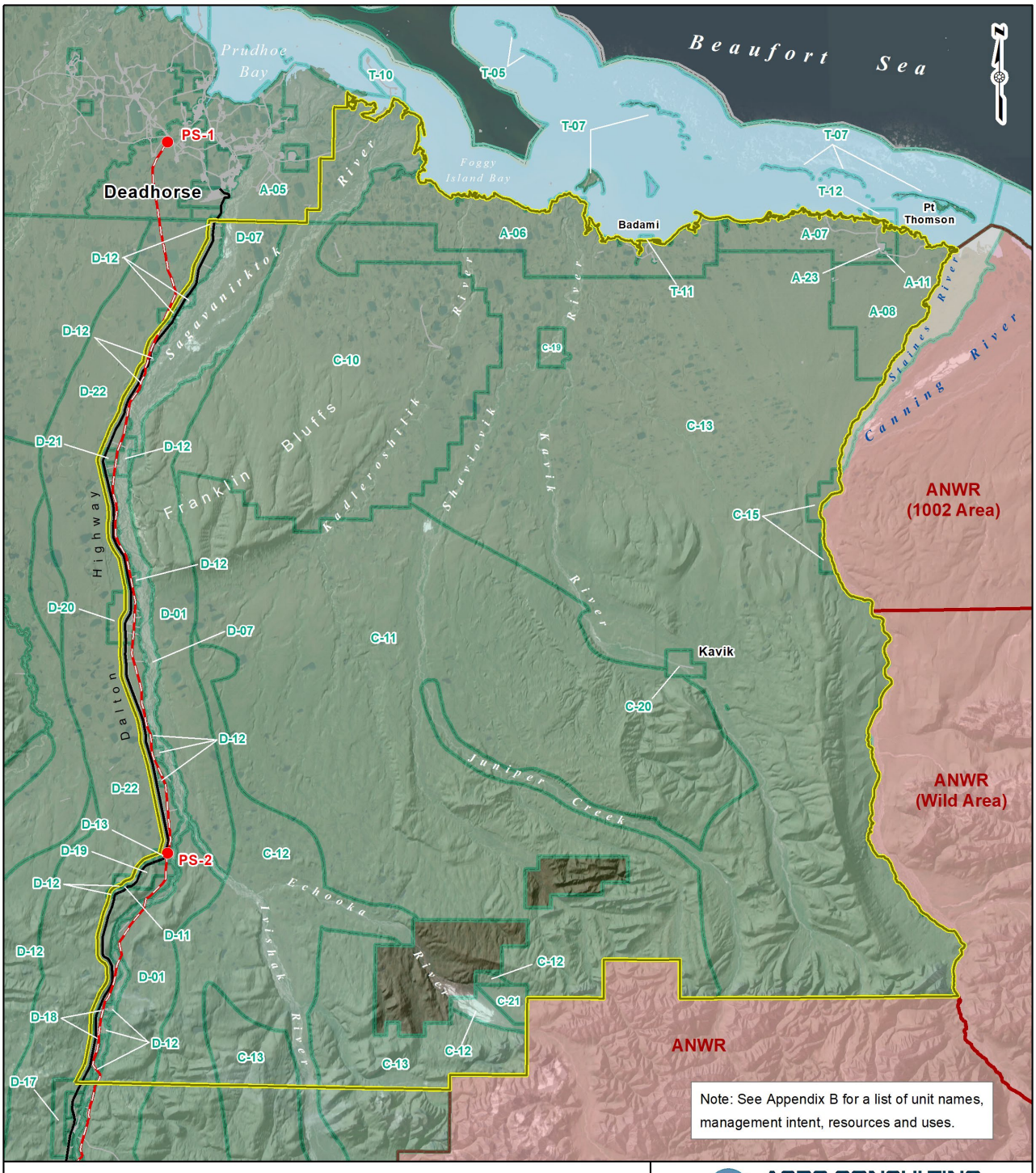
Beaufort Sea
Prudhoe Bay
Foggy Island Bay
PS-1
Deadhorse
PS-2
Badami
Pt Thomson
Kavik
ANWR (1002 Area)
ANWR (Wild Area)
ANWR
Note: See Appendix B for a list of unit names, management intent, resources and uses.
Study Area
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
North Slope Area Plan Units
Existing Road
Existing Pad
Trans-Alaska Pipeline System (TAPS)
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
NORTH SLOPE AREA PLAN UNITS
Eastern Access Road Study
SCALE:
0 5 10 15 Miles
FIGURE:
6-6
Coordinate System: NAD 1983 2011 UTM Zone 6N
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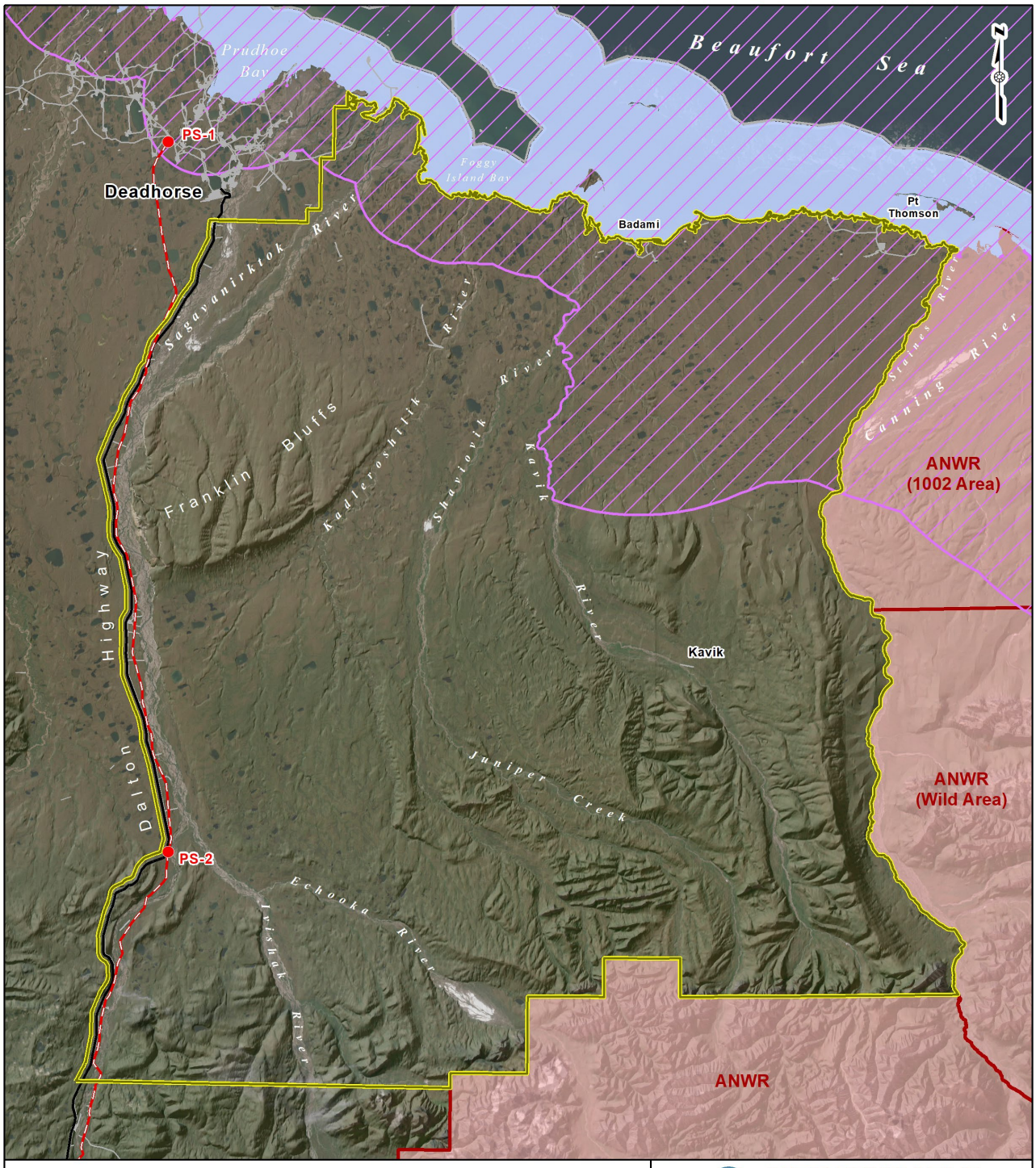
Beaufort Sea
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Foggy Island Bay
PS-1
Deadhorse
Badami
Pt Thomson
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Franklin Bluffs
Kadleroshtilik River
Shaviovik River
Kavik River
Staines River
Canning River
ANWR (1002 Area)
Dalton Highway
Kavik
Juniper Creek
ANWR (Wild Area)
PS-2
Echooka River
Ivishak River
ANWR
Study Area
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
Polar Bear Critical Habitat
Existing Road
Existing Pad
Trans-Alaska Pipeline System (TAPS)
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
POLAR BEAR CRITICAL HABITAT
Eastern Access Road Study
SCALE:
0 5 10 15 Miles
FIGURE:
6-7
Coordinate System: NAD 1983 2011 UTM Zone 6N
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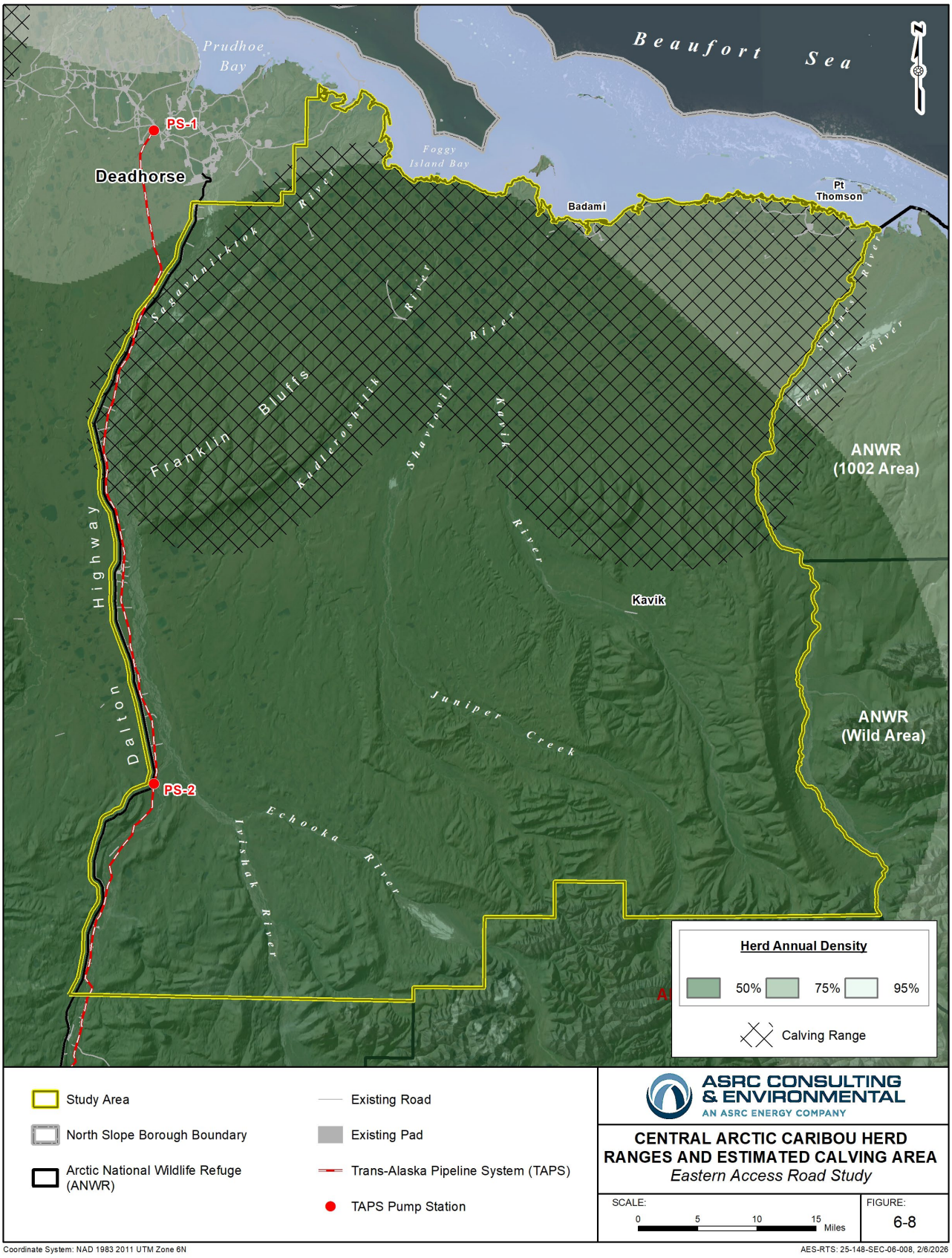
Beaufort Sea
Prudhoe Bay
Foggy Island Bay
PS-1
Deadhorse
Badami
Pt Thomson
Sagavanirktok River
Franklin Bluffs
Kadleroshilik River
Shaviovik River
Kavik River
Staines River
Canning River
ANWR (1002 Area)
Dalton Highway
Kavik
Juniper Creek
ANWR (Wild Area)
PS-2
Echooka River
Ivishak River
Herd Annual Density
50%
75%
95%
Calving Range
Study Area
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
Existing Road
Existing Pad
Trans-Alaska Pipeline System (TAPS)
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
CENTRAL ARCTIC CARIBOU HERD RANGES AND ESTIMATED CALVING AREA
Eastern Access Road Study
SCALE:
0 5 10 15 Miles
FIGURE:
6-8
Coordinate System: NAD 1983 2011 UTM Zone 6N
AES-RTS: 25-148-SEC-06-008, 2/6/2026

