Oil Discharge Prevention and Contingency Plan
West Inigok Area Exploration Program
National Petroleum Reserve – Alaska

August 2022

Prepared for

North Slope Energy, LLC
1421 Blake Street
Denver, CO 80202

Prepared by

ASRC Consulting & Environmental
a subsidiary of ASRC Energy Services

3900 C Street, Suite 701
Anchorage, Alaska 99503

RECORD OF REVISIONS

Revision Number	Revision Date	Summary of Revision

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MANAGEMENT APPROVAL AND RESPONSE RESOURCES AUTHORIZATION

OIL DISCHARGE PREVENTION AND CONTINGENCY PLAN

WEST INIGOK AREA EXPLORATION PROGRAM

North Slope Energy, LLC

This Oil Discharge Prevention and Contingency Plan (Plan) was prepared for exploration activities on Inigok Lease Areas conducted by North Slope Energy, LLC.

This Plan is approved for implementation as herein described. Personnel, equipment, and materials will be provided as required in accordance with this plan.

William Armstrong,
President Armstrong Oil & Gas, Inc.,
Manager North Slope Energy, LLC

8/12/2022
Date

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ADEC APPROVAL LETTERS

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ACRONYMS AND ABBREVIATIONS

ºF	degrees Fahrenheit
AAC	Alaska Administrative Code
ACS	Alaska Clean Seas
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AIMS	Alaska Incident Management System
AOGCC	Alaska Oil and Gas Conservation Commission
API	American Petroleum Institute
ARRT	Alaska Regional Response Team
AS	Alaska Statutes
ASH	Alaska Safety Handbook
BAT	Best Available Technology
bbl	Barrel(s)
BCP	Blowout Contingency Plan
BLM	US Department of the Interior, Bureau of Land Management
BMP	Best Management Practice
BOEM	US Department of the Interior, Bureau of Ocean Energy Management
BOP	blowout preventer
bopd	barrels of oil per day
CEC	Community Emergency Coordinator
CFR	Code of Federal Regulations
CMT	Crisis Management Team
CON	containment
core plan	Oil Discharge Prevention and Contingency Plan (ODPCP)
CPAI	ConocoPhillips Alaska, Inc.
CPR	cardiopulmonary resuscitation
cu yd	cubic yard(s)
DMLW	Division of Mining, Land and Water
DOT	US Department of Transportation

EPA	US Environmental Protection Agency
ERD	extended reach drilling
EMT	Emergency Medical Technician
EU	Environmental Unit
FOSC	Federal On-scene Coordinator
ft	foot/feet
G&I	grind and inject
gal	gallon(s)
GHz	gigahertz
GIS	geographic information system
GOR	gas-to-oil ratio
gpm	gallons per minute
H_2S	hydrogen sulfide
HAZCOM	Hazard Communication
HAZMAT	hazardous material(s)
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDPE	high-density polyethylene
HES	Health, Environment and Safety
IAP	Incident Action Plan
IC	Incident Commander
ICE	oil recovery under/on ice
ICS	Incident Command System
IMT	Incident Management Team
ISB	in situ burning
LEL	Lower Explosive Limit
LOSC	Local On-scene Coordinator
LR	land recovery
MCC	Main Construction Camp
MHz	megahertz
mi	mile(s)
mils	Millimeter(s)

MMPD	Maximum Most Probable Discharge
mph	miles per hour
MSDS	Material Safety Data Sheet
N/A	not applicable
NART	Northern Area Response Team
NOAA	National Oceanic and Atmospheric Administration
North Slope Energy	North Slope Energy, LLC
NPDES	National Pollutant Discharge Elimination System
NPR–A	National Petroleum Reserve–Alaska
NRC	National Response Center
NSB	North Slope Borough
NSB LEPC	North Slope Borough, Local Emergency Planning Committee
NSTC	North Slope Training Cooperative
O_2	oxygen
ODPCP	Oil Discharge Prevention and Contingency Plan (also core plan)
ORTLA	Oil Resistant Low Temperature Liner Material
OSHA	Occupational Safety and Health Administration
OSRO	Oil Spill Removal Organization
oz	ounce(s)
PA	Physician's Assistant
PBU	Prudhoe Bay Unit
PEL	Permissible Exposure Limit
PERS	Professional Emergency Resource Services
PLU	North Slope Unit
PPE	personal protective equipment
ppm	parts per million
PW	produced water
RP	Responsible Party
RPOSC	Responsible Party On-scene Coordinator
RPS	response planning standard
RQ	reportable quantity