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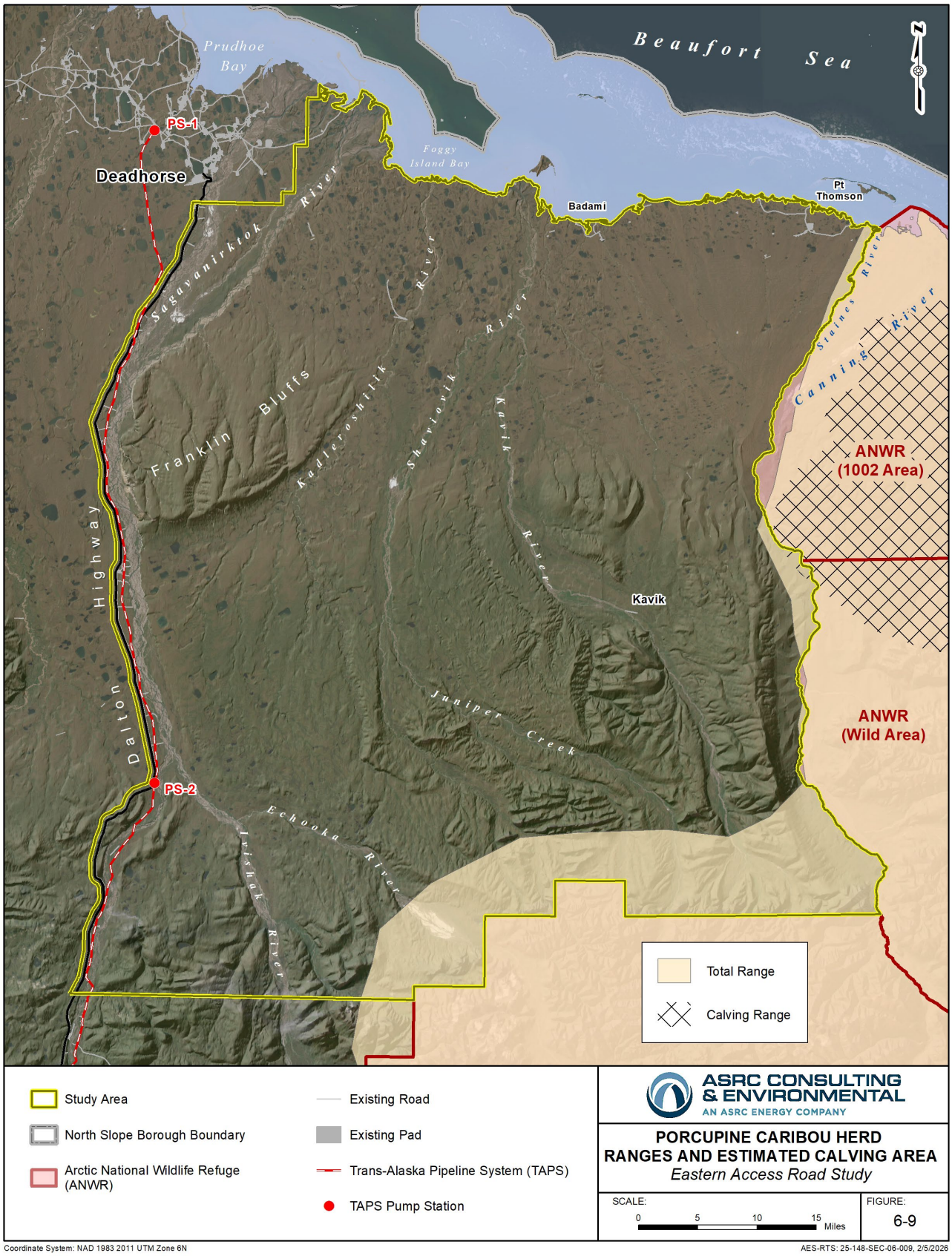
Beaufort Sea
Prudhoe Bay
Foggy Island Bay
PS-1
Deadhorse
Badami
Pt Thomson
Sagavanirktok River
Franklin Bluffs
Kadleroshilik River
Shaviovik River
Kavik River
Canning River
Staines River
ANWR (1002 Area)
ANWR (Wild Area)
Kavik
Dalton Highway
Juniper Creek
PS-2
Echooka River
Ivishak River
Total Range
Calving Range
Study Area
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
Existing Road
Existing Pad
Trans-Alaska Pipeline System (TAPS)
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
PORCUPINE CARIBOU HERD RANGES AND ESTIMATED CALVING AREA
Eastern Access Road Study
SCALE:
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6-9
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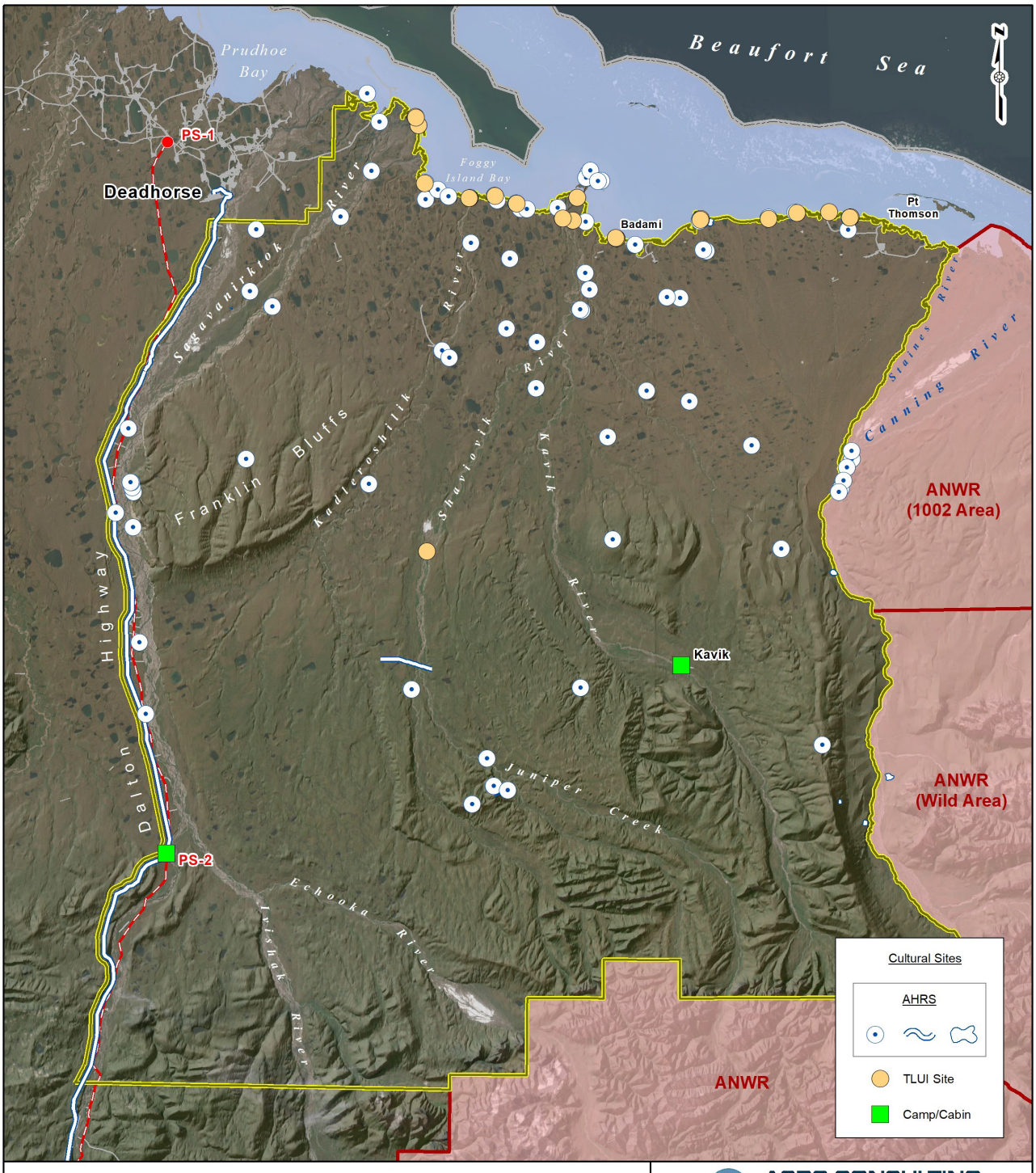
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Shaviovik River
Kavik River
Staines River
Canning River
ANWR (1002 Area)
ANWR (Wild Area)
ANWR
Kavik
Juniper Creek
Dalton Highway
PS-2
Echooka River
Ivishak River
Cultural Sites
AHRS
TLUI Site
Camp/Cabin
Study Area
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
Existing Road
Existing Pad
Trans-Alaska Pipeline System (TAPS)
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
CULTURAL AND PALEONTOLOGICAL RESOURCES
Eastern Access Road Study
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Coordinate System: NAD 1983 2011 UTM Zone 6N
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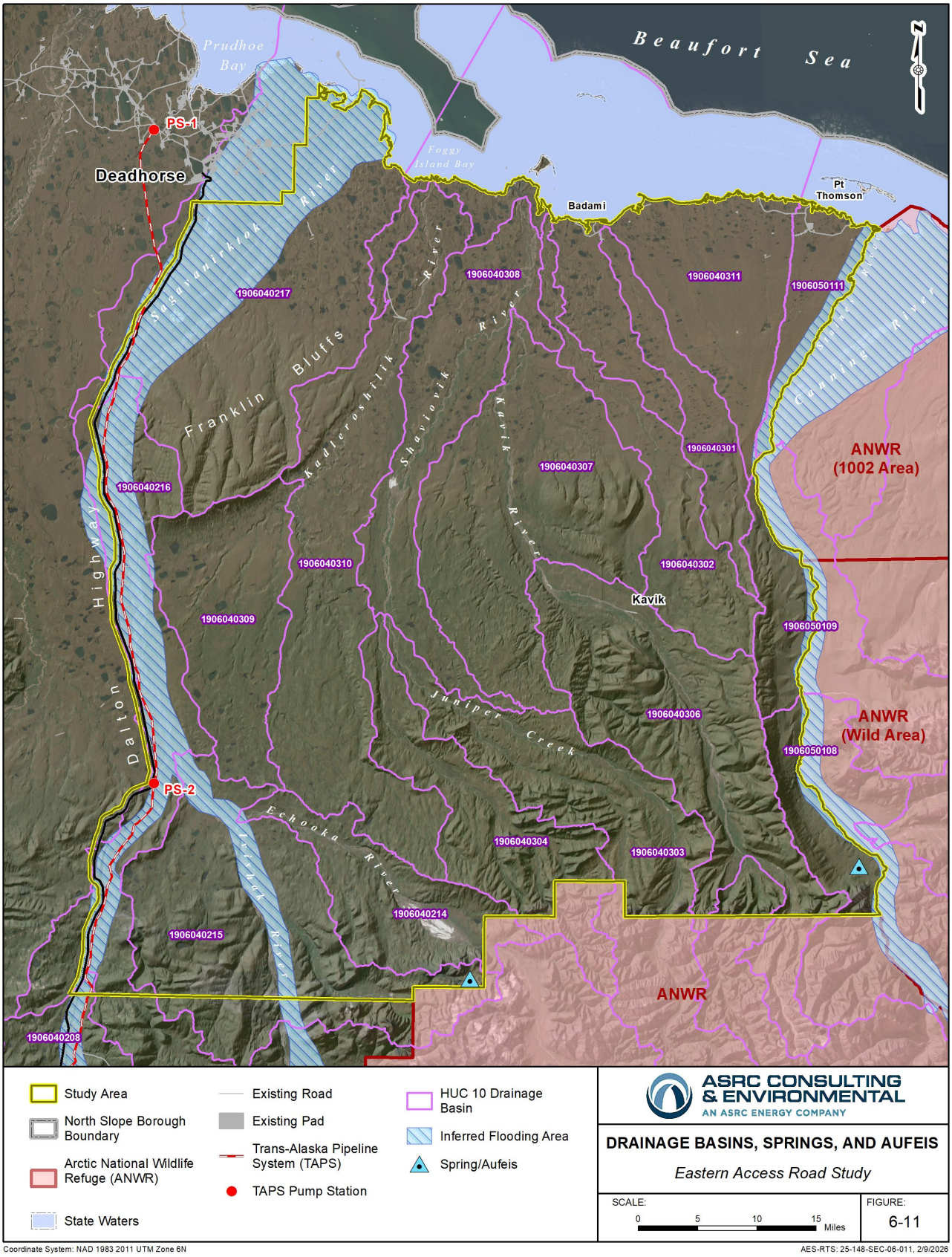
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ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
DRAINAGE BASINS, SPRINGS, AND AUFEIS
Eastern Access Road Study
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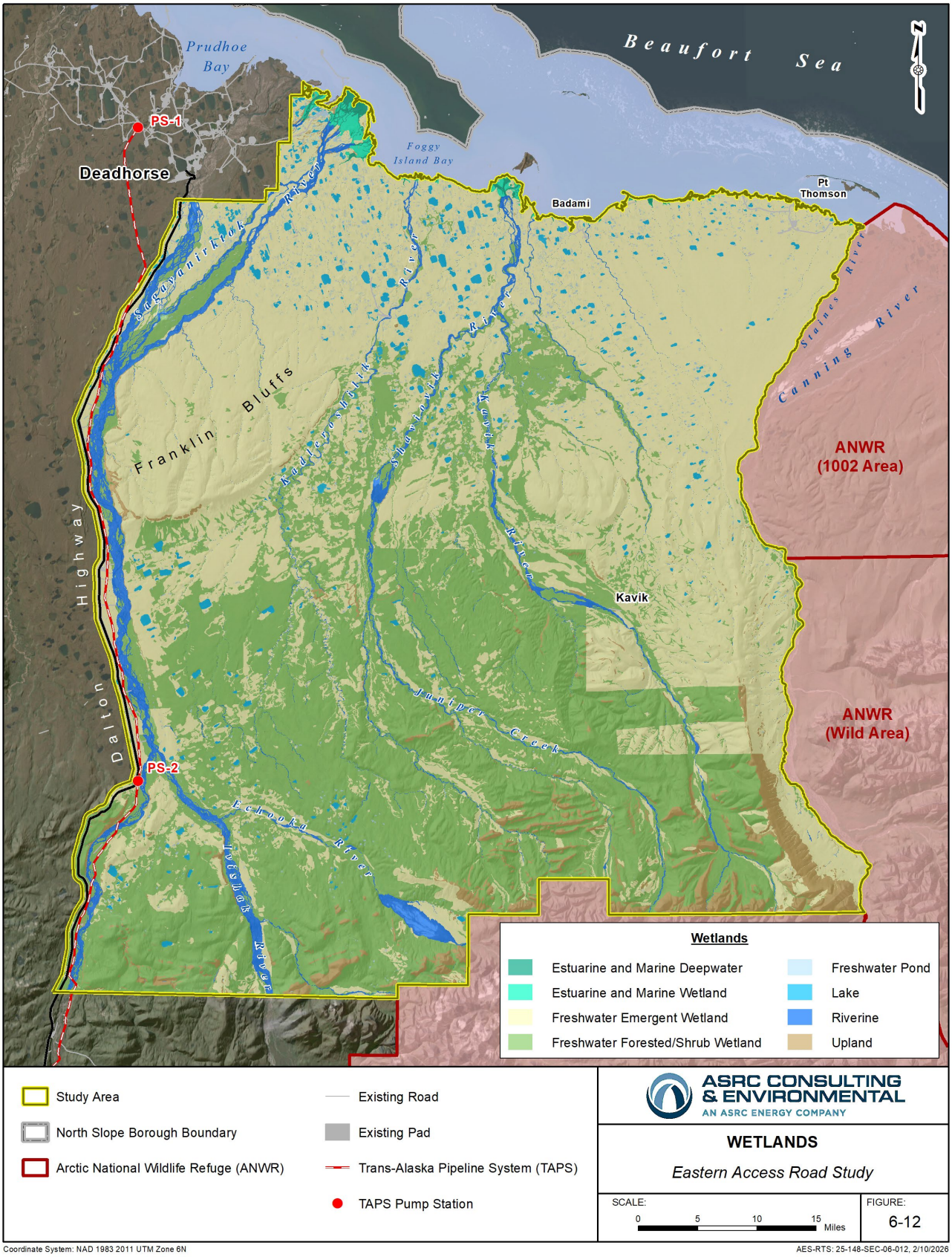
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Franklin Bluffs
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Shoviklik River
Okpilak River
Staines River
Canning River
ANWR (1002 Area)
ANWR (Wild Area)
Kavik
Dalton Highway
Juniper Creek
PS-2
Echooka River
Ivishak River
Wetlands
Estuarine and Marine Deepwater
Estuarine and Marine Wetland
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Riverine
Upland
Study Area
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
Existing Road
Existing Pad
Trans-Alaska Pipeline System (TAPS)
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
WETLANDS
Eastern Access Road Study
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Coordinate System: NAD 1983 2011 UTM Zone 6N
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Beaufort Sea
Prudhoe Bay
Foggy Island Bay
PS-1
Deadhorse
Badami
Pt Thomson
Sagavanirktok River
Franklin Bluffs
Kadleroshilik River
Shaviovik River
Kavik River
Staines River
Canning River
Arctic Coastal Plain
ANWR (1002 Area)
Dalton Highway
Kavik
Juniper Creek
ANWR (Wild Area)
PS-2
Arctic Foothills
Echooka River
Ivishak River
ANWR
Study Area
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
Existing Road
Existing Pad
Trans-Alaska Pipeline System (TAPS)
TAPS Pump Station
Physiographic Unit
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
PHYSIOGRAPHIC PROVINCES
Eastern Access Road Study
SCALE:
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6-13
Coordinate System: NAD 1983 2011 UTM Zone 6N
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7.0 ROUTE IDENTIFICATION AND PRELIMINARY SCREENING

The objective of this study is to identify alternative alignments for a gravel road that would link the contiguous Alaska road system to the vicinity of known and potential O&G reserves on the eastern North Slope, thereby encouraging O&G development in the region through shared infrastructure.

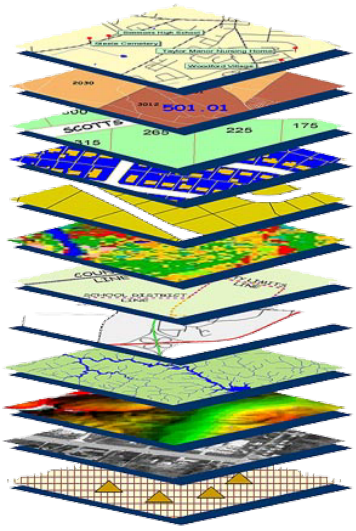
Numerous criteria and constraints affect the routing of the proposed road. Preferred routes are often based on a balance of cost, engineering, environmental, and sociocultural factors. To identify and assess the most advantageous route alignments, an analysis of available spatial (GIS) and non-spatial data must be conducted to identify potential route limitations and issues.

For this study, route alignment prioritizes O&G development and considers connections with existing transportation infrastructure, while (1) protecting fish, wildlife, and sensitive areas and the role they play in subsistence and cultural use and (2) considering the objectives of the NSAP outlined in Section 5.3.

7.1 Route Identification Methodology

Route alternatives for this study were developed using the following steps:

1. Inventory O&G resources within the study area.
2. Consider previously identified routes.
3. Identify potential river crossing locations.
4. Identify environmental, cultural, and land constraints and opportunities.
5. Establish preliminary route centerlines.
6. Consider strengths and weaknesses.
7. Review and refine preliminary routes.



Graphic Overlay Concept

Information obtained during this process was compiled into a GIS database for the purpose of mapping routes based on constraints and opportunities. Spatial information within the database allows data to be viewed both individually and collectively to aid in identifying advantageous and feasible route options. This approach is based on a graphic overlay process introduced by McHarg (1969).

7.2 Route Alternatives

Based on the information available, ACES has developed four new potential routes for evaluation (Figure 7-1). These routes are aligned to provide access to known and potential O&G reserves, while

taking into consideration previously identified routes and new information that has been disclosed since previous studies were completed. Significant O&G deposits or discoveries in the area include Liberty, Mikkelsen, Badami, King Street, Sockeye, Point Thomson, Sourdough, Yukon Gold, Kuvlum, Taktuk/Sivulliq, Grey Owl, Kavik, and Kemik, as well as potential oil deposits in the 1002 Area of ANWR. Except for the Kavik and Kemik natural gas pools, these deposits are on the Arctic Coastal Plain or offshore. The routes are identified as:

- **Route A** (Endicott to Point Thomson, most northernly coastal alternative)
- **Route B** (Endicott to Point Thomson, middle coastal alternative)
- **Route C** (Deadhorse to Point Thomson, southerly coastal alternative)
- **Loop Route** (Dalton Highway to Point Thomson)

7.2.1 Route A (Endicott to Point Thomson, most Northerly Coastal Alternative)

Route A begins at Endicott Road and generally follows the same alignment as CH2M Hill's Coastal Corridor C-2 for the first 14 miles, crossing the Endicott pipeline and the main channel of the Sagavanirktok River and the Kadleroshilik River (Figure 7-1). After crossing the Kadleroshilik River, the route turns more southeasterly toward the vicinity of the King Street 1 exploration well, then easterly to cross the Shaviovik River, then northeasterly toward the Badami and Sockeye pools, and continues on to connect with the existing road system at Point Thomson just north of the airstrip and gravel mine.

7.2.2 Route B (Endicott to Point Thomson, Middle Coastal Alternative)

As shown in Figure 7-1, Route B begins at Endicott Road (similar to Route A), crosses the Endicott pipeline and the main channel of the Sagavanirktok River, then continues southeasterly to cross the Kadleroshilik and Shaviovik rivers in the vicinity of the King Street oil pool. From there, the route turns northeasterly, crossing the Sockeye pool until intersecting the West Staines State 2 gravel pad and continuing on to connect with the existing road system at Point Thomson's C-1 gravel pad (east of the airstrip).

7.2.3 Route C (Deadhorse to Point Thomson, Southerly Coastal Alternative)

As shown in Figure 7-1, Route C begins at the Dalton Highway near MP 411 (near Mine Site 65-9-102-2), crosses the west channel of the Sagavanirktok River, then traverses southeasterly to cross the main channel of the Sagavanirktok River. The route continues easterly, passing just south of Kadler airstrip and pad and north of Jacob's Ladder airstrip and pad. The route then crosses the Kadleroshilik River just north of Kad River well and airstrip and intersects the King Street pool and continues southeasterly across the Shaviovik River. From there, the route turns northeasterly

crossing the Sockeye pool and continuing on to connect with the existing road system at Point Thomson's C-1 gravel pad. Routes B and C share the same alignment for the final 1.5 miles near Point Thomson.

7.2.4 Loop Route (Dalton Highway to Point Thomson)

The Loop Route originates near Dalton Highway MP 368 (Figure 7-1). The route crosses the Sagavanirktok River and continues easterly through the Toolik River pool, then crosses the Shaviovik River and Juniper Creek (just north of Shaviovik Unit 1 well and the former airstrip). The route continues east for about 7 miles beyond Juniper Creek (roughly 8 miles north of the Kemik gas pool) before turning northeasterly and crossing the Kavik River just south of the Kavik airstrip and west of the Kavik gas pool. From there, it routes northeast toward the Sockeye, Yukon Gold, and Sourdough oil pools. Finally, the route connects with a planned road extension at Point Thomson.

7.3 Preliminary Screening of Route Alternatives

To eliminate less favorable routes and limit the number of alternatives carried forward for detailed analysis in Section 9.0, each route alternative was screened based on access to known O&G pools and access to active lease blocks not currently accessible from the contiguous road system. For this study, O&G pools and leases are considered accessible if the route passes within 10 miles.

Prudhoe Bay, Duck Island, and Beechey Point were not included in the analysis of O&G pools (despite being within the 10-mile offset) because access roads to these resources are already fully connected to the contiguous road system. The Toolik oil pool was included in the analysis (despite its existing connection with the Dalton Highway) because the proposed Loop Route would significantly improve access to the eastern portion of the oil pool.

Table 7-1 lists the alternative routes, route lengths, corresponding O&G pools intersected within a 10-mile offset, and the volume of O&G resources accessed. Figures 7-2 through 7-5 highlight each route alternative and the specific leases and O&G pools within the 10-mile offset.

Table 7-1 Comparison of Routes, Oil and Gas Pools, and Lease Access Opportunities

Route	Route Length (miles)	Lease blocks within 10 Miles of Route (acres)	O&G Pools within 10 Miles of Route	Oil Reserves Accessed (MMbo)[1]	Gas Reserves Accessed (Tcf)[2]
Route A	49.9	1,654,359	Badami, King Street, Liberty, Mikkelsen, Sockeye, Point Thomson, Sourdough, Yukon Gold	1,510	**8,000**
Route B	50.5	1,642,007	Badami, King Street, Liberty, Mikkelsen, Sockeye, Point	1,510	**8,000**

Route	Route Length (miles)	Lease blocks within 10 Miles of Route (acres)	O&G Pools within 10 Miles of Route	Oil Reserves Accessed (MMbo)[1]	Gas Reserves Accessed (Tcf)[2]
			Thomson, Sourdough, Yukon Gold		
Route C	57.6	1,822,079	Badami, King Street, Mikkelsen, Sockeye, Point Thomson, Sourdough, Yukon Gold	1,360	**8,000**
Loop Route	**91.2**	**1,115,116**	**Toolik, Kemik, Kavik, Kemik, Sockeye, Yukon Gold, Sourdough, Point Thomson**	**1,887**	**8,165**

Key: MMbo = million barrels of oil; O&G = oil and gas; Tcf = trillion cubic feet

Notes:

1. Oil reserves are estimated based on offshore and onshore oil pools intersected by a 10-mile offset from the proposed route centerline. Cumulative oil reserves are based on the data presented in Table 2-1 and are summed using in-place reserves data where available; otherwise, recoverable reserves data are used.
2. Gas reserves are estimated based on offshore and onshore gas pools intersected by a 10-mile offset from the proposed route centerline. Cumulative gas reserves are based on the data presented in Table 2-1 and are summed using in-place reserves data where available; otherwise, recoverable reserves data are used.

By dividing the lease areas and O&G reserves by the corridor lengths, the relative effectiveness of each route for providing access opportunities can be compared. Table 7-2 compares the lease areas and reserves accessed per mile for each route alternative.