RRT	Regional Response Team
RSC	Regional Stakeholder Committee
SINTEF	The Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology
SOCT	Statement of Contractual Terms
SOSC	State On-scene Coordinator
SPCC	Spill Prevention, Control, and Countermeasure
sq yd	square yard(s)
SRT	Spill Response Team
STEL	Short-term Exposure Limit
STI	Steel Tank Institute
UC	Unified Command
UHF	ultra-high frequency
UL	Underwriters Laboratories
UOP	Unified Operating Procedures
USACE	US Army Corps of Engineers
USC	United States Code
USCG	US Coast Guard
USFWS	US Fish and Wildlife Service
VHF	very-high frequency
VSAT	very small access terminal
WAP	wireless access point
WCD1	Worst Case Discharge Tier 1
WCD2	Worst Case Discharge Tier 2
Witt O'Brien's	Witt O'Brien's, LLC
yd	yard(s)

INTRODUCTION

This Oil Discharge Prevention and Contingency Plan (ODPCP or core plan) has been prepared for the North Slope Energy, LLC (North Slope Energy) West Inigok Area Exploration Program. North Slope Energy is the operator and working interest owner, along with North Slope Exploration, LLC, of the West Inigok Area lease tracts.

North Slope Energy corporate office:

North Slope Energy, LLC
1421 Blake Street
Denver, CO 80202
Telephone: (907) 623-1821

North Slope Energy's Alaska office:

North Slope Energy, LLC
3900 C Street, Suite 701
Anchorage, AK 99503
(907) 339-6200

North Slope Energy plans to conduct a multi-year onshore oil and gas exploration drilling program during winter months on the North Slope. North Slope Energy's West Inigok Area Exploration Program ODPCP will address all onshore exploration activities conducted on the North Slope Unit, which is located east of the Colville River and west of the existing Kuparuk River Unit. This ODPCP serves as a core plan and follows the format outlined in the Alaska Department of Environmental Conservation (ADEC) regulations at Title 18, Alaska Administrative Code, Section 75.425 (18 AAC 75.425). Site-specific addenda will be prepared to supplement this core plan and provide necessary details regarding proposed exploration drill sites. Project-specific addenda shall be prepared and provided to the plan through application for amendment to the core plan. The amendment application shall address the applicable ADEC regulatory requirements for each new project and update the core plan as necessary.

North Slope Energy's core plan contains scenarios demonstrating the regional applicability of spill response strategies and tactics, resources, logistics, and environmental sensitivities. The proposed drilling locations are located on lease tracts west of the Inigok Airstrip. Well sites are located approximately 150 miles from hydrocarbon recycling and processing facilities in the Kuparuk River Bay Unit and within 170 miles for recycling and disposal facilities in the Prudhoe Bay Unit (PBU). Mileage distances are based upon a combination of gravel and snow/ice roads from proposed project locations to storage and processing facilities. The primary factor for assessing equivalence is comparable access and distance logistics to developed infrastructure in the North Slope oilfields. The secondary factor is the resources affected by a spill at the new project location(s) and whether the affected resources are sufficiently similar that the approved scenarios presented in the core plan demonstrate equivalent resource protection and cleanup strategies. Site-specific or updated project information will be incorporated to address any differences in previously approved spill response scenarios for response logistics and resource protection. Supplementary scenarios may be added (amended) to the core plan in the future to address additional areas if exploration programs are expanded.

The objective of this ODPCP is to prevent and/or limit the spread of a spill, minimize potential environmental impacts, and provide safety for personnel. Safety of personnel will always be the primary consideration. This core plan provides North Slope Energy with the background information and response planning guidelines necessary for an effective spill response.

North Slope Energy plans to plans to drill up to two wells each during the winter 2023 exploration season. Snow and ice roads will be used to access drilling. Site-specific information is provided for review in Addendum A.

Alaska Clean Seas (ACS) Technical Manual

This ODPCP incorporates by reference the ACS Technical Manual which describes the tactics that can be used in responding to a variety of spill situations.