Table 7-2 Comparison of Lease Areas and Reserves Accessed per Route Mile

Route	Lease Access per Route Mile (acres/mile)	Oil Reserves Accessed per Route Mile (MMbo/mile)	Gas Reserves Accessed per Route Mile (Tcf/mile)
Route A	33,168	30.27	**160.39**
Route B	32,530	29.91	**158.49**
Route C	31,647	23.62	**138.95**
Loop Route	**12,232**	**20.70**	**89.57**

Key: MMbo = million barrels of oil; Tcf = trillion cubic feet

As shown in Table 7-2, the routes nearer to the coastline are more favorable for accessing greater volumes of known and potential O&G accumulations per mile and a greater number of leases per mile. Accordingly, the Loop Route is eliminated from further consideration, and the following three coastal routes will be carried forward for more thorough analysis and comparison:

- Route A (Endicott to Point Thomson, most northerly coastal alternative)
- Route B (Endicott to Point Thomson, middle coastal alternative)

- Route C (Deadhorse to Point Thomson, southerly coastal alternative)

7.4 Major River Crossings

Hydrology is a key input to route analysis, specifically for identifying the locations of major crossings and the need to avoid crossings whenever possible. Table 7-3 lists major river crossings and the estimated bridge lengths for each route alternative. Potential bridge locations were identified using a combination of publicly available elevation data and color infrared (CIR) imagery (USGS 2008; DGGS 2006; State of Alaska 2026). Digital Elevation Model (DEM) data and derived hillshades aided in topographic characterization, while CIR imagery enhanced the observer's ability to distinguish vegetation, bare soils, man-made features, and water. The combination of these inputs improved interpretation of channel width and floodplain morphology, as well as assessment of ground and slope stability at potential crossings and approach conditions.

Generally, several bridge locations were identified for each route crossing. These were then further scrutinized by examining the approaches from each side and were narrowed to one preferred location per river or stream for each route. Feasible bridge crossing locations were identified at the outset of routing analyses, with subsequent efforts focused on the segments between each crossing.

Rivers on the North Slope can pose a significant hurdle due to the region's extreme climate and conditions associated with ice and snow. Bridge design and placement must account for seasonal changes in river flow rate and water-surface elevation, as well as for periodic climatic events such as ice jams that can result in inundation upstream of the blockage. Peak discharge for Arctic rivers typically occurs in spring and can vary depending on the season's snowfall and the rate of spring warming.

Table 7-3 Estimated Bridge Lengths

Route	Crossing Name	Estimated Bridge Length (feet)	Spans Required
Route A (Endicott to Point Thomson, most northerly coastal alternative)	Sagavanirktok River, main channel	3,371	**Multiple**
	East Sagavanirktok Creek	76	**Single**
	Kadleroshilik River	1,158	**Multiple**
	Unnamed River (tributary to Shaviovik)	204	**Multiple**
	Shaviovik River, side channel	869	**Multiple**
	Shaviovik River	1,708	**Multiple**
	Unnamed River (east of Shaviovik, main channel)	702	**Multiple**
	Unnamed River (east of Shaviovik, side channel)	199	**Multiple**
	East Badami Creek	453	**Multiple**
	Total Estimated Length of Bridges	***8,740***	

Route	Crossing Name	Estimated Bridge Length (feet)	Spans Required
Route B (Endicott to Point Thomson, middle coastal alternative)	Sagavanirktok River, main channel	1,337	**Multiple**
	Sagavanirktok River, main channel	419	**Multiple**
	Sagavanirktok River, main channel	391	**Multiple**
	Sagavanirktok River, main channel	1,642	**Multiple**
	Kadleroshilik River	1,060	**Multiple**
	Unnamed River (tributary to Shaviovik)	124	**Single**
	Shaviovik River	1,156	**Multiple**
	Shaviovik River, side channel	515	**Multiple**
	Unnamed River (east of Shaviovik)	693	**Multiple**
	East Badami Creek	444	**Multiple**
	Total Estimated Length of Bridges	***7,781***	
Route C (Deadhorse to Point Thomson, southerly coastal alternative)	Sagavanirktok River, west channel - side channel	245	**Multiple**
	Sagavanirktok River, west channel	838	**Multiple**
	Sagavanirktok River, west channel	4,131	**Multiple**
	Sagavanirktok River, main channel – side channel	1,992	**Multiple**
	Sagavanirktok River, main channel	1,099	**Multiple**
	Sagavanirktok River, main channel	1,883	**Multiple**
	Kadleroshilik River	1,661	**Multiple**
	Shaviovik River, side channel	171	**Multiple**
	Shaviovik River	1,337	**Multiple**
	Shaviovik River, side channel	305	**Multiple**
	Kavik River side channel	199	**Multiple**
	Unnamed River (east of Shaviovik)	824	**Multiple**
	East Badami Creek	456	**Multiple**
	Total Estimated Length of Bridges	***15,141***	

7.4.1 Sagavanirktok River

As previously discussed in Section 6.5.3, the Sag River splits into two large channels near the coast. The west channel is crossed by the existing Endicott Road system, and the main channel would be crossed as part of this proposed project. For any proposed routes that do not originate at Endicott Road, new bridges would be required to cross all channels of the Sag River.

Sagavanirktok River West Channel Bridge (WERC 2025)

The existing West Sag River Vehicle Bridge is a one-lane, five-span, 735-foot-long, steel box girder bridge supported on six piers 135- to 150-feet apart. Each pier has two 36-inch-diameter pipe piles embedded 70 to 90 feet below the streambed. The bridge deck is approximately 20 feet above the normal water level, and there are no icebreakers to protect the piers. The original bridge was constructed in 1975, and major reconstruction was conducted around 2008 or 2009 in preparation for the Liberty Development project (later cancelled). The reconstruction increased the load rating from 80 tons gross to 155 tons gross (PND 2008). Modifications included removing gravel fill from inside the piles and replacing it with reinforced concrete; replacing the pile caps; and constructing a new superstructure. The upgraded bridge includes removable and tilt-down guardrails.

Potential crossing locations are shown in Figures 7-2 through 7-5. For this study, it is assumed that the existing West Sag River Vehicle Bridge would again be modified or replaced with a two-lane bridge to accommodate increased traffic. As shown in Table 7-3, additional new bridges would be required to cross the main channel of the Sag River for Routes A and B. For Route C, located farther upstream, new bridges would be required for both the main and west channels. In addition to bridges, culvert batteries will be required at some locations within the floodplain.

7.4.2 East Sagavanirktok Creek

Route A crosses East Sagavanirktok Creek, a drainage that is approximately 4.5 miles long with a watershed of 90 square miles. The flow originates in the Arctic Coastal Plain, with headwaters approximately 5 miles from the coastline. A single-span bridge approximately 76 feet long is needed at the crossing location (Figure 7-2).

7.4.3 Kadleroshilik River

Three potential crossing locations have been identified for the northerly route alternatives (Figures 7-2 through 7-4). The Kadleroshilik River is generally narrower at these locations and is contained in a single channel. The Kadleroshilik River originates in the Arctic Foothills and flows across the Coastal Plain into Foggy Island Bay. It has a drainage area of approximately 590 square miles upstream of Route A, 584 square miles upstream of Route B, and 569 square miles upstream of Route C. The annual peak discharge is likely during spring breakup flooding. Summer flooding is not likely since the flow originates in the Foothills and is not influenced by rains in the Brooks Range (CH2M Hill 2005).

7.4.4 Unnamed River (Tributary to Shaviovik River)

Each of the three coastal routes crosses the unnamed tributary to the Shaviovik River (Figures 7-2 through 7-4). The tributary is a meandering beaded stream that flows into the mouth of the Shaviovik River. It has a drainage area of approximately 50 square miles upstream of Route A, 47 square miles upstream of Route B, and 37 square miles upstream of Route C.

7.4.5 Shaviovik River

From its headwaters in Juniper Creek to its mouth on the east side of Foggy Island Bay, the Shaviovik River is approximately 100 miles long. The headwaters are in the Brooks Range, but most of the drainage basin is in the Arctic Foothills. The main tributary to the Shaviovik River is the Kavik River, which joins about 10 miles upstream from its mouth (CH2M Hill 2005).

Three potential crossing locations have been identified for the northerly route alternatives (Figures 7-2 through 7-4). As shown in Table 7-3, two bridges are estimated for each crossing on Routes A and B, and three bridges are needed for Route C. The Shaviovik River has a drainage area of approximately 1,562 square miles upstream of Route A, 1,554 square miles upstream of Route B, and 1,547 square miles upstream of Route C.

7.4.6 Unnamed River (east of Shaviovik River)

All three coastal routes cross the unnamed river just east of the Shaviovik River. The river originates in the Arctic Foothills and flows through the Arctic Coastal Plain. Summer flooding is not likely since the flow originates in the Arctic Foothills and most drainage is within the Arctic Coastal Plain.

Potential crossing locations are shown in Figures 7-2 through 7-4. The unnamed river is approximately 42 miles long and drains a watershed of approximately 146 square miles upstream of Route A, 143 square miles upstream of Route B, and 139 square miles upstream of Route C.

7.4.7 East Badami Creek

East Badami Creek drains a watershed of approximately 90 square miles. The river originates in the Arctic Foothills and flows through the Arctic Coastal Plain. Summer flooding is not likely since the flow originates in the Arctic Foothills and most drainage is within the Arctic Coastal Plain.

Potential crossing locations are shown in Figures 7-2 through 7-4. East Badami Creek has a drainage area of approximately 90 square miles upstream of Route A, 86 square miles upstream of Route B, and 84 square miles upstream of Route C.

7.4.8 Other Drainage Structures

Besides major bridges, other drainage structures will include single culverts; culvert batteries or small single-span bridges over minor drainages; and equalizing culverts (also known as cross-drainage culverts) to facilitate meltwater or stormwater runoff at low points along the road alignment. The selected structure will depend on the drainage size, topography, hydrologic and hydraulic characteristics, fish and wildlife characteristics.

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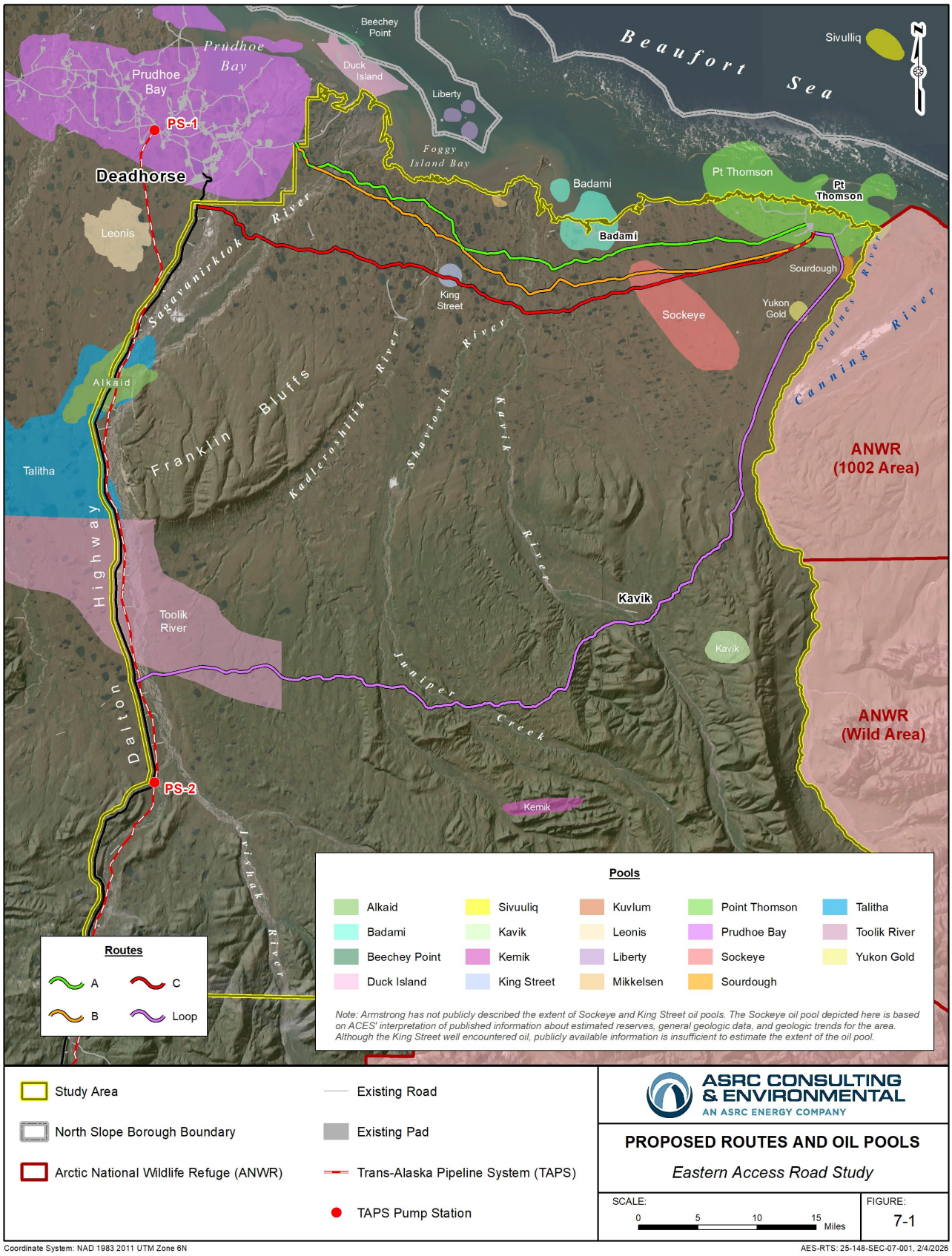
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Leonis
Sagavanirktok River
King Street
Sourdough
Yukon Gold
Sockeye
Sagavanirktok River
Staines River
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Kadleroshilik River
Shaviovik River
Kavik River
ANWR (1002 Area)
Talitha
Highway
Toolik River
Kavik
Kavik
Juniper Creek
ANWR (Wild Area)
Dalton
PS-2
Kemik
Ivishak River
Routes
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Loop
Pools
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Point Thomson
Talitha
Badami
Kavik
Leonis
Prudhoe Bay
Toolik River
Beechey Point
Kemik
Liberty
Sockeye
Yukon Gold
Duck Island
King Street
Mikkelsen
Sourdough
Note: Armstrong has not publicly described the extent of Sockeye and King Street oil pools. The Sockeye oil pool depicted here is based on ACES' interpretation of published information about estimated reserves, general geologic data, and geologic trends for the area. Although the King Street well encountered oil, publicly available information is insufficient to estimate the extent of the oil pool.
Study Area
North Slope Borough Boundary
Arctic National Wildlife Refuge (ANWR)
Existing Road
Existing Pad
Trans-Alaska Pipeline System (TAPS)
TAPS Pump Station
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
PROPOSED ROUTES AND OIL POOLS
Eastern Access Road Study
SCALE:
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FIGURE:
7-1
Coordinate System: NAD 1983 2011 UTM Zone 6N
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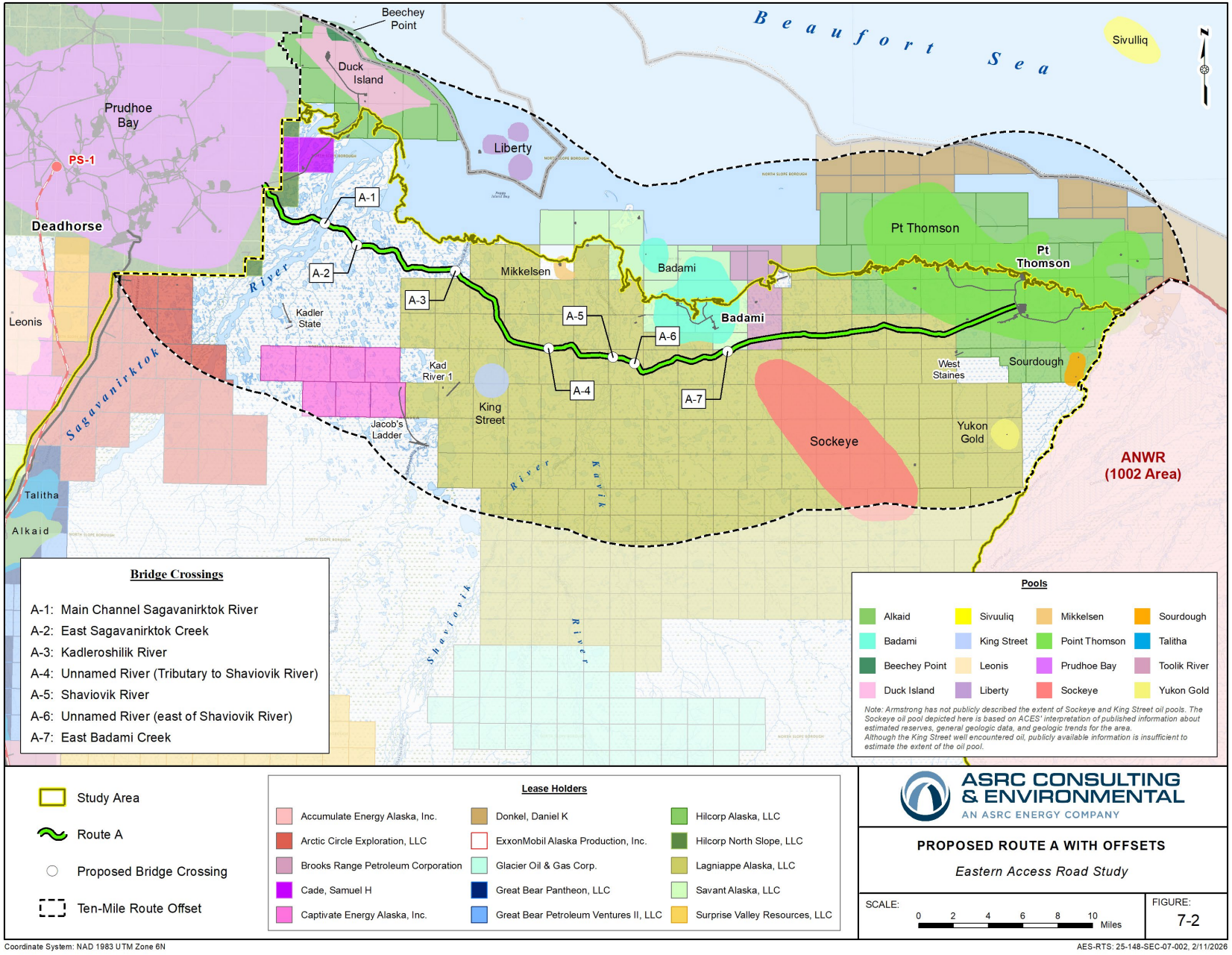
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A-7
Mikkelsen
Badami
Pt Thomson
Pt Thomson
Leonis
Kadler State
Kad River 1
King Street
Jacob's Ladder
West Staines
Sourdough
Sockeye
Yukon Gold
ANWR (1002 Area)
Talitha
Alkaid
Sagavanirktok River
Kavik River
Shaviovik River
Bridge Crossings
A-1: Main Channel Sagavanirktok River
A-2: East Sagavanirktok Creek
A-3: Kadleroshilik River
A-4: Unnamed River (Tributary to Shaviovik River)
A-5: Shaviovik River
A-6: Unnamed River (east of Shaviovik River)
A-7: East Badami Creek
Pools
Alkaid
Badami
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Duck Island
Sivuuliq
King Street
Leonis
Liberty
Mikkelsen
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Prudhoe Bay
Sockeye
Sourdough
Talitha
Toolik River
Yukon Gold
Note: Armstrong has not publicly described the extent of Sockeye and King Street oil pools. The Sockeye oil pool depicted here is based on ACES' interpretation of published information about estimated reserves, general geologic data, and geologic trends for the area. Although the King Street well encountered oil, publicly available information is insufficient to estimate the extent of the oil pool.
Study Area
Route A
Proposed Bridge Crossing
Ten-Mile Route Offset
Lease Holders
Accumulate Energy Alaska, Inc.
Arctic Circle Exploration, LLC
Brooks Range Petroleum Corporation
Cade, Samuel H
Captivate Energy Alaska, Inc.
Donkel, Daniel K
ExxonMobil Alaska Production, Inc.
Glacier Oil & Gas Corp.
Great Bear Pantheon, LLC
Great Bear Petroleum Ventures II, LLC
Hilcorp Alaska, LLC
Hilcorp North Slope, LLC
Lagniappe Alaska, LLC
Savant Alaska, LLC
Surprise Valley Resources, LLC
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
PROPOSED ROUTE A WITH OFFSETS
Eastern Access Road Study
SCALE:
0 2 4 6 8 10 Miles
FIGURE:
7-2
Coordinate System: NAD 1983 UTM Zone 6N
AES-RTS: 25-148-SEC-07-002, 2/11/2026

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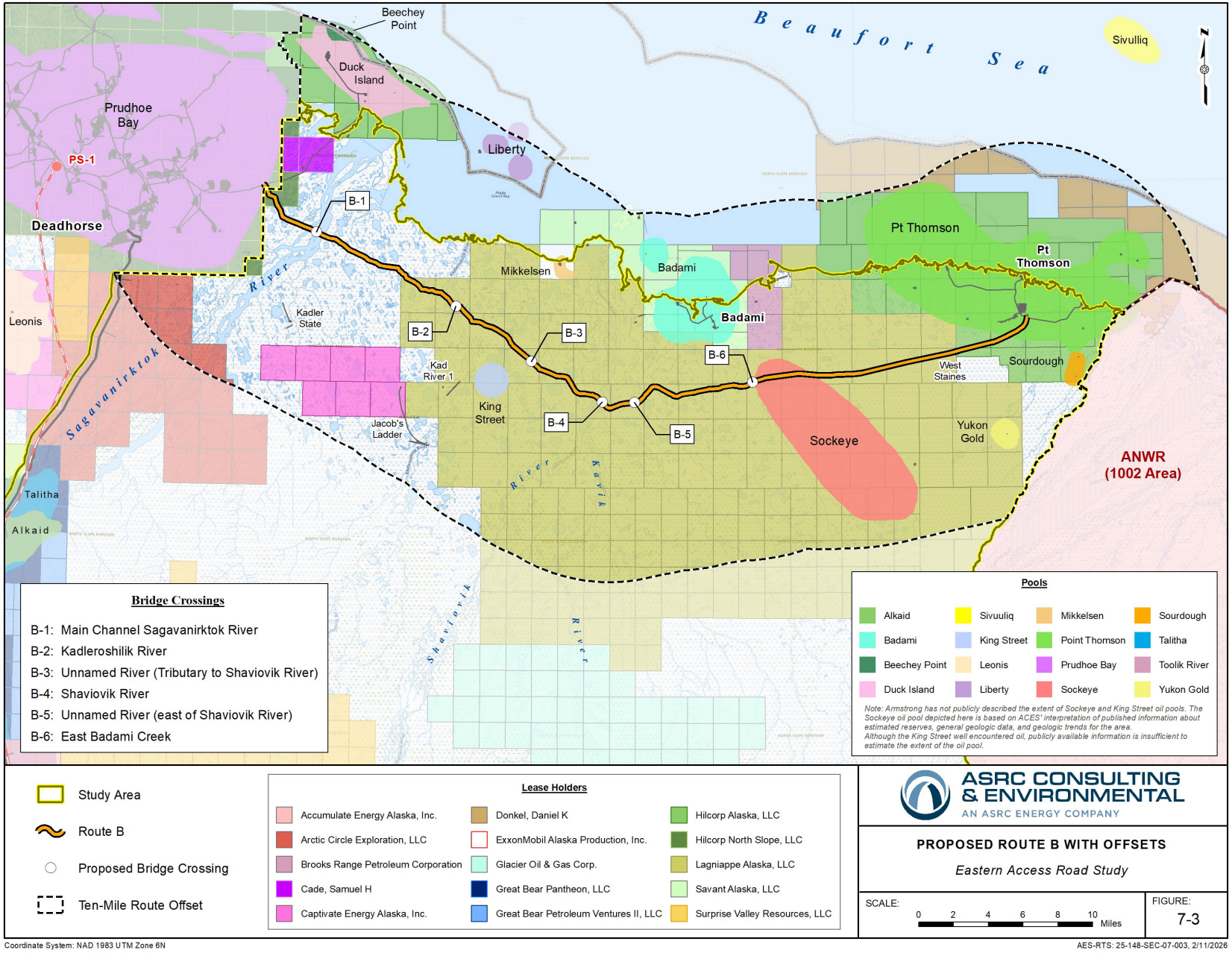
Beechey Point
Duck Island
Beaufort Sea
Sivulliq
Prudhoe Bay
PS-1
Deadhorse
Liberty
B-1
Pt Thomson
Pt Thomson
Mikkelsen
Badami
Badami
Leonis
Kadler State
River
B-2
B-3
B-6
West Staines
Sourdough
Kad River 1
King Street
B-4
B-5
Jacob's Ladder
Sagavanirktok
Sockeye
Yukon Gold
ANWR (1002 Area)
Talitha
Alkaid
Kavik River
Shaviovik River
Bridge Crossings
B-1: Main Channel Sagavanirktok River
B-2: Kadleroshilik River
B-3: Unnamed River (Tributary to Shaviovik River)
B-4: Shaviovik River
B-5: Unnamed River (east of Shaviovik River)
B-6: East Badami Creek
Pools
Alkaid
Sivuliq
Mikkelsen
Sourdough
Badami
King Street
Point Thomson
Talitha
Beechey Point
Leonis
Prudhoe Bay
Toolik River
Duck Island
Liberty
Sockeye
Yukon Gold
Note: Armstrong has not publicly described the extent of Sockeye and King Street oil pools. The Sockeye oil pool depicted here is based on ACES' interpretation of published information about estimated reserves, general geologic data, and geologic trends for the area. Although the King Street well encountered oil, publicly available information is insufficient to estimate the extent of the oil pool.
Study Area
Route B
Proposed Bridge Crossing
Ten-Mile Route Offset
Lease Holders
Accumulate Energy Alaska, Inc.
Arctic Circle Exploration, LLC
Brooks Range Petroleum Corporation
Cade, Samuel H
Captivate Energy Alaska, Inc.
Donkel, Daniel K
ExxonMobil Alaska Production, Inc.
Glacier Oil & Gas Corp.
Great Bear Pantheon, LLC
Great Bear Petroleum Ventures II, LLC
Hilcorp Alaska, LLC
Hilcorp North Slope, LLC
Lagniappe Alaska, LLC
Savant Alaska, LLC
Surprise Valley Resources, LLC
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
PROPOSED ROUTE B WITH OFFSETS
Eastern Access Road Study
SCALE:
0 2 4 6 8 10 Miles
FIGURE:
7-3
Coordinate System: NAD 1983 UTM Zone 6N
AES-RTS: 25-148-SEC-07-003, 2/11/2026

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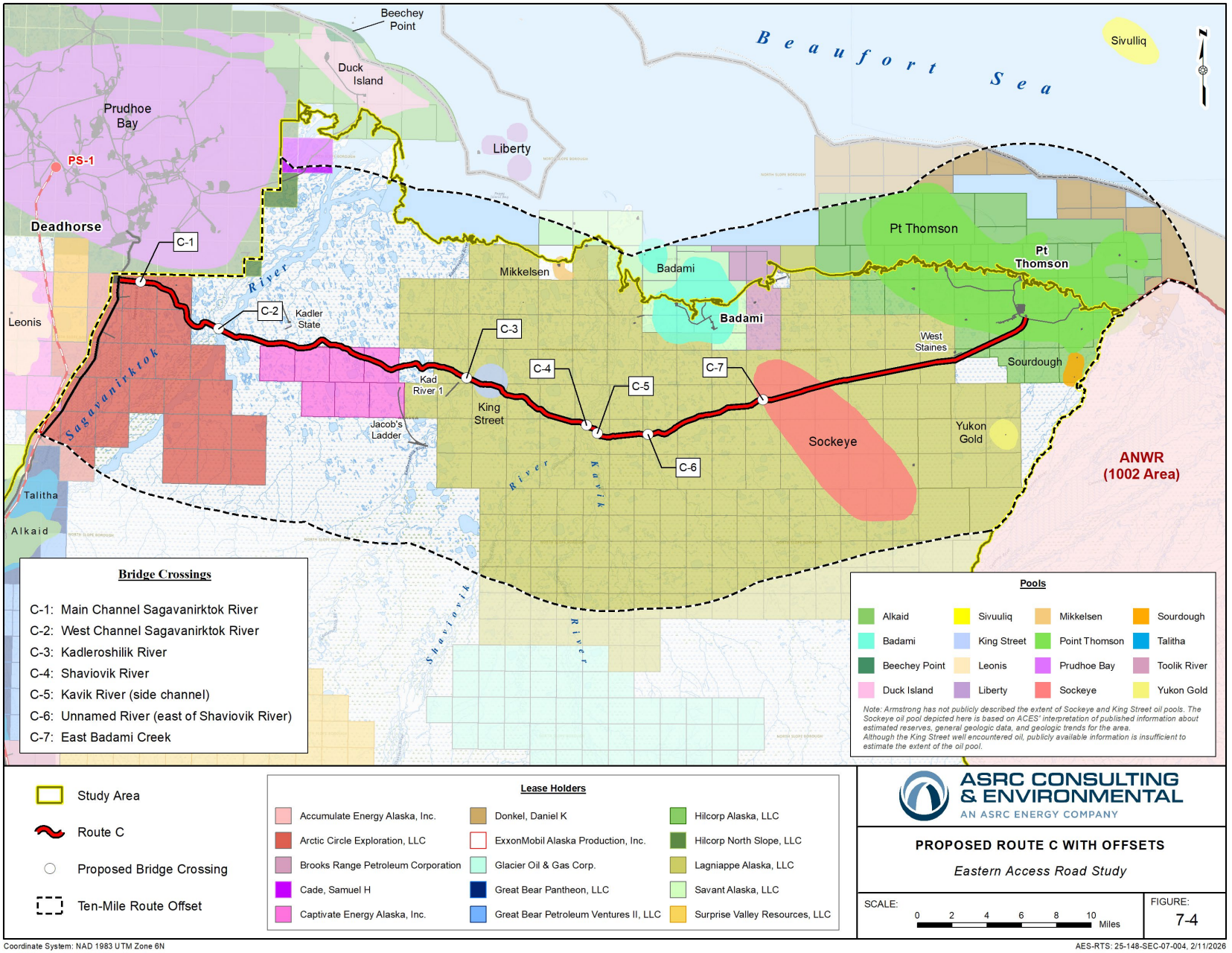
Beechey Point
Duck Island
Prudhoe Bay
PS-1
Deadhorse
Liberty
Beaufort Sea
Sivulliq
Pt Thomson
Pt Thomson
Mikkelsen
Badami
Badami
West Staines
Sourdough
Leonis
C-1
C-2
Kadler State
C-3
C-4
C-5
C-6
C-7
Kad River 1
King Street
Jacob's Ladder
Sagavanirktok River
Kavik River
Shaviovik River
Sockeye
Yukon Gold
ANWR (1002 Area)
Talitha
Alkaid
Bridge Crossings
C-1: Main Channel Sagavanirktok River
C-2: West Channel Sagavanirktok River
C-3: Kadleroshilik River
C-4: Shaviovik River
C-5: Kavik River (side channel)
C-6: Unnamed River (east of Shaviovik River)
C-7: East Badami Creek
Pools
Alkaid
Sivuuliq
Mikkelsen
Sourdough
Badami
King Street
Point Thomson
Talitha
Beechey Point
Leonis
Prudhoe Bay
Toolik River
Duck Island
Liberty
Sockeye
Yukon Gold
Note: Armstrong has not publicly described the extent of Sockeye and King Street oil pools. The Sockeye oil pool depicted here is based on ACES' interpretation of published information about estimated reserves, general geologic data, and geologic trends for the area. Although the King Street well encountered oil, publicly available information is insufficient to estimate the extent of the oil pool.
Study Area
Route C
Proposed Bridge Crossing
Ten-Mile Route Offset
Lease Holders
Accumulate Energy Alaska, Inc.
Arctic Circle Exploration, LLC
Brooks Range Petroleum Corporation
Cade, Samuel H
Captivate Energy Alaska, Inc.
Donkel, Daniel K
ExxonMobil Alaska Production, Inc.
Glacier Oil & Gas Corp.
Great Bear Pantheon, LLC
Great Bear Petroleum Ventures II, LLC
Hilcorp Alaska, LLC
Hilcorp North Slope, LLC
Lagniappe Alaska, LLC
Savant Alaska, LLC
Surprise Valley Resources, LLC
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
PROPOSED ROUTE C WITH OFFSETS
Eastern Access Road Study
SCALE:
0 2 4 6 8 10 Miles
FIGURE:
7-4
Coordinate System: NAD 1983 UTM Zone 6N
AES-RTS: 25-148-SEC-07-004, 2/11/2026

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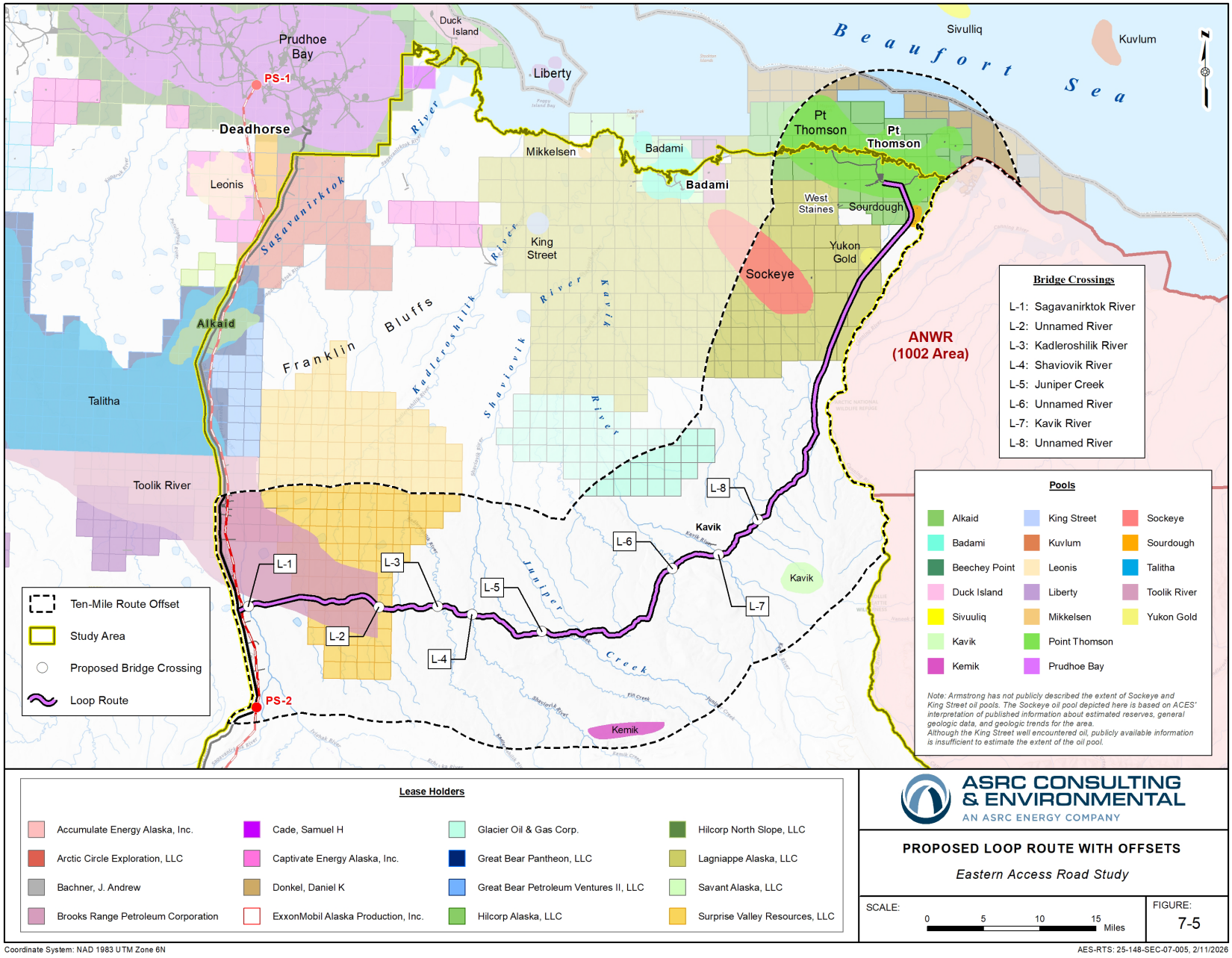
Prudhoe Bay
Duck Island
Sivulliq
Kuvlum
Beaufort Sea
PS-1
Deadhorse
Liberty
Mikkelsen
Badami
Pt Thomson
Leonis
Sagavanirktok River
King Street
West Staines
Sourdough
Yukon Gold
Sockeye
Alkaid
Franklin Bluffs
Kadleroshilik River
Shaviovik River
Kavik River
Juniper Creek
ANWR (1002 Area)
Talitha
Toolik River
Kavik
Kemik
PS-2
L-1
L-2
L-3
L-4
L-5
L-6
L-7
L-8
Bridge Crossings
L-1: Sagavanirktok River
L-2: Unnamed River
L-3: Kadleroshilik River
L-4: Shaviovik River
L-5: Juniper Creek
L-6: Unnamed River
L-7: Kavik River
L-8: Unnamed River
Pools
Alkaid
Badami
Beechey Point
Duck Island
Sivuuliq
Kavik
Kemik
King Street
Kuvlum
Leonis
Liberty
Mikkelsen
Point Thomson
Prudhoe Bay
Sockeye
Sourdough
Talitha
Toolik River
Yukon Gold
Note: Armstrong has not publicly described the extent of Sockeye and King Street oil pools. The Sockeye oil pool depicted here is based on ACES' interpretation of published information about estimated reserves, general geologic data, and geologic trends for the area. Although the King Street well encountered oil, publicly available information is insufficient to estimate the extent of the oil pool.
Ten-Mile Route Offset
Study Area
Proposed Bridge Crossing
Loop Route
Lease Holders
Accumulate Energy Alaska, Inc.
Arctic Circle Exploration, LLC
Bachner, J. Andrew
Brooks Range Petroleum Corporation
Cade, Samuel H
Captivate Energy Alaska, Inc.
Donkel, Daniel K
ExxonMobil Alaska Production, Inc.
Glacier Oil & Gas Corp.
Great Bear Pantheon, LLC
Great Bear Petroleum Ventures II, LLC
Hilcorp Alaska, LLC
Hilcorp North Slope, LLC
Lagniappe Alaska, LLC
Savant Alaska, LLC
Surprise Valley Resources, LLC
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
PROPOSED LOOP ROUTE WITH OFFSETS
Eastern Access Road Study
SCALE:
0 5 10 15 Miles
FIGURE:
7-5
Coordinate System: NAD 1983 UTM Zone 6N
AES-RTS: 25-148-SEC-07-005, 2/11/2026

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8.0 COST ESTIMATES

This section provides rough order-of-magnitude (ROM) cost estimates for construction of potential routes for the Eastern Access Road. The basis of the estimate, detailing the procedures, assumptions, and methodology, is provided below.

8.1 Accuracy

The accuracy of the estimates provided is assumed to be Class 4, based on the current schematic level of design (AACE 2020). Contingency costs have been excluded from the estimates but would typically be applied at a rate of 20 percent to 50 percent of the total estimated construction cost.

All costs presented should be considered preliminary in nature; and materials, fabrication, and transportation costs will vary over time based on inflation, procurement procedures, and project implementation.

8.2 Estimate Methodology

Publicly available cost data from previous North Slope projects is limited. Therefore, estimates were developed using crew- and resource-loaded bottom-up estimating techniques based on historical and anticipated production rates of assemblies composed of personnel, equipment, and materials. These assemblies were then combined to form tasks associated with cost category items within the cost breakdown structure.

8.3 Basis of Estimate

8.3.1 Estimated Scope

The cost estimates developed here encompass the civil infrastructure associated with the Eastern Access Road. Costs include haul and placement of gravel embankment, drainage culverts and culvert batteries, gravel-haul ice roads, gravel mine development and mining royalties, summer gravel rework, and bridge construction.

A separate estimate was prepared for each of the three route alternatives (Routes A, B, and C). Estimates include all applicable direct construction costs, as well as all contractor-incurred indirect costs, including construction camp rental, support and maintenance staff, contractor quality assurance and quality control (QA/QC), construction surveying, weather contingency days and fuel costs.

A summary of the civil infrastructure associated with the proposed corridors is provided in Table 8-1.

Table 8-1 Route Alternative Summary

Route	Total Route Length (miles)	Number of Bridges	Total Length of Bridges (linear feet)	No. Major Culverts or Culvert Batteries	Proposed Road Top Width (ft)	Assumed Road Prism Thickness (feet)
Route A (most northerly coastal alternative)	49.9	9	8,740	22	30	6
Route B (middle coastal alternative)	50.5	10	7,781	19	30	6
Route C (southerly coastal alternative)	57.6	13	15,141	18	30	6

8.3.2 Logistics and Transportation

Assumed logistics hubs for each route include Deadhorse on the west end, Point Thomson on the east end, and potentially Badami or Bullen Point near the midpoint if advantageous.