This core plan does not repeat verbatim information presented in the ACS Technical Manual since it incorporates the information by reference at the beginning of each section and in the text.

Spill Scenarios

Response scenarios within the core plan demonstrate regional response capability. A key parameter of this regional core plan concept is that all activities are conducted during the winter season. The core plan contains one blowout scenario for an Inigok Area exploration well in winter located up to 150 miles from an existing hydrocarbon processing facility and within 170 miles from the most distance PBU recycling and disposal facilities.

Plan Distribution

Hard copies of this plan will be distributed to regulatory agencies, North Slope Energy contractors, and key North Slope Energy employees engaged in North Slope operations. A copy will be maintained at each North Slope Energy office and active drill site. Additional copies will be located at ACS in Prudhoe Bay.

Updating Procedures

A master copy of the core plan will be maintained at North Slope Energy's corporate office. The core plan is reviewed and updated when changes occur. Revisions are distributed to regulatory agencies and North Slope Energy employees and contractors who are responsible for implementing the core plan and addenda. An updated Record of Revisions form will be sent along with the revised pages. Upon receipt of revisions, the recipient will be instructed to replace the revised pages and replace the Record of Revisions form in the front of the document. It is the responsibility of each plan recipient to ensure updates, revisions, and amendments are promptly incorporated into their copy(s) of the document.

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1.0 RESPONSE ACTION PLAN

1.1 EMERGENCY ACTION CHECKLISTS

Cross-reference:

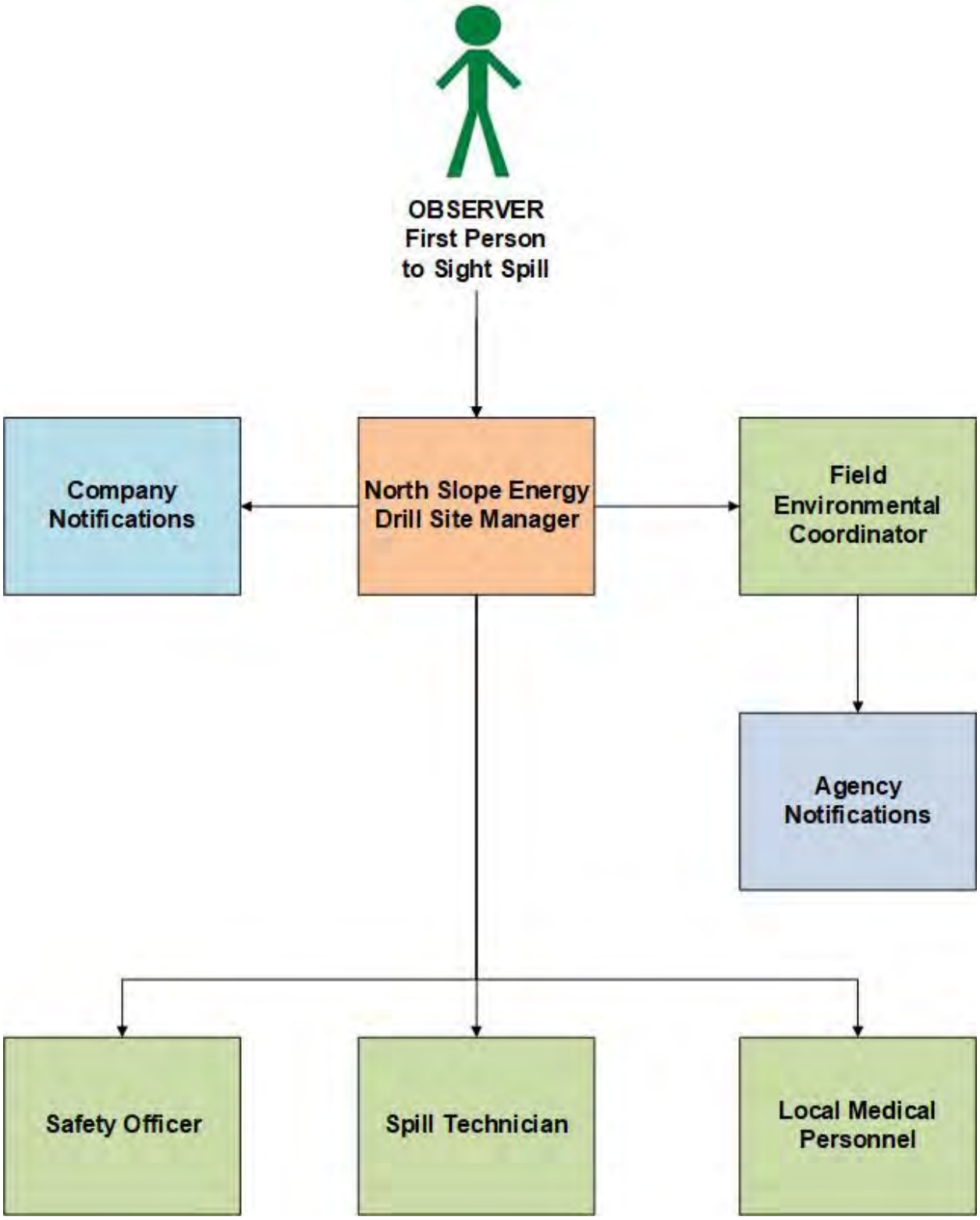
18 AAC 75.425(e)(1)(A)