Badami and Point Thomson both include dock facilities, airstrips, and road and pad infrastructure that could be useful for construction contractors. Bullen Point also has an airstrip and laydown space that could be useful.

Use of any of these facilities for logistics hubs, equipment staging, construction camps, resupply points, or other uses would require permission and commercial agreements with the landowners, field owners, and operators.

8.3.3 Cost Breakdown Structure

The estimates are separated into primary components that comprise the work to be performed and are further broken down into subcomponents, based on assemblies created using the personnel, equipment, and materials used to complete the work. A brief description of the cost breakdown structure is provided in Table 8-2.

Table 8-2 Cost Breakdown Structure Definitions

Category	Description	Basis
Mobilization and Demobilization	Encompasses all costs associated with mobilizing and demobilizing all personnel, equipment, camps, and materials required to complete the scope of work.	All routes are assumed to require multiple seasonal mobilizations and demobilizations. All construction materials and equipment are assumed to be dispatched from Deadhorse for the western half of the route and from Point Thomson for the eastern half. Infrastructure capable of supporting heavy-haul items is assumed to be in place at either end of the proposed routes.

Category	Description	Basis
Ice Roads and Pads	Cost of constructing and maintaining seasonal ice roads and pads used to facilitate construction of the permanent road. Pads are used for temporary storage or staging of materials and equipment.	Ice road lengths are derived from an assumed 5-mile water source access road distance plus approximately 2 x the total length of constructed gravel roads to account for two seasons of ice roads.
Resource Royalty	Cost of royalty payments to the State of Alaska for the right to extract, remove, and use gravel from mine sites.	$3 per cubic yard (cy) royalty.
Gravel Mine	Cost of developing gravel sources for roads and pads. Includes access road development, overburden stripping and stockpiling, drilling and blasting, and reclamation work.	Existing gravel mines in the project area are not expected to provide the volume and quality of material needed for the project scope; therefore, new gravel sources are anticipated to be developed. A gravel source is anticipated every 10 miles of constructed road to minimize haul distances. Costs are approximated based on similar remote Alaska development projects. Mine development and mining costs are estimated with 1.5–2.0 million cy of gravel mined per material source and includes a $3/cy royalty, the cost of overburden removal and storage, drilling, blasting, stockpiling and loading, and short-term (seasonal) mine site remediation.
Road Embankment	The cubic yardage depicted under this line item represents a neat-line quantity of gravel. The costs presented include hauling, placing, and rough grading the material during winter embankment construction.	Gravel hauling quantities are assumed to be 30% over neat-line quantities to account for thaw consolidation and compaction during embankment construction. The average road prism is assumed to be 7.5-ft tall with a 32-ft shoulder-to-shoulder width and 2:1 side slopes. This allows for an estimated 1.5-ft of settlement due to thawing after the first season.
Summer Work	Summer work includes reworking and compacting the winter-placed gravel to final slopes and grades.	Summer rework is based on cubic yards of gravel needing to be reworked on the final slopes and grades. Approximately 10% of the winter placed gravel is reworked.
Equalization Pipes	Cost of procuring and installing equalization pipes for cross drainage.	Cross drainage equalization pipe every 1,500 ft on average.
Major Culverts	Includes procurement and installation of major culverts and culvert batteries at drainages that do not require a bridge.	Major culverts are assumed to be 48-inch diameter by 200 feet long, and pricing is based on recent material quotes. Major culvert cost includes an allowance for scour rock and fish passage improvements.

Category	Description	Basis
Bridges	Installed cost of all bridges, including abutments, substructures, and superstructures. Ice pads associated with the bridges are included above under the "Ice Roads and Pads" category.	Bridge costs are based on recently constructed North Slope bridges. Bridge cost is calculated using $1,800 per square foot (sq ft) for smaller bridges and $1,400/sq ft for larger bridges over 1,000 feet long.
Signs and Delineators	Cost of procuring and installing traffic signs and roadway delineators at approximately 60 feet on center. Signs are placed every mile.	Signs and delineators are priced on recent quotes plus install time.
Camp Operation, Meals, & Travel	Cost of camp rental, operations, maintenance, meals, and personnel travel.	Camp rental and operations are based on a 30-person crew working approximately 34 months to complete the project.
Surveying	Cost of surveying support during construction.	Surveying is based on an average cost of $40,000 per mile.
Erosion and Pollution Control	Cost of preparing a Stormwater Pollution Prevention Plan (SWPPP) and installing and maintaining erosion and stormwater pollution-prevention measures.	Erosion and pollution control is based on an average of $50,000 per mile.

Key: cy = cubic yard; sq ft = square foot; SWPPP = Stormwater Pollution Prevention Plan

8.3.4 Equipment and Materials Pricing

Equipment costs are based on historically compiled rates from North Slope heavy civil contractors and are presented in current (2026) prices with no allowance for inflation. Material prices are based on historically compiled rates from material suppliers and fabricators and are presented in current (2026) prices with no allowance for inflation.

8.3.5 Labor Rates and Factors

Labor rates for this estimate are a blended composite rates based on 2026 labor rates for Operating Engineers Local 302. Labor rates include a standard markup for contractor's payroll tax, overhead, general and administrative expenses, and a contingency markup.

The assumed work schedule is 12 hours per day, 7 days per week for the duration of the project, and the wages include a markup of 1.5x for overtime hours.

8.4 Estimate Assumptions

8.4.1 General

To provide a reliable basis for developing the cost estimates for the proposed corridors, assumptions were made to define critical work elements and factors that will influence the total estimated cost. The following section details the assumptions made during the development of this estimate.

8.4.2 Project Contract Structure

It is assumed that the civil infrastructure and bridges will be issued as a lump sum fixed fee contract.

It is assumed that, for the purpose of this project, there will be no owner-provided materials and services.

This estimate omits owner-provided quality assurance, engineering support, and contract management/oversight.

8.4.3 Cost Estimate Assumptions

General

- The project will be constructed using two civil crew spreads at all times.
- All initial embankment construction will require placement in winter conditions.
- Permitting costs are not included in this estimate.
- Labor, materials, equipment, maintenance and fuel costs are included in the specific work items.
- The cost of diesel fuel is assumed to be $6 per gallon.
- Temporary shops, offices, and camps will stay onsite throughout the duration of the project.
- Gravel embankment construction, grading, and compaction will be completed in two seasons.
- Bridges will take a third season to complete.
- Due to springtime road restrictions, large bridge girders and equipment will have to be mobilized in the winter or summer months. Mid-April to June 1 is the typical timeframe for road restrictions and bridge outages for large transport.

Ice Roads and Maintenance

- Except for minor filling and grading, all borrow will be hauled in winter. Ice road construction is required for safe and efficient hauling.

- An average cost of $175,000 per mile of ice road is assumed for construction.
- Maintenance (watering and grading) is assumed to be included in other work items.
- Two miles of ice road will be constructed per completed mile of gravel road on average to account for multiple winters on road corridors.

Resource Royalty Charge

- Gravel royalty assumed at $3 per cy.

Pit Development and Overburden Removal

- Borrow sources are available every 10 miles or less, on average.
- Borrow sources will be developed using drill-and-shoot methods.
- An average of 12 feet of overburden and 24 feet of borrow is assumed at each borrow source.
- Pit reclamation will include depositing overburden back into mined areas, grading, and seeding.

Culverts

- Experience dictates that watershed equalization culverts are required at regular intervals regardless of natural stream location. This estimate assumes 36-inch culverts spaced at 1,500-foot intervals.
- Major culverts are assumed to be 48 inches in diameter by 200 feet long.
- Major culvert cost includes an allowance for scour rock and fish passage improvements.

Camp Operations

- Historical data supports an assumed man-day cost of $400 for camps, including camp setup, operations, maintenance, and food.

Surveying

- Construction survey (survey control and staking) estimated at $40,000 per mile of road.

Erosion and Pollution Control

- Includes all stormwater control and countermeasures, Alaska Department of Environmental Conservation (DEC) Construction General Permit compliance, and administrative efforts. Estimated at $50,000 per mile.

Management, Supervision, and Incidental Project Costs

- Includes project management and field supervision.
- Includes equipment maintenance and daily equipment transportation on the job.

- Includes equipment standby costs.
- Includes all personnel travel costs to and from the project (Anchorage as the starting point for all travel).
- Includes a total of 30 inclement-weather days.
- Includes the cost of field office space required for project administration and management.
- Includes the cost of temporary equipment maintenance shops.

Contingency

- Contingency has not been included in the estimate. An allowance of 20 percent of cost is assumed to be reasonable.

Escalation

- Escalation has not been included in this estimate. An escalation rate of 4 percent per season is assumed to be reasonable. The estimate assumes a 3-year project duration with two crews working for the entirety of the project.

Contractor Markup

- Markup has been included at an assumed 10 percent on a cost basis for equipment, materials, and subcontractors. Man-hour rates are all-inclusive of burdens and markup.

Exclusions

- Geotechnical exploration needed for bridge foundations and identifying gravel sources
- Owner engineering support and QA/QC positions
- Escalation
- Legal costs
- Engineering, permitting, and contract management
- Long-term mine site remediation
- Contingency

8.5 Schedule

The estimate assumes a 3-year schedule for the project with mine site development and operation and rough grading of the road embankment during winter months when ice roads can facilitate construction. Final grading will occur during summer months. Substructures for bridge crossings would be constructed during winter, and superstructures would be constructed during both winter and summer.

The construction window for winter gravel placement and compaction is generally over a 3-month period, beginning after the construction of the on-tundra ice roads and pads, typically in mid-January.

Construction of on-tundra ice roads required for project access will begin pending receipt of approval from the ADNR for on-tundra access (estimated mid-January). Early season pre-packing of snow for the on-tundra ice roads will be used to allow earlier (mid-December) approval for tundra access.

For the purposes of this report, ice roads are assumed to be in usable condition by January 15, with construction continuing to a completed condition by February 15, and remaining usable with ongoing maintenance until April 15.

The estimate assumes a 3-year schedule for the bridge construction, including construction of ice pads and installation of piles, abutments, girders, and decking.

8.6 Cost Estimates

ROM estimates for Routes A, B, and C are presented below in Tables 8-3 through 8-5, respectively.

Table 8-3 Route A (Endicott to Point Thomson, most northerly coastal alternative) ROM Costs

Item	Estimated Cost
Labor	$71,391,085
Materials	$36,151,785
Subcontractors	$424,100,238
Equipment	$97,166,561
Lodging and **Meals**	$12,504,000
Cost	$641,313,669
10% Markup on Materials, Subcontractors, and Equipment	$56,992,258
Total Estimated Cost	**$698,305,927**
Total Cost/Mile with Bridges	$13,994,107
Road Cost/Mile without Bridges	$5,261,610

Table 8-4 Route B (Endicott to Point Thomson, middle coastal alternative) ROM Costs

Item	Estimated Cost
Labor	$70,898,222
Materials	$36,065,128

Item	Estimated Cost
Subcontractors	$387,554,723
Equipment	$97,046,111
Lodging and **Meals**	$12,504,000
Cost	$604,068,184
10% Markup on Materials, Subcontractors, and Equipment	$53,316,996
Total Estimated Cost	**$657,385,180**
Total Cost/Mile with **Bridges**	$13,017,528
Road Cost/Mile without Bridges	$5,242,324

Table 8-5 Route C (Deadhorse to Point Thomson, southerly coastal alternative) ROM Costs

Item	Estimated Cost
Labor	$87,436,557
Materials	$38,707,241
Subcontractors	$691,917,954
Equipment	$117,512,495
Lodging and **Meals**	$12,504,000
Cost	$948,078,246
10% Markup on Materials, Subcontractors, and Equipment	$86,064,169
Total Estimated Cost	**$1,034,142,415**
Total Cost/Mile with Bridges	$17,953,861
Road Cost/Mile without Bridges	$5,144,939

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9.0 ANALYSIS OF ALTERNATIVES

This section compares the three coastal route alternatives using the engineering, environmental, regulatory, and infrastructure considerations described in previous sections.

Figures 9-1 through 9-3 show each of the proposed coastal route alternatives along with key constraints affecting routing. Based on the information presented in Section 6.0, all three coastal routes are very similar with regard to effects on land tenure, wildlife resources, cultural and paleontological resources, subsistence use areas, wetlands, and physiography. Likewise, each of the routes is similar regarding the benefits listed in Section 3.0 and access to gravel resources described in Section 5.4.

All three coastal alignments provide routing that generally follows areas of higher ground to minimize impacts to wetlands or allow for more economic mitigation of these impacts. Routing also emphasizes minimal water body crossings and, when necessary, seeks the narrowest crossing locations.

All proposed route alignments take advantage of information provided by prior routing studies, as well as knowledge derived from annual and periodic snow trail and ice road construction in the area.

The primary differentiators among the route alternatives are access to O&G resources and construction cost. Construction cost is primarily a function of overall route length and total length of bridges. Table 9-1 presents a comparative summary of key differentiators.

Table 9-1 Comparison of Coastal Route Alternatives

Description	Route A (most northerly coastal alternative)	Route B (middle coastal alternative)	Route C (southerly coastal alternative)
Point of Origin	Endicott Road	Endicott Road	Deadhorse
Terminus	Point Thomson (road system north of airstrip)	Point Thomson (Pad C-1 east of airstrip)	Point Thomson (Pad C-1 east of airstrip)
Length (miles)	49.9	50.5	57.6
Oil Reserves Accessed per Route Mile (MMbo/mile)	30.27	29.91	23.62
Gas Reserves Accessed per Route Mile (Tcf/mile)	160.39	158.49	138.95
Lease Access per Route Mile (acres/mile)	33,168	32,530	31,647
Number of Bridges	9	10	13
Total Estimated Length of Bridges (feet)	8,740	7,781	15,141

Description	Route A (most northerly coastal alternative)	Route B (middle coastal alternative)	Route C (southerly coastal alternative)
Longest Bridge (feet)	3,371 (Main Channel Sagavanirktok River)	1,642 (Main Channel Sagavanirktok River)	4,131 (West Channel Sagavanirktok River)
Number of Major Culverts or Culvert Batteries	22	19	18
Number of Anadromous Stream Crossings	5	4	3
Estimated Wetlands Impacted (acres)	299	302	349
Estimated Construction Cost ($ millions)	$698.3	$657.4	$1,034.1

Notes: Green = most favorable; Pink = least favorable; Yellow = second most favorable.
Key: MMbo = million barrels of oil; Tcf = trillion cubic feet

As shown in Table 9-1, Routes A and B are very similar and generally more advantageous than Route C for improved access to O&G reserves. Route B is the least costly to construct, largely because of its shorter total bridge length. Other key differences among the routes are summarized below.

Access and regulatory considerations.

- Routes A and B originate at Endicott Road. Access at this location is generally restricted to authorized O&G operations because Hilcorp's guard station on the Spine Road limits general public access by travelers arriving via the Dalton Highway or the Deadhorse airport. Because access at this location is already restricted, either route would likely be classified as an industrial oilfield road, and ADOT&PF highway restrictions for commercial vehicles would not necessarily apply.
- Route C originates at Deadhorse, so access permissions would be related to funding sources. If construction is funded by the O&G industry, access could be restricted to authorized O&G activities, whereas if construction is funded exclusively by the state, general public access would likely be required.
- Route C originates within the Dalton Highway Legislatively Designated Area (LDA) described in AS § 19.40.210 (see Section 5.2). The LDA includes significant restrictions on motorized use within the LDA, with the intent of preserving its undeveloped nature, although limited exceptions allow for access by the O&G industry, holders of mining claims, trapping, and travel across the corridor using snowmachines. Any plan to build a permanent road within the LDA would need approval from land managers at ADNR, ADOT&PF, and likely ADF&G. An applicant would have to demonstrate a public need for the project.

Engineering and infrastructure considerations:

- Routes A and B benefit from the existing West Sagavanirktok River vehicle bridge. However, the current bridge is only a single-lane bridge and would need to be modified or replaced to accommodate two-way traffic. Route C requires spanning both the west and main channels of the Sagavanirktok River with new bridges.
- Route C requires construction of the longest individual bridge of the routes, at 4,131 feet across the west channel of the Sagavanirktok River. Route B requires the shortest bridge span across the main channel of the Sagavanirktok River at 1,642 feet, and Route A requires the second longest span, at 3,371 feet across the main channel.
- The number of major culverts and culvert batteries varies, with Route A at 22 locations, Route B at 19, and Route C at 18.
- Route A lies closest to existing pipeline corridors, facilitating better access for maintenance, inspection, and spill response. Route A also provides the shortest distance for a spur road to connect with existing Badami infrastructure.

Environmental considerations:

- Route C crosses the fewest anadromous streams (three), primarily because it is located farther from the coast; Route B crosses four and Route A crosses five.
- Based on NWI data, Route A crosses the fewest wetlands (299 acres), followed by Route B (302 acres) and Route C (349 acres). These acreages are based on an assumed average 50-foot-wide footprint for the road.

Overall, the three coastal routes exhibit similar characteristics with respect to environmental setting, land tenure, and general routing constraints. However, Routes A and B provide greater access to O&G resources and lower estimated construction costs compared with Route C. The comparative evaluation presented in this section provides the basis for the summary findings and recommended next steps discussed in Section 10.0.

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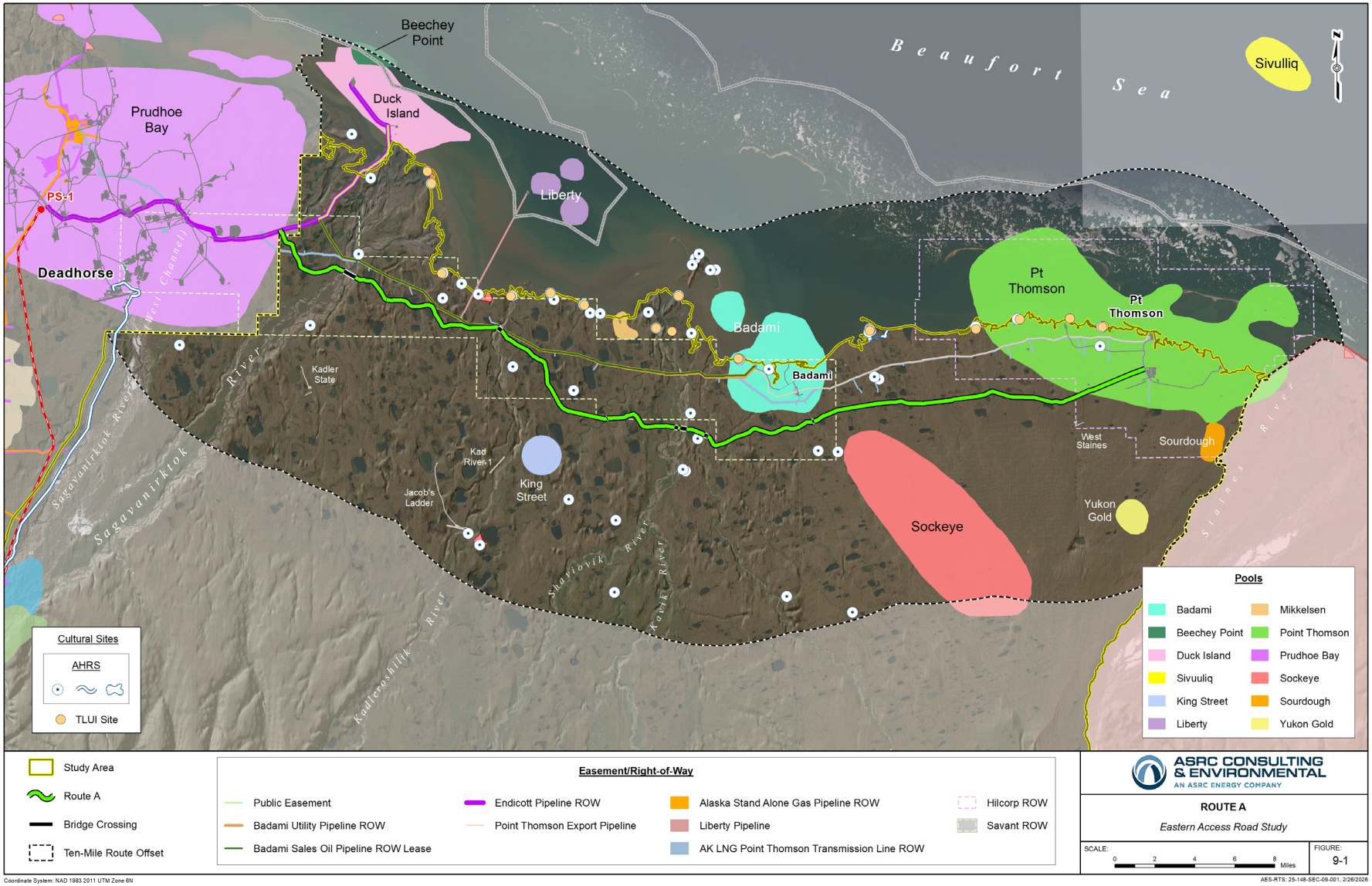
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Yukon Gold
Sockeye
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Public Easement
Badami Utility Pipeline ROW
Badami Sales Oil Pipeline ROW Lease
Endicott Pipeline ROW
Point Thomson Export Pipeline
Alaska Stand Alone Gas Pipeline ROW
Liberty Pipeline
AK LNG Point Thomson Transmission Line ROW
Hilcorp ROW
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AN ASRC ENERGY COMPANY
ROUTE A
Eastern Access Road Study
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9-1
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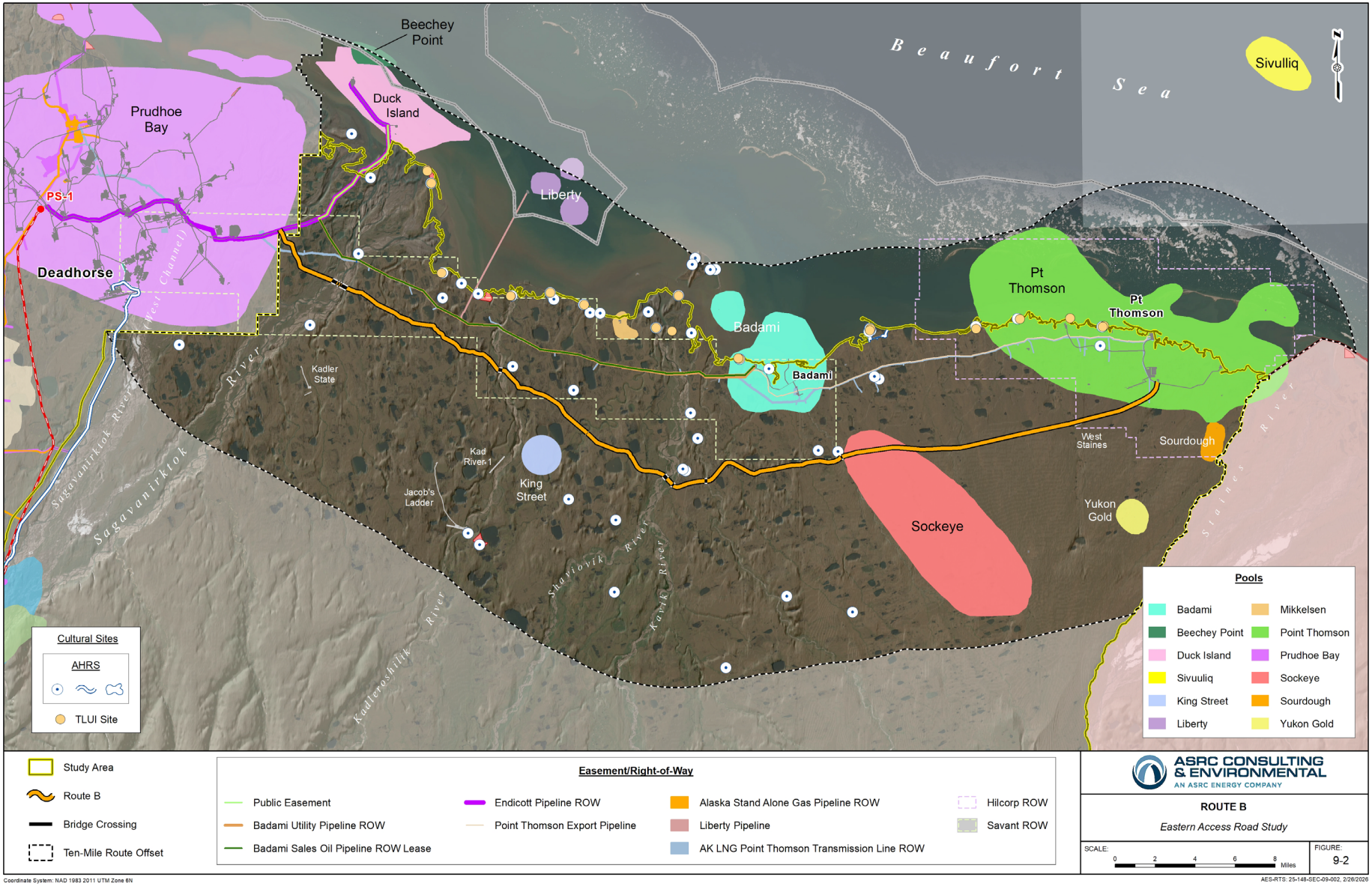
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Savant ROW
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
ROUTE B
Eastern Access Road Study
SCALE:
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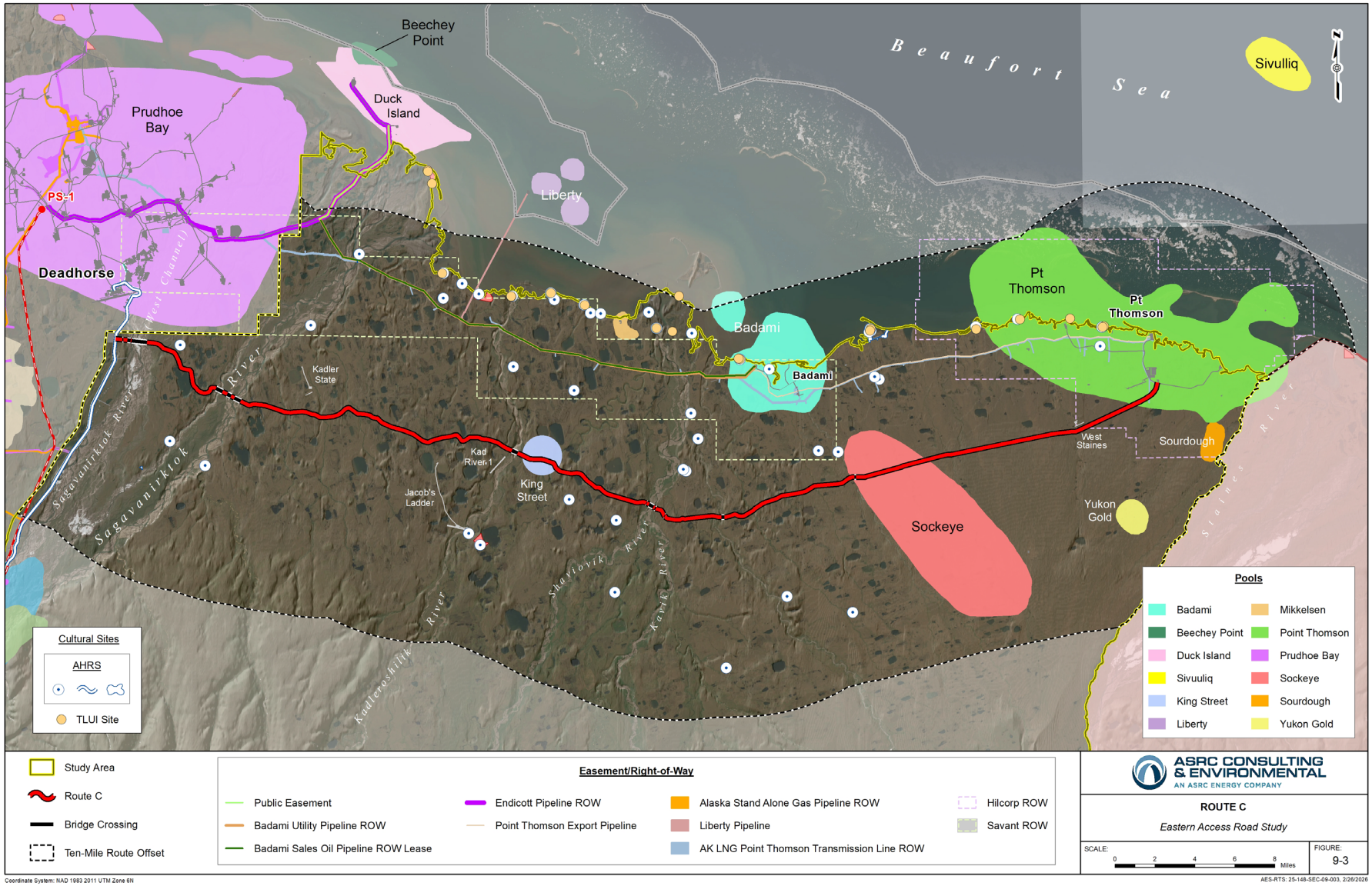
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Liberty Pipeline
AK LNG Point Thomson Transmission Line ROW
Hilcorp ROW
Savant ROW
ASRC CONSULTING & ENVIRONMENTAL
AN ASRC ENERGY COMPANY
ROUTE C
Eastern Access Road Study
SCALE:
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FIGURE:
9-3
Coordinate System: NAD 1983 2011 UTM Zone 6N
AES-RTS: 25-148-SEC-09-003, 2/26/2026

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10.0 SUMMARY AND NEXT STEPS

This section summarizes the key findings of the route alternatives analysis and identifies additional studies that would be required to advance the project.

10.1 Summary of Findings

This study evaluates three possible route alternatives for access to O&G resources on the eastern North Slope. The proposed routes are based on a review of existing literature, geospatial information, an inventory of known and potential O&G reserves, the identification of reasonable crossing locations of major rivers, and an analysis of benefits and constraints.

Based on currently available information, Routes A and B appear to be the most advantageous options. The difference in length between the two routes is only 0.6 miles, and both routes access nearly the same volume of O&G reserves and leases. Key distinguishing characteristics of the two routes are summarized below:

- **Route: A**: The alignment for Route A is closer to existing pipeline corridors, ROWs, and Badami infrastructure, facilitating better access for maintenance, inspection, and spill response.
- **Route B**: Route B exhibits the lowest construction cost, the fewest number of bridges, and the shortest total length of bridges.

Additional engineering, environmental, and economic studies would be required before identifying a preferred route between Routes A and B.

10.2 Identified Data Gaps and Next Steps

This desktop study provides a baseline for additional project development should the project move forward. Tasks required to advance the project include stakeholder engagement, further engineering refinement, environmental field studies, cost estimate refinement, and economic analysis.

Stakeholder Engagement. If this project moves forward, seeking stakeholder input will be a critical next step. Key stakeholders include local residents and affected land management agencies such as the State of Alaska, the NSB, ASRC, and O&G leaseholders.

Engineering Refinement. Preliminary engineering alignments were identified based on engineering judgment using available data. Additional environmental, geotechnical, hydrologic, and topographic data will need to be obtained to refine the alignments. This could include the following:

- Acquire light detection and ranging (LiDAR) and high-resolution imagery to provide a complete topographic dataset for the route corridor(s)

- Incorporate terrain unit mapping that will soon be published by DGGS to support route refinement
- Conduct geotechnical studies to identify and delineate gravel borrow sites and characterize subsurface conditions at major river crossings.
- Further evaluate connection points to existing roadways and pads
- Further evaluate crossings of existing aboveground pipelines (e.g., the Oliktok Pipeline)
- Further evaluate the existing bridge over the west channel of the Sagavanirktok River that may need to be upgraded or replaced to accommodate increased traffic.
- Conduct hydrology and hydraulics studies at major crossings to support design of bridges and culverts.

Environmental Studies. Several environmental and cultural resource studies are recommended to help refine the proposed routes and advance the project. At a minimum, these could include the following:

- Wetland delineation
- Fish-stream surveys and essential fish habitat
- Historic and cultural resources
- Lake studies (for construction water sources)
- Wildlife and sensitive species

Cost Estimate Refinement. As the alignments are further engineered, the cost estimates should be refined.

Economic Analysis. An economic analysis should be conducted to assess the costs and benefits of constructing the Eastern Access Road. This analysis could support the purpose and need for the project and would further refine the analysis of existing O&G resources within the study area. The analysis could also identify the lost value of resource extraction potential due to a lack of year-round transportation access.

These additional studies would provide the information necessary to refine route selection and support future decisions regarding development of year-round transportation access to O&G resources on the eastern North Slope.

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Appendix A
Wells within the Study Area

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Table A-1 Wells within the Study Area

Well Name	Operator	Current Classification	Current Status	Spud Date	Completion Date
DELTA ST 1	ARCO Alaska Inc.	Exploratory	Plugged & Abandoned	1968-12-09	1969-02-27
TOOLIK FED 1	Atlantic Richfield Company	Exploratory	Plugged & Abandoned	1969-01-13	1969-04-15
KADLER ST 15-09-16	Mobil Oil Corporation	Exploratory	Plugged & Abandoned	1969-05-07	1969-09-15
KAD RIV 1	Texaco Inc.	Exploratory	Plugged & Abandoned	1969-06-05	1969-09-24
LAKE 79 FED 1	Shell Oil Company	Exploratory	Plugged & Abandoned	1969-07-06	1969-10-22
MIKKELSEN BAY ST 13-09-19	Mobil Oil Corporation	Exploratory	Plugged & Abandoned	1970-02-20	1970-09-30
W CHANNEL 1-03	Ashland Oil Inc.	Exploratory	Plugged & Abandoned	1972-03-02	1972-04-23
FOGGY IS BAY STATE 1	Amoco Production Company	Exploratory	Plugged & Abandoned	1975-02-03	1975-04-26
FOGGY IS BAY STATE 1 RE-ENTRY	BP America Production Company	Exploratory	Plugged & Abandoned		2023-03-02
DELTA ST 2	Chevron USA Inc.	Exploratory	Plugged & Abandoned	1975-03-05	1975-05-17
W MIKKELSEN ST 1	ConocoPhillips Alaska, Inc.	Exploratory	Plugged & Abandoned	1978-04-05	1978-11-11
W MIKKELSEN UNIT 3	Shell Western E&P Inc.	Exploratory	Plugged & Abandoned	1980-12-26	1982-02-16
HEMI SPGS SAG RIV 1	H. G. & G. Inc.	Exploratory	Plugged & Abandoned	1984-01-17	1984-02-06
SAG DELTA 11	Sohio Alaska Petroleum Company	Development	Plugged & Abandoned	1985-01-09	1985-04-08
BADAMI 1	Savant Alaska LLC.	Exploratory	Plugged & Abandoned	1990-02-05	1990-04-27
ALPENGLOW STATE 1	Union Oil Company of California	Exploratory	Plugged & Abandoned	1992-01-06	1992-01-29
BADAMI 3XX	BP Exploration (Alaska) Inc.	Exploratory	Permit expired		
BADAMI UNIT B1-21	Cook Inlet Energy, LLC.	Development	Oil well, single completion	1997-11-20	1998-04-06
BADAMI UNIT B1-11A	Cook Inlet Energy, LLC.	Development	Oil well, single completion	1998-02-21	1998-03-02
BADAMI UNIT B1-18	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1998-03-06	1998-04-03
BADAMI UNIT B1-18A	Cook Inlet Energy, LLC.	Development	Oil well, single completion	2010-02-19	2010-03-11
BADAMI UNIT B1-14	Cook Inlet Energy, LLC.	Development	Gas well, single completion	1998-04-05	1998-08-05
BADAMI UNIT B1-15	Cook Inlet Energy, LLC.	Development	Oil well, single completion	1998-06-14	1998-07-28

Well Name	Operator	Current Classification	Current Status	Spud Date	Completion Date
BADAMI UNIT B1-15L1	Cook Inlet Energy, LLC.	Development	Oil well, single completion	1998-06-14	1998-07-28
BADAMI UNIT B1-15L2	Cook Inlet Energy, LLC.	Development	Oil well, single completion	1998-06-14	1998-07-28
BADAMI UNIT B1-16	Cook Inlet Energy, LLC.	Development	Oil well, single completion	1998-05-03	1998-08-09
BADAMI UNIT B1-28	Cook Inlet Energy, LLC.	Development	Oil well, single completion	1998-09-10	1998-10-18
BADAMI UNIT B1-28L1	Cook Inlet Energy, LLC.	Development	Oil well, single completion	1998-07-30	1998-10-18
BADAMI UNIT B1-28L2	Cook Inlet Energy, LLC.	Development	Oil well, single completion	1998-08-30	1998-10-18
BADAMI UNIT B1-25	Cook Inlet Energy, LLC.	Development	Oil well, single completion	1998-10-25	1998-11-21
BADAMI UNIT B1-25L1XX	BP Exploration (Alaska) Inc.	Development	Permit cancelled		
BADAMI UNIT B1-25L2XX	BP Exploration (Alaska) Inc.	Development	Permit cancelled		
BADAMI UNIT B1-23XX	BP Exploration (Alaska) Inc.	Development	Permit expired		
BADAMI UNIT B1-36	Cook Inlet Energy, LLC.	Development	Oil well, single completion	1998-11-23	1999-05-27
JACOB'S LADDER C	Anadarko Petroleum Corporation	Exploratory	Plugged & Abandoned	2007-02-17	2007-04-08
JACOB'S LADDER C-A	Anadarko Petroleum Corporation	Exploratory	Plugged & Abandoned	2008-02-16	2008-04-02
BADAMI UNIT B1-38	Cook Inlet Energy, LLC.	Exploratory	Oil well, single completion	2009-03-21	2010-02-09
BADAMI UNIT RED WOLF 2	Savant Alaska LLC.	Exploratory	Plugged & Abandoned	2012-04-03	2012-04-30
BADAMI B1-07	Cook Inlet Energy, LLC.	Exploratory	Oil well, single completion		2018-05-01
BADAMI B1-33PH	Cook Inlet Energy, LLC.	Exploratory	Plugged & Abandoned		2024-04-27
BADAMI B1-33	Cook Inlet Energy, LLC.	Exploratory	Plugged & Abandoned		2024-06-13
BADAMI B1-33A	Cook Inlet Energy, LLC.	Exploratory	Oil well, single completion		2024-09-11
VOODOO 1	Lagniappe Alaska, LLC	Exploratory	Plugged & Abandoned		2024-04-13
KING STREET 1	Lagniappe Alaska, LLC	Exploratory	Plugged & Abandoned		2024-04-13
W STAINES ST 18-09-23	Mobil Oil Corporation	Exploratory	Plugged & Abandoned	1970-02-08	1970-08-13
E MIKKELSEN BAY ST 1	Humble Oil and Refining	Exploratory	Plugged & Abandoned	1971-01-12	1971-06-16
W STAINES ST 2	Mobil Oil Corporation	Exploratory	Plugged & Abandoned	1975-03-08	1975-05-26
PT THOMSON UNIT 1	Exxon Corporation	Exploratory	Plugged & Abandoned	1977-03-06	1977-12-08
PT THOMSON UNIT 2	Exxon Corporation	Exploratory	Plugged & Abandoned	1978-02-04	1978-08-12