Wallet Card

Any person who causes or observes a spill will immediately report the spill to his/her supervisor. If your supervisor is not available, notify the Drill Site Manager. The Drill Site Manager, or their designee, will then ensure proper notifications are performed. The typical spill notification sequence is depicted in Figure 1.1-1.

All emergency action checklists are contained in Attachment 1.1-A of this section.

Figure 1.1-1 North Slope Energy Spill Notification



Attachment 1.1-A
Emergency Action Checklists

Individual Checklist/Wallet Card
Immediate Response Checklist

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Note:

All radio and telephone numbers shall be inserted in the corresponding site-specific project addenda section before drilling.

(Copies of these telephone numbers shall be submitted to all plan holders.)

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INDIVIDUAL EMERGENCY ACTION WALLET CARD

North Slope Energy, LLC
INCIDENT REPORTING

If an incident is observed:

1. Get yourself and others to a safe area.
2. Report to your immediate supervisor.
3. If your immediate supervisor is unavailable, report to the Drill Site Manager.
4. Communicate the information listed on the reverse of this card.
5. DO NOT TRY TO STOP RELEASE OR CLEAN UP IF YOU ARE NOT A TRAINED RESPONDER.

REPORT SPILLS PROMPTLY

1. Injuries
2. Material spilled (diesel, glycol, crude)
3. Spill location
4. Time and date
5. Estimated spill volume
6. Spill source
7. Surface area covered
8. Rate of release (drip, spray, hole, rupture)
9. Is fluid moving? Direction?
10. Affected or threatened area (ice, snow, open water, gravel, tundra, facility)

Note: Telephone numbers and/or names for drill site locations are contained in the project addenda.

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Table 1.1-1
Immediate Response Checklist

IMMEDIATE RESPONSE CHECKLIST	
FIRST PERSON TO SIGHT SPILL	*Immediately notify your supervisor or the Drill Site Manager. Take steps to protect people as a first priority only if there is an imminent danger of injury or fatality and it can be safely performed.*
DRILL SITE MANAGER	*The Drill Site Manager or designee ensures the following actions are performed:* 1. *Initiate control operations:* □ *Determine the source of the spill* □ *Turn off electrical power and all other potential sources of ignition from a safe location* □ *If safely possible, stop the source of the spill and/or initiate shut-in procedures* 2. *Account for all personnel and ensure their safety. If necessary, raise the alarm and implement personnel evacuation procedures to a secure muster area* 3. *Determine the possibility of an explosion or fire.* 4. *Assess the spill situation to:* □ *If safely possible, contain the spill by diking, trenching, or berming* □ *Judge the effectiveness of control operations* □ *Determine the type or classification of oil spilled* □ *Estimate the spill volume* 5. *Determine the accessibility of the spill site.* 6. *Assess the meteorological conditions, including:* □ *Wind speed and direction* □ *Air temperature* □ *Storm advisory* □ *Visibility for aircraft*
NOTIFICATIONS	*The following notifications are to be initiated by the Drill Site Manager or their designee:* 1. *Notify the Incident Commander (Witt O'Brien's at 985-781-0804).* 2. *Fill out the Spill Report Form (see Attachment 1.2-A).* 3. *Notify the Field Environmental Coordinator to fax the Initial Spill Report form to the Incident Commander and designated Safety Officer, and appropriate reporting agencies as soon as possible.* 4. *If appropriate, contact Kuparuk Security at 907-659-7994.* 5. *Activate the response organization (ACS at 907-659-2405).* *6.* *Assume control of the spill response activities and implement necessary actions.* 7. *Coordinate with the State On-scene Coordinator (SOSC), Federal On-scene Coordinator (FOSC) and Local On-scene Coordinator (LOSC) to set up a Unified Command Structure to manage the spill response.*
ANCHORAGE INCIDENT COMMAND CENTER	*1.* *Remaining agency notifications.*