Well Name	Operator	Current Classification	Current Status	Spud Date	Completion Date
PT THOMSON UNIT 3	Exxon Corporation	Exploratory	Plugged & Abandoned	1979-01-03	1979-07-04
STAINES RIV ST 1	ExxonMobil Alaska Production Inc.	Exploratory	Plugged & Abandoned	1979-01-30	1979-07-21
PT THOMSON UNIT 4	Exxon Corporation	Exploratory	Plugged & Abandoned	1980-04-13	1980-12-20
ALASKA ST B 1XX	Exxon Corporation	Exploratory	Permit expired		
ALASKA ST C 1	Exxon Corporation	Exploratory	Plugged & Abandoned	1980-12-03	1981-07-14
PT THOMSON UNIT 6XX	Exxon Corporation	Exploratory	Permit expired		
P.T.UN.N.STAINES RV. 1	Phillips Petroleum Company	Exploratory	Plugged & Abandoned	1981-11-14	1982-05-06
E DE K LEFFINGWELL 1	Union Oil Company of California	Exploratory	Plugged & Abandoned	1984-02-25	1984-08-08
YUKON GOLD 1	BP Exploration (Alaska) Inc.	Exploratory	Plugged & Abandoned	1993-11-18	1994-01-29
SOURDOUGH 1XX	BP Exploration (Alaska) Inc.	Exploratory	Permit expired		
SOURDOUGH 2	BP Exploration (Alaska) Inc.	Exploratory	Plugged & Abandoned	1994-02-16	1994-04-27
SOURDOUGH 3	Hilcorp North Slope, LLC	Exploratory	Suspended well	1996-02-01	1996-04-24
RED DOG 1	BP Exploration (Alaska) Inc.	Exploratory	Plugged & Abandoned	1999-01-25	1999-04-02
PTU 16	Hilcorp Alaska, LLC	Exploratory	Gas injection, single completion	2010-07-29	2010-07-12
PTU 17	Hilcorp Alaska, LLC	Development	Oil well, single completion	2015-10-18	2016-02-24
SOCKEYE 1	Lagniappe Alaska, LLC	Exploratory	Plugged & Abandoned		2024-04-13
KAVIK 1	ARCO Alaska Inc.	Exploratory	Plugged & Abandoned	1969-02-05	1969-11-05
BELI UNIT 1	Mobil Oil Corporation	Exploratory	Plugged & Abandoned	1973-01-20	1973-06-24
KAVIK UNIT 2	ARCO Alaska Inc.	Exploratory	Plugged & Abandoned	1973-02-14	1973-04-24
KAVIK UNIT 3	ARCO Alaska Inc.	Development	Plugged & Abandoned	1974-02-04	1974-05-02
CANNING RIV U BLK A 1	U.S. Dept of Interior	Exploratory	Plugged & Abandoned	1974-03-22	1974-07-07
CANNING RIV UNIT B-1	Exxon Corporation	Exploratory	Plugged & Abandoned	1974-12-29	1975-04-22
ALASKA ST J 1	Exxon Corporation	Exploratory	Plugged & Abandoned	1984-03-27	1984-06-14
ALASKA ST K 1XX	Exxon Corporation	Exploratory	Permit expired		
SHAVIOVIK UNIT 1	Colorado Oil & Gas	Exploratory	Plugged & Abandoned	1969-01-26	1969-07-04

Well Name	Operator	Current Classification	Current Status	Spud Date	Completion Date
W KAVIK UNIT 1	Texaco Inc.	Exploratory	Plugged & Abandoned	1969-02-08	1970-01-13
W KADLEROSHILIK U 1	Mobil Oil Corporation	Exploratory	Plugged & Abandoned	1974-01-24	1974-02-21
GYR 1	ConocoPhillips Alaska, Inc.	Exploratory	Plugged & Abandoned	1990-02-25	1990-04-03
FRANKLIN BLUFFS NO. 1	U.S. Dept of Interior	Exploratory	Plugged & Abandoned	2005-07-17	2005-08-07
ALCOR 1	Great Bear Petroleum Operating LLC	Exploratory	Plugged & Abandoned	2012-06-19	2012-08-11
MERAK 1	Great Bear Petroleum Operating LLC	Exploratory	Plugged & Abandoned	2012-08-22	2012-10-16
ICEWINE 1	Accumulate Energy Alaska, Inc.	Exploratory	Plugged & Abandoned	2015-10-22	2016-01-02
ICEWINE 2	Accumulate Energy Alaska, Inc.	Exploratory	Plugged & Abandoned	2017-04-22	2017-06-18
ALKAID 2 PH	Great Bear Pantheon, LLC	Exploratory	Plugged & Abandoned	2022-07-06	2022-08-04
ALKAID 2	Great Bear Pantheon, LLC	Exploratory	Oil well, single completion	2022-07-06	2022-10-05
HICKORY 1	Accumulate Energy Alaska, Inc.	Exploratory	Plugged & Abandoned		2023-04-28
SAG DELTA 03	BP Exploration (Alaska) Inc.	Exploratory	Plugged & Abandoned	1977-01-23	1977-03-23
SAG DELTA 34633 04	BP Exploration (Alaska) Inc.	Exploratory	Plugged & Abandoned	1977-03-30	1978-03-22
DUCK IS UNIT 1	Exxon Corporation	Exploratory	Plugged & Abandoned	1978-10-23	1979-03-29
DUCK IS UNIT 2	Exxon Corporation	Exploratory	Plugged & Abandoned	1979-09-25	1980-01-22
DUCK IS UNIT 3	Exxon Corporation	Exploratory	Plugged & Abandoned	1981-03-01	1981-12-16
SAG DELTA 08	BP Exploration (Alaska) Inc.	Exploratory	Plugged & Abandoned	1981-01-25	1981-04-15
DUCK IS UNIT MPI 2-04	Hilcorp Alaska, LLC	Development	Oil well, single completion	1986-04-29	1986-07-31
DUCK IS UNIT SDI 3-27	Hilcorp Alaska, LLC	Development	Oil well, single completion	1986-06-04	1986-07-08
DUCK IS UNIT SDI 3-05	Hilcorp Alaska, LLC	Development	Oil well, single completion	1986-07-09	1986-08-19
DUCK IS UNIT MPI 1-47	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1986-07-10	1987-07-18
DUCK IS UNIT MPI 1-47A	Hilcorp Alaska, LLC	Development	Oil well, single completion	1997-11-20	1998-01-24
DUCK IS UNIT MPI 2-14	Hilcorp Alaska, LLC	Development	Oil well, single completion	1986-08-09	1986-09-19

Well Name	Operator	Current Classification	Current Status	Spud Date	Completion Date
DUCK IS UNIT SDI 4-20	Standard Alaska Production Company	Development	Plugged & Abandoned	1986-09-17	1986-10-13
DUCK IS UNIT SDI 4-20A	Hilcorp Alaska, LLC	Development	Oil well, single completion	1986-10-14	1987-09-03
DUCK IS UNIT SDI 3-23	Hilcorp Alaska, LLC	Development	Plugged & Abandoned	1986-08-20	1986-09-16
DUCK IS UNIT SDI 3-23A	Hilcorp Alaska, LLC	Development	Oil well, single completion	2017-08-25	2017-10-10
DUCK IS UNIT MPI 2-62	Hilcorp Alaska, LLC	Development	Oil well, single completion	1986-09-20	1987-07-15
DUCK IS UNIT SDI 3-33	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1986-11-17	1987-08-22
DUCK IS UNIT SDI 3-33A	Hilcorp Alaska, LLC	Development	Oil well, single completion	2004-02-02	2004-02-21
DUCK IS UNIT MPI 1-29	Hilcorp Alaska, LLC	Development	Oil well, single completion	1986-11-11	1987-08-01
DUCK IS UNIT MPI 1-35	Hilcorp Alaska, LLC	Development	Oil well, single completion	1986-12-30	1987-07-26
DUCK IS UNIT MPI 1-27	Hilcorp Alaska, LLC	Development	Oil well, single completion	1987-02-02	1987-08-05
DUCK IS UNIT SDI 3-21	Hilcorp Alaska, LLC	Development	Oil well, single completion	1987-04-01	1987-08-25
DUCK IS UNIT SDI 3-21AXX	BP Exploration (Alaska) Inc.	Development	Permit expired		
DUCK IS UNIT MPI 1-25	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1987-04-30	1987-07-02
DUCK IS UNIT MPI 1-25A	Hilcorp Alaska, LLC	Development	Oil well, single completion	1997-04-18	1997-05-24
DUCK IS UNIT SDI 4-06	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1987-05-01	1987-09-17
DUCK IS UNIT SDI 4-06A	Hilcorp Alaska, LLC	Development	Oil well, single completion	1996-11-13	1996-12-04
DUCK IS UNIT SDI 3-49	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1987-06-22	1987-09-13
DUCK IS UNIT SDI 3-49AXX	BP Exploration (Alaska) Inc.	Development	Permit cancelled		
DUCK IS UNIT MPI 1-09	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1987-08-10	1987-09-11
DUCK IS UNIT MPI 2-52	Hilcorp Alaska, LLC	Development	Oil well, single completion	1987-09-12	1987-10-18
DUCK IS UNIT SDI 3-15	Hilcorp Alaska, LLC	Development	Oil well, single completion	1987-09-25	1987-12-03
DUCK IS UNIT SDI 3-39	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1987-12-04	1988-06-05
DUCK IS UNIT SDI 3-39A	Hilcorp Alaska, LLC	Development	Oil well, single completion	1997-05-28	1997-06-26

Well Name	Operator	Current Classification	Current Status	Spud Date	Completion Date
DUCK IS UNIT MPI 2-44A	Hilcorp Alaska, LLC	Development	Oil well, single completion	1997-10-09	1997-12-06
DUCK IS UNIT MPI 2-08	Hilcorp Alaska, LLC	Development	Oil well, single completion	1988-01-23	1988-02-22
DUCK IS UNIT SDI 3-09	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1988-01-17	1988-03-15
DUCK IS UNIT SDI 3-09A	Hilcorp Alaska, LLC	Development	Oil well, single completion	1995-03-10	1995-05-08
DUCK IS UNIT MPI 1-55	Hilcorp Alaska, LLC	Development	Oil well, single completion	1988-03-14	1988-04-23
DUCK IS UNIT SDI 4-02	Hilcorp Alaska, LLC	Development	Oil well, single completion	1988-03-16	1988-04-22
DUCK IS UNIT MPI 1-01	Hilcorp Alaska, LLC	Development	Oil well, single completion	1988-04-24	1988-05-18
DUCK IS UNIT MPI 1-39	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1988-06-18	1988-08-19
DUCK IS UNIT MPI 1-39A	Hilcorp Alaska, LLC	Development	Oil well, single completion	2007-03-26	2007-04-17
DUCK IS UNIT SDI 4-26	Hilcorp Alaska, LLC	Development	Plugged & Abandoned	1988-07-09	1988-08-04
DUCK IS UNIT MPI 1-49	Hilcorp Alaska, LLC	Development	Oil well, single completion	1988-07-11	1988-09-10
DUCK IS UNIT MPI 2-28	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1988-07-31	1988-09-23
DUCK IS UNIT MPI 2-28A	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	2001-02-27	2001-03-14
DUCK IS UNIT MPI 2-28B	Hilcorp Alaska, LLC	Development	Oil well, single completion	2003-03-25	2003-04-12
DUCK IS UNIT SDI 3-11	Hilcorp Alaska, LLC	Development	Oil well, single completion	1988-08-07	1988-09-10
DUCK IS UNIT MPI 2-68	Hilcorp Alaska, LLC	Development	Oil well, single completion	1988-08-22	1988-10-27
DUCK IS UNIT SDI 4-14A	Hilcorp Alaska, LLC	Development	Oil well, single completion	2008-02-14	2008-03-25
DUCK IS UNIT SDI 4-28	Hilcorp Alaska, LLC	Development	Oil well, single completion	1988-10-08	1988-11-07
DUCK IS UNIT MPI 1-57	Hilcorp Alaska, LLC	Development	Oil well, single completion	1988-10-19	1988-10-27
DUCK IS UNIT MPI 2-16	Hilcorp Alaska, LLC	Development	Oil well, single completion	1988-11-11	1988-12-04
DUCK IS UNIT MPI 2-42	Hilcorp Alaska, LLC	Development	Oil well, single completion	1988-12-04	1988-12-31
DUCK IS UNIT SDI 4-18	Hilcorp Alaska, LLC	Development	Oil well, single completion	1989-01-10	1989-02-06
DUCK IS UNIT MPI 1-63	Hilcorp Alaska, LLC	Development	Oil well, single completion	1989-01-27	1989-02-27

Well Name	Operator	Current Classification	Current Status	Spud Date	Completion Date
DUCK IS UNIT SDI 3-07A	Hilcorp Alaska, LLC	Development	Oil well, single completion	1998-08-29	1998-09-15
DUCK IS UNIT MPI 2-46	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1989-03-01	1989-03-24
DUCK IS UNIT MPI 2-46A	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1996-12-09	1997-01-28
DUCK IS UNIT MPI 2-46B	Hilcorp Alaska, LLC	Development	Oil well, single completion	1997-08-27	1997-09-28
DUCK IS UNIT SDI 4-50	Hilcorp Alaska, LLC	Development	Oil well, single completion	1989-04-20	1989-06-05
DUCK IS UNIT SDI 3-17	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1989-06-06	1989-07-04
DUCK IS UNIT SDI 3-17A	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1994-03-19	1994-04-22
DUCK IS UNIT SDI 3-17B	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1997-06-16	1997-07-09
DUCK IS UNIT SDI 3-17C	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1998-06-08	1998-06-27
DUCK IS UNIT SDI 3-17D	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1998-09-25	1998-10-20
DUCK IS UNIT SDI 3-17E	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	2003-03-04	2003-03-22
DUCK IS UNIT SDI 3-17F	Hilcorp Alaska, LLC	Development	Oil well, single completion	2004-02-26	2004-03-13
DUCK IS UNIT SDI 4-46	Hilcorp Alaska, LLC	Development	Oil well, single completion	1989-07-22	1989-08-14
DUCK IS UNIT MPI 1-45	Hilcorp Alaska, LLC	Development	Oil well, single completion	1989-12-13	1990-02-26
DUCK IS UNIT MPI 2-36	Hilcorp Alaska, LLC	Development	Oil well, single completion	1990-02-08	1990-05-04
DUCK IS UNIT MPI 2-18	Hilcorp Alaska, LLC	Development	Oil well, single completion	1990-04-02	1990-07-26
DUCK IS UNIT MPI 2-58	Hilcorp Alaska, LLC	Development	Oil well, single completion	1990-04-22	1990-06-11
DUCK IS UNIT MPI 2-20	Hilcorp Alaska, LLC	Development	Oil well, single completion	1990-06-11	1990-07-06
DUCK IS UNIT MPI 2-66XX	BP Exploration (Alaska) Inc.	Development	Permit cancelled		
DUCK IS UNIT MPI 2-32	Hilcorp Alaska, LLC	Development	Oil well, single completion	1990-08-30	1990-11-05
DUCK IS UNIT MPI 2-38	Hilcorp Alaska, LLC	Development	Oil well, single completion	1990-10-04	1990-11-07
DUCK IS UNIT MPI 1-17	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1990-11-04	1990-12-11
DUCK IS UNIT MPI 1-17A	Hilcorp Alaska, LLC	Development	Oil well, single completion	1997-02-11	1997-03-05

Well Name	Operator	Current Classification	Current Status	Spud Date	Completion Date
DUCK IS UNIT SDI 3-29	Hilcorp Alaska, LLC	Development	Oil well, single completion	1990-12-12	1991-02-26
SAG DELTA 12XX	BP Exploration (Alaska) Inc.	Exploratory	Permit expired		
DUCK IS UNIT SDI 3-25	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1991-01-06	1991-02-18
DUCK IS UNIT SDI 3-25A	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	2001-04-03	2001-04-22
DUCK IS UNIT SDI 3-25B	Hilcorp Alaska, LLC	Development	Oil well, single completion	2003-04-13	2003-04-29
DUCK IS UNIT MPI 2-30A	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1998-10-26	1999-01-19
DUCK IS UNIT MPI 2-30B	Hilcorp Alaska, LLC	Development	Oil well, single completion	2009-02-26	2009-04-04
DUCK IS UNIT SDI 4-44AXX	BP Exploration (Alaska) Inc.	Development	Permit cancelled		
DUCK IS UNIT SDI 3-03	Hilcorp Alaska, LLC	Development	Oil well, single completion	1993-01-07	1993-03-19
DUCK IS UNIT MPI 2-66A	Hilcorp Alaska, LLC	Development	Oil well, single completion	2018-09-19	2018-10-07
DUCK IS UNIT MPI 2-60	Hilcorp Alaska, LLC	Development	Oil well, single completion	1994-01-01	1994-01-31
DUCK IS UNIT SDI 4-10	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1994-06-27	1994-07-26
DUCK IS UNIT SDI 4-10A	Hilcorp Alaska, LLC	Development	Oil well, single completion	2003-02-04	2003-02-28
DUCK IS UNIT SDI 4-38	Hilcorp Alaska, LLC	Development	Oil well, single completion	1994-05-30	1994-07-04
DUCK IS UNIT MPI 1-53	Hilcorp Alaska, LLC	Development	Suspended well	1994-09-12	1994-09-30
DUCK IS UNIT MPI 1-61	Hilcorp Alaska, LLC	Development	Oil well, single completion	1994-11-13	1994-12-16
DUCK IS UNIT MPI 2-40	Hilcorp Alaska, LLC	Development	Oil well, single completion	1995-01-04	1995-02-10
DUCK IS UNIT SDI 3-37	Hilcorp Alaska, LLC	Development	Oil well, single completion	1995-04-30	1995-05-30
DUCK IS UNIT SDI 4-32	Hilcorp Alaska, LLC	Development	Oil well, single completion	1995-06-11	1995-07-19
DUCK IS UNIT MPI 1-31	Hilcorp Alaska, LLC	Development	Oil well, single completion	1995-05-22	1995-06-16
DUCK IS UNIT MPI 1-19	Hilcorp Alaska, LLC	Development	Oil well, single completion	1995-07-19	1995-08-17
DUCK IS UNIT MPI 1-33	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1995-09-02	1995-10-04
DUCK IS UNIT MPI 1-33A	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1998-07-31	1998-08-24

Well Name	Operator	Current Classification	Current Status	Spud Date	Completion Date
DUCK IS UNIT MPI 1-33B	Hilcorp Alaska, LLC	Development	Oil well, single completion	1999-01-27	1999-02-18
DUCK IS UNIT MPI 1-33CXX	BP Exploration (Alaska) Inc.	Development	Permit expired		
DUCK IS UNIT MPI 1-03	Hilcorp Alaska, LLC	Development	Oil well, single completion	1995-09-03	1995-11-06
DUCK IS UNIT MPI 2-48	Hilcorp Alaska, LLC	Development	Oil well, single completion	1995-11-07	1995-12-12
DUCK IS UNIT MPI 1-65	BP Exploration (Alaska) Inc.	Development	Plugged & Abandoned	1995-12-13	1996-01-26
DUCK IS UNIT MPI 1-65A	Hilcorp Alaska, LLC	Development	Oil well, single completion	2004-03-17	2004-04-25
DUCK IS UNIT MPI 1-59	Hilcorp Alaska, LLC	Development	Suspended well	1996-02-03	1996-02-21
DUCK IS UNIT SDI 4-34	Hilcorp Alaska, LLC	Development	Oil well, single completion	1996-09-20	1996-11-07
DUCK IS UNIT SDI 3-31	Hilcorp Alaska, LLC	Development	Oil well, single completion	1998-01-17	1998-02-20
DUCK IS UNIT MPI 2-56	BP Exploration (Alaska) Inc.	Exploratory	Plugged & Abandoned	1998-02-18	1998-03-20
DUCK IS UNIT MPI 2-56A	Hilcorp Alaska, LLC	Development	Oil well, single completion	1998-03-21	1998-05-28
DUCK IS UNIT MPI 2-72	Hilcorp Alaska, LLC	Development	Oil well, single completion	2024-03-07	2024-06-28
DUCK IS UNIT MPI 2-74	Hilcorp Alaska, LLC	Development	Oil well, single completion	2024-04-26	2024-06-07
OCS Y-0195 TERN 1	Shell Western E&P Inc.	Exploratory	Plugged & Abandoned	1982-05-28	1982-09-24
OCS Y-0196 TERN 2	Shell Oil Company	Exploratory	Plugged & Abandoned	1982-10-16	1983-03-03
OCS Y-0197 TERN 3	Shell Western E&P Inc.	Exploratory	Plugged & Abandoned	1987-02-10	1987-05-10
OCS Y-1650 LIBERTY 1	BP Exploration (Alaska) Inc.	Exploratory	Plugged & Abandoned	1997-02-07	1997-03-30

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Appendix B
North Slope Area Plan Units within the Study Area

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Table B-1 North Slope Area Plan Units within the Study Area

Unit No.	Name	Designation(s)	Management Intent	Resources and Uses
A-05	Prudhoe Bay	Ha/Og	The unit is to be managed for its habitat and O&G resource values. All development must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate negative impacts. Also maintain opportunities for material sale/extraction in the area.	This unit covers the state-owned lands and waters and tide and submerged lands from the east bank of the Putuligayuk River to the east bank of the Sagavanirktok River. Its southern extent conforms to the region boundary and extends north to Prudhoe Bay in the Beaufort Sea. This unit is heavily developed and serves as the main area supporting O&G development in the region. This unit is covered by the Prudhoe Bay DOG lease sale unit. Major O&G drill pads, processing facilities, airstrips, and support facilities are located in this unit. Trans-Alaska Pipeline System (TAPS) collection point and Pump Station 1 are located in this unit. The proposed ROW for a natural gas pipeline also exists in the unit (ASAP line ADL 418997). A portion of the Alaska LNG proposed ROW exists within this unit.
A-06	Badami	Ha/Og	The unit is to be managed for its habitat and O&G resource values. All development must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate negative impacts. Also maintain opportunities for material sale/extraction in the area.	This unit covers the state-owned lands and waters and tide and submerged lands from the west bank of the Sagavanirktok River to the eastern edges of sections 20, 16, 9 and 4 within U009N021E. Its southern extent conforms to the region boundary and extends north to the shore of the Arctic Ocean. Vegetation is generally wet and shrub tundra, tussocks, and tidal marsh. Most of this unit is covered by the Badami DOG lease sale unit. Development is limited to roads connecting the Badami drill site and processing facility and work camp, with a pipeline connecting to TAPS. A portion of the AKLNG proposed ROW exists within this unit.

Unit No.	Name	Designation(s)	Management Intent	Resources and Uses
A-07	Point Thomson	Ha/Og	The unit is to be managed for its habitat and O&G resource values. All development must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate negative impacts. Also maintain opportunities for material sale/extraction in the area.	This unit covers the state-owned lands and waters and tide and submerged lands from the western edges of sections 20, 16, 9 and 4 within U009N021E, to the eastern edges of sections 2, 11, and 14 of U009N023E. Its southern extent conforms to the region boundary and extends north to the shore of the Arctic Ocean. The terrain is flat, and vegetation is generally shrub tundra, tussocks, and freshwater marsh. This unit is covered by the Point Thomson DOG lease sale unit. Several drill sites and related facilities exist, three of which are connected by gravel roads, which also connect the Point Thomson airstrip to the south. Numerous pipelines from these facilities are proposed. When needed, an ice road or snow road may connect this unit to the gravel road system in Prudhoe Bay in winter. The Point Thomson Export Pipeline (PTEP) extends about 22 miles from the Point Thomson Central Pad (CP) to a point of connection with the existing Badami Sales Oil Pipeline. A portion of the AKLNG proposed ROW exists within this unit.
A-08	Canning River	Ha/Og	The unit is to be managed for its habitat and O&G resource values. All development must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate negative impacts. Also maintain opportunities for material sale/extraction in the area.	This remote unit covers the state-owned lands and waters and tide and submerged lands comprised of the lands west of the Canning River and includes the Staines River and adjacent lands. The eastern extent conforms to the ANWR boundary at the Canning River while its western extent conforms to the western edges of sections 2, 11, and 14 of U009N023E. Its southern extent conforms to the region boundary and extends north to the shore of the Arctic Ocean. The terrain is flat, and vegetation is generally wet and shrub tundra, and tidal marsh. Numerous O&G leases exist in the unit, and its boundary takes in the eastern upland portion of the Point Thomson O&G leasing unit. Active exploration occurs in this unit and there are some drill sites scattered throughout the unit, but very little permanent infrastructure exists. There is a proposed pipeline connecting the North Staines drill pad to the Point Thomson facility.

Unit No.	Name	Designation(s)	Management Intent	Resources and Uses
A-11	Point Thomson Airstrip	Rm	Lands in this unit will be managed to facilitate O&G operations at Point Thomson. These lands have been identified for potential future selection by the NSB and may be appropriate for conveyance based on a future decision.	Located on the eastern end of the Point Thomson runway, this unit lies on flat terrain typical for the area. It lies south of an existing designated material site (Unit A-23). Roads, pipelines, and facilities related to O&G development and exploration are present. The unit has moderate sand and gravel materials potential.
A-23	Material Site	Ma	Lands shall be managed to continue to provide material resources for use in the maintenance and development operations and use in communities on the North Slope.	This unit is comprised of 13 subunits dispersed across the Arctic Coast Region. All of the subunits are designated material sites authorized by ADNR under multiple ADLs. A portion of the AKLNG proposed ROW exists within three of the subunits.
C-10	Kadleroshilik River	Ha/Og	Manage to maintain the caribou calving and musk ox concentration habitat and O&G maintenance and development activities. Oil and gas leasing/development may occur, but must consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate any potential negative effects.	This relatively large unit is centered on the core caribou calving area east of the Sagavanirktok River. The Kadleroshilik River bisects the eastern portion of the unit. Terrain is generally flat in the northern portion and rises to bluffs in the south. The vegetation is generally wet meadow with some areas of tussock and shrub tundra.
C-11	Eastern Range	Rm	Manage unit for multiple uses to continue to provide opportunities for subsistence, hunting, fishing, material sales, among other beneficial public uses. Oil and gas leasing/development may occur during the term of this plan, but must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate any potential negative effects.	This large unit comprises a large area of state-owned lands and waters immediately east of the Dalton Highway Region and extends to the Kavik River. The terrain is generally flat with small undulations in topography and some small, scattered lakes. Vegetation is a mixture of tussock tundra, willow/alder shrublands, and wet meadow.

Unit No.	Name	Designation(s)	Management Intent	Resources and Uses
C-12	Ivishak River	Ha	Manage for habitat values and preservation of water quality. Maintain opportunities for recreation. Oil and gas leasing/development may occur, but must consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate any potential negative effects.	This unit is comprised of state-owned lands and waters within river valleys in the middle reaches of the Echooka and Ivishak River drainages. Its western extent is adjacent to the Dalton Highway Region's eastern boundary. Its northern extent is located just south of Franklin Bluffs and its southern extent conforms to the region boundary at Lupine River. The terrain consists of rugged foothills between the Sagavanirktok and Ivishak rivers in the south and the gentle, flattening slopes of the Arctic Plain to the north. Vegetation is primarily comprised of tussock tundra and willow/alder shrublands in the uplands, with barren alluvial outwash typical of alpine river drainages in the region.
C-13	Kavik River	Ha	Manage for habitat values and preservation of water quality. Maintain opportunities for recreation. Oil and gas leasing/development may occur, but must consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate any potential negative effects. Consult with the ADF&G and USFWS prior to authorization issuance.	This large unit is comprised of state-owned lands and waters within river valleys in the upper reaches of the Kavik and Canning rivers. Its northernmost extent conforms to the region boundary near the Staines River. Its southern extent conforms to the region boundary at the edge of the Brooks Range. The Canning River forms its eastern boundary. The terrain consists of high plateaus over river valleys, glacial moraines and alluvial outwash from the Brooks Range. Vegetation is primarily comprised of tussock tundra and willow/alder shrublands in the uplands, with barren alluvial outwash typical of alpine river drainages in the region.

Unit No.	Name	Designation(s)	Management Intent	Resources and Uses
C-15	Canning Selections	Rm	Manage unit for multiple uses to continue to provide opportunities for subsistence, hunting, fishing, material sales, among other beneficial public uses. Lands within this unit may be appropriate for conveyance to the NSB through a subsequent entitlement decision. If a parcel within this unit is not conveyed to the NSB as part of its municipal entitlement, it will be incorporated into the adjacent unit and will be retained in state ownership. Oil and gas leasing/development may occur during the term of this plan, but must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate any potential negative effects. Consult with the ADF&G and USFWS prior to authorization issuance.	Unit is situated on middle section of the Canning River. The terrain climbs in elevation from north to south. Musk ox are present with concentrations occurring along the Canning River valley. Caribou are present throughout the unit with caribou calving indicated. Brown and polar bears are present with polar bear denning habitat indicated in the northern areas of the unit. Brown bears are present throughout. Migratory waterfowl are present during summer months. Peregrine falcon and gyrfalcon nesting and non-breeding golden eagle habitat is present. Riparian shrub habitat is important for breeding passerines. Gray-headed chickadee habitat is present within poplar groves. The Kavik and Canning rivers are anadromous.
C-19	Kavik Confluence Selection	Ha/Og	Manage to maintain the caribou calving and polar bear denning habitats and O&G maintenance and development activities. Lands within this unit have been selected or identified by the NSB as potential municipal entitlement selections. If a subsequent municipal entitlement decision determines that it is otherwise appropriate to convey state land to the borough, then the Ha/Og designations are extinguished and replaced by Rm designation that converts to a conveyable classification. This action affects only the area of the municipal entitlement selection.	Unit is located at the confluence of the Shavioivik and Kavik rivers. The terrain is flat with many old channels and wetlands. The NSB has an existing selection on lands in the southern portion of the unit with the remaining lands identified as potential municipal selection lands.
C-20	Kavik Camp Potential Selection	Rm	Manage unit for multiple uses to continue to provide opportunities for subsistence, hunting, fishing, material sales, among other beneficial public uses.	This unit consists of lands that span the upper Kavik River that have been identified as potential municipal entitlement selections by the NSB. Kavik Camp and associated airstrip are located on these lands.
C-21	Cache One Lake Settlement Unit	Se	Land disposal is appropriate within this unit. Manage the unit for multiple resources and uses with an emphasis on protecting wildlife habitat and anadromous stream values.	Lands in this unit have been identified as a potential settlement area for disposal through the state land sales program. This unit is within unit C-12 and is made up of the uplands along the Echooka River. The Arctic National Wildlife Refuge (ANWR) borders this unit to the east.

Unit No.	Name	Designation(s)	Management Intent	Resources and Uses
D-01	Dalton Highway Corridor	Ha/Rd/Tc	Manage the unit as a utility and transportation corridor to facilitate transportation of O&G resources from the North Slope to facilities in other areas of the state and to support subsistence hunting, fishing and gathering, recreation, and sport hunting opportunities. Linear transportation and infrastructure projects are appropriate within the unit.	This unit is comprised of state-owned, state-selected, and top filed lands, shorelands and waters within the Dalton Highway Corridor. The unit conforms to a 5-mile buffer on either side of center line of the highway. These lands are the most accessible and heavily used by residents and visitors to this area. The terrain varies from rugged mountain passes in the south, giving way to foothills of the Brooks Range to gently sloping hills and flat expanses to the north. Vegetation is generally tussock tundra, alder/willow shrublands.
D-07	Atigun-Sag River	Ha/Ma/Rd	Manage unit to protect wildlife habitat and subsistence values, water quality, material resources, and public recreation opportunities.	This river corridor unit is comprised of the Sagavanirktok River and the Atigun River in the south. Riparian vegetation consists of freshwater marshes, wet meadows, tussock tundra with dispersed shrubs.
D-11	Last Chance Wayside	Ha/Pr/Rd	Manage unit for its material values and resources consistent with the authorization issued by ADNR. ADNR shall consult ADF&G regarding authorizations involving uses that may impact musk ox concentrations.	This unit is within unit D-12 and is comprised of state lands that function as a material site and as a rest stop along the Dalton Highway. The terrain is gently sloping, and the uplands consist of tussock tundra and alder and willow in the small drainage areas.
D-12	Material Sites	Ha/Ma	Manage unit for its material values and resources consistent with the authorization issued by ADNR. ADNR shall consult ADF&G regarding authorizations involving uses that may impact musk ox concentrations and caribou calving and moose wintering habitat.	This unit consists of 32 subunits located on state-owned or top filed lands containing material sources within or near the Dalton Highway. Some sites may be open and active, or they may be closed and inactive. Usage at any one of these sites varies by demand. Tracts of land within the unit have been selected for municipal entitlement or identified as having potential for selection by the NSB.
D-13	Pump Stations	Ha/Pr	Manage the unit for TAPS operation and maintenance. Other uses within unit are restricted. ADNR shall consult ADF&G regarding authorizations involving uses that may impact moose wintering habitat.	This unit is comprised of lands that includes TAPS Pump Station No. 2, near Dalton Highway milepost 360, Pump Station No. 3, situated on state-owned land, at Dalton Highway Milepost 313 and Pump Station No. 4, situated on federal land managed by BLM that has been top filed by the state, at Milepost 270, and their associated access roads.

Unit No.	Name	Designation(s)	Management Intent	Resources and Uses
D-17	Potential Borough Selections	Ha/Tc	Manage this unit to maintain transportation and pipeline development. Authorizations must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate any potential negative effects. ADNR shall consult ADF&G regarding authorizations involving uses that may impact musk ox concentrations.	This unit is comprised of lands that have been selected by the NSB as having potential for conveyance under its municipal entitlement.
D-18	Potential Borough Selections	Ha/Tc	Manage this unit to maintain transportation and pipeline development. Authorizations must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate any potential negative effects. ADNR shall consult ADF&G regarding authorizations involving uses that may impact musk ox concentrations.	This unit is comprised of lands that have been selected by the NSB as having potential for conveyance under its municipal entitlement.
D-19	Potential Borough Selections	Ha/Tc	Manage this unit to maintain transportation and pipeline development. Authorizations must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate any potential negative effects. ADNR shall consult ADF&G regarding authorizations involving uses that may impact musk ox concentrations.	This unit is comprised of lands that have been selected by the NSB as having potential for conveyance under its municipal entitlement.
D-20	Potential Borough Selections	Ha/Tc	Manage this unit to maintain transportation and pipeline development. Authorizations must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate any potential negative effects. ADNR shall consult ADF&G regarding authorizations involving uses that may impact musk ox concentrations.	This unit is comprised of lands that have been selected by the NSB as having potential for conveyance under its municipal entitlement.

Unit No.	Name	Designation(s)	Management Intent	Resources and Uses
D-21	Potential Borough Selections	Ha/Tc	Manage this unit to maintain transportation and pipeline development. Authorizations must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate any potential negative effects. ADNR shall consult ADF&G regarding authorizations involving uses that may impact musk ox concentrations.	This unit is comprised of lands that have been selected by the NSB as having potential for conveyance under its municipal entitlement.
D-22	Potential Borough Selections	Ha/Tc	Manage this unit to maintain transportation and pipeline development. Authorizations must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, or mitigate any potential negative effects. ADNR shall consult ADF&G regarding authorizations involving uses that may impact musk ox concentrations.	This unit is comprised of lands that have been selected by the NSB as having potential for conveyance under its municipal entitlement.
T-05	Prudhoe Bay Coast	Ha/Og	Manage the unit to continue O&G development while minimizing the impact to fish and wildlife habitat values and harvest opportunities. Decisions related to O&G leasing/development shall consider potential impacts on the habitat and harvest values and include stipulations/conditions/measures that will avoid, minimize, or mitigate potential negative effects.	This large tideland unit covers the state-owned tide and submerged lands out three miles seaward from mean low water from western edge of the Colville River Delta to the mouth of the Staines River and covers over 100 linear miles of the central Beaufort Sea coastal region. Open ocean near shore areas typically occurs from late summer to fall, and sea ice is dominant during spring and winter. The unit is adjacent to the boundaries of federally managed NPR-A and ANWR. Tracts of land within the unit are selected for municipal entitlement by the NSB, and other lands within the unit have been identified as having potential for selection in the future.
T-07	Islands	Ha/Hv	Unit is to be managed to protect habitats for waterfowl, shorebird and seabird habitats, and polar bear denning areas. Islands are used extensively for subsistence purposes. Exploration and development of O&G resources is appropriate, but typically occurs adjacent to the islands.	This unit is comprised of the many islands that have been selected by the NSB within the Arctic Tidelands Region. Many of these islands support denning habitat for polar bears and habitat for shorebirds and waterfowl. Numerous camps associated with the subsistence harvest of whales are located on the islands. Oil and gas resources are indicated in this unit.

Unit No.	Name	Designation(s)	Management Intent	Resources and Uses
T-10	Endicott	Wd	Unit is to be managed primarily to accommodate commercial, industrial and related uses or structures associated with marine transportation or adjacent upland uses.	This unit is located east of Prudhoe Bay, encompassing the tide and submerged lands around the Endicott and Liberty developments, and includes the Duck Island Lease Unit. Oil and gas resources are indicated in this unit.
T-11	Badami Dock	Wd	Unit is to be managed primarily to accommodate commercial, industrial and related uses or structures associated with marine transportation or adjacent upland uses.	This unit is located northwest of Deadhorse within the Prudhoe Bay Tidelands and extends from the tidelands to a line approximately one mile offshore. Vessel traffic, moorage and related activities occur here at low levels for industrial purposes. Oil and gas resources are indicated in this unit.
T-12	Point Thomson Dock	Wd	Unit is to be managed primarily to accommodate commercial, industrial and related uses or structures associated with marine transportation or adjacent upland uses.	This unit is located at the Point Thomson facility and extends from the tidelands to a line approximately one mile offshore. The existing tidal infrastructure consists of a dock and O&G related facilities. Vessel traffic, moorage and related activities occur here at low levels for commercial purposes. Oil and gas resources are indicated in this unit.

Notes: *All designations include this statement pertinent to potential roads. “Linear transportation facilities, pipelines, communication infrastructure, and other types of infrastructure or developments that serve a public purpose or are in the interest of the state may be authorized and must consider the values identified for the unit.” (ADNR 2021)

Key: ADF&G = Alaska Department of Fish and Game; ADLs = Alaska Division of Lands; ADNR = Alaska Department of Natural Resources; Alaska LNG = Alaska Liquefied Natural Gas; ANWR = Arctic National Wildlife Refuge; ASAP = Alaska Stand-Alone Pipeline; BLM = Bureau of Land Management; CP = Central Pad; DOG = Department of Oil and Gas; NPR-A = National Petroleum Reserve–Alaska; NSB = North Slope Borough; O&G = oil and gas; PTEP = Point Thomson Export Pipeline; ROW = right-of-way; TAPS = Trans-Alaska Pipeline System; USFWS = U.S. Fish and Wildlife Service

Definitions:

Ha: Habitat-This designation applies to areas of varied size for fish and wildlife species. The identified habitat values for which these lands are classified shall be maintained to the greatest extent practicable. Linear transportation facilities, pipelines, communication, infrastructure, and other types of infrastructure or developments that serve a public purpose or are in the interest of the state may be authorized and must consider the values identified for the unit. This designation converts to a classification of Wildlife Habitat Land.

Hv: Harvest- Fish and wildlife harvest areas are subsistence, recreational or community harvest areas of varied size where alteration of habitat could permanently limit sustained yield to traditional users; or are areas of intense harvest where the level of harvest has reached, or is projected to reach, the harvestable surplus for the resource.

Ma: Materials- Sites suitable for extraction of materials, which include common varieties of sand, gravel, rock, peat, pumice, pumicite, cinders, clay, and sod are designated Materials. Lands designated Materials are closed to new mineral entry and are available for selection by municipalities with the exception of lands that have materials necessary for development, maintenance, and operation of state infrastructure or are necessary for the development and maintenance of the infrastructure on state lands.

Og: Oil and Gas-Areas where known oil and gas resources exist and where development is occurring, or is reasonably likely to occur, or where there is a reason to believe that commercial quantities of oil and gas exist are designated Oil and Gas. This designation converts to a classification of Oil and Gas Land.

Pr: Public Facilities-Retain-These sites are reserved for specific infrastructure to serve state interests. This may include areas intended as open space or to function as riparian buffers. Units designated “Public Facilities-Retain” will be retained in state ownership.

Rm: Resources Management-Land that contains one or more resource values, none of which is of sufficiently high value to merit designation as a primary use, or, because of the size of the parcel, a variety of uses can be accommodated with appropriate siting and design controls, is designated Resource Management…This designation converts to a classification of Resource Management Land.

Se: Settlement-This designation applies to state lands suitable for sale into private ownership through one of the state's land sale programs, and generally excludes shorelands, tidelands, and submerged lands. This designation will generally be used for areas appropriate for land offerings for residential uses.

Tc: Transportation Corridor- This designation applies to land identified for the location of easements and rights-of-way under AS 38.04.065(f), including transportation, pipeline, or utility corridors, or is under consideration for a right-of-way lease. The intent of this designation is to provide a reserve of state land for the eventual development of easements and rights-of-way, including transportation, pipeline, or utility corridors or other linear transportation projects.

Wd: Waterfront Development-This designation applies to areas of tidelands, submerged lands, or shorelands for water-dependent or water-related facilities, commercial or industrial purposes, or for community development. Less-than-fee disposals for such uses and activities as piers, wharves, harbors, mineral transfer facilities, seafood processing facilities, commercial recreation facilities, and other resource development support facilities may be authorized.

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Distribution

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