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1.2 REPORTING AND NOTIFICATION

Cross-reference:
18 AAC 75.425(e)(1)(B)

Wallet Card

ADEC Spill Report Form

Alaska Inland Area Contingency Plan, Appendix 9100 – Emergency Notification

Alaska Inland Area Contingency Plan, Appendix 9200 – Personnel and Services Directory

Arctic and Western Alaska Area Contingency Plan, Appendix 9100 – Emergency Notification

Arctic and Western Alaska Area Contingency Plan, Appendix 9200 – Personnel and Services Directory

1.2.1 Reporting and Notification

This section provides the names and telephone numbers of the agencies and individuals to be notified in the event of a spill. Notification will be made by the Incident Commander (IC) (or designated alternate). Positions and telephone numbers for the North Slope Energy, LLC (North Slope Energy) Incident Management Team (IMT) are provided in the site-specific addenda. For detailed information on alerting or call-out procedures, see the Emergency Action Checklists, Section 1.1 of this core plan.

The notification sequence varies depending on the size of the spill and required response. A minor spill is defined as a situation where on-site employees do not require assistance from the Spill Response Team (SRT). The situation is not an emergency. An emergency situation exists when any of the following conditions exist:

- Safety and health of any personnel is threatened
- All hazardous and toxic spills
- Release of product cannot be quickly stopped or contained.

The levels described below apply only to the emergency phases of containment and initial recovery.

Level I: Defines a situation where the on-site employees do not require the immediate assistance of the SRT to control and contain a spill.

Level II: A Level I response which requires the call-out of the SRT, and any other resources available on the North Slope.

Level III: A Level II response which requires the activation of all SRT resources and those available from sources other than North Slope suppliers. A major response would be activated in the event of a catastrophic spill and would involve the use of a major spill contractor.

It is the policy of North Slope Energy that employees and contractors report all spills of oil or hazardous material regardless of size to the North Slope Energy Drill Site Manager, or their designee. The on-site North Slope Energy Drill Site Manager or their designee will then notify the on-site Spill Technician. The on-site North Slope Energy Drill Site Manager shall act as the IC for minor incidents only. The on-site

North Slope Energy Drill Site Manager shall act as the Initial IC in a Level II/III incident until relieved; and shall be fully empowered to implement the resources described in this plan. The North Slope Energy Drill Site Manager shall be relieved of the IC's Position when the Tier II / III IC (listed in the site-specific addenda) arrive on location. The IC or his/her designee will ensure that safety and health is the first consideration in all response decisions and that internal notifications are completed as required.

The North Slope Energy spill report form must be completed for all spills (Attachment 1.2-A).

The organizational structure for a typical major response is provided in Figure 1.2-1. Names and telephone numbers for the IMT are provided in the project addenda.

1.2.2 North Slope Energy Command Center

For Level II and Level III spills, the Incident Command Post will be at:

North Slope Energy, LLC

Address/Location:	3900 C Street, Suite 701 Anchorage, AK 99503
Telephone Number:	(907) 339-6200

1.2.3 Response Contractors

The Response Contractors are:

Alaska Clean Seas

Address/Location:	3300 C Street, Suite 200 Anchorage, Alaska 99503
Telephone Number:	(907) 743-8989 or (907) 659-2405
Web Address:	https://alaskacleanseas.org

Witt O'Brien's, LLC

Corporate Location:

Address:	818 Town & Country Boulevard, Suite 200 Houston, TX 77024
Telephone Number:	(985) 781-0804 (Houston Command Center)
Web Address:	www.wittobriens.com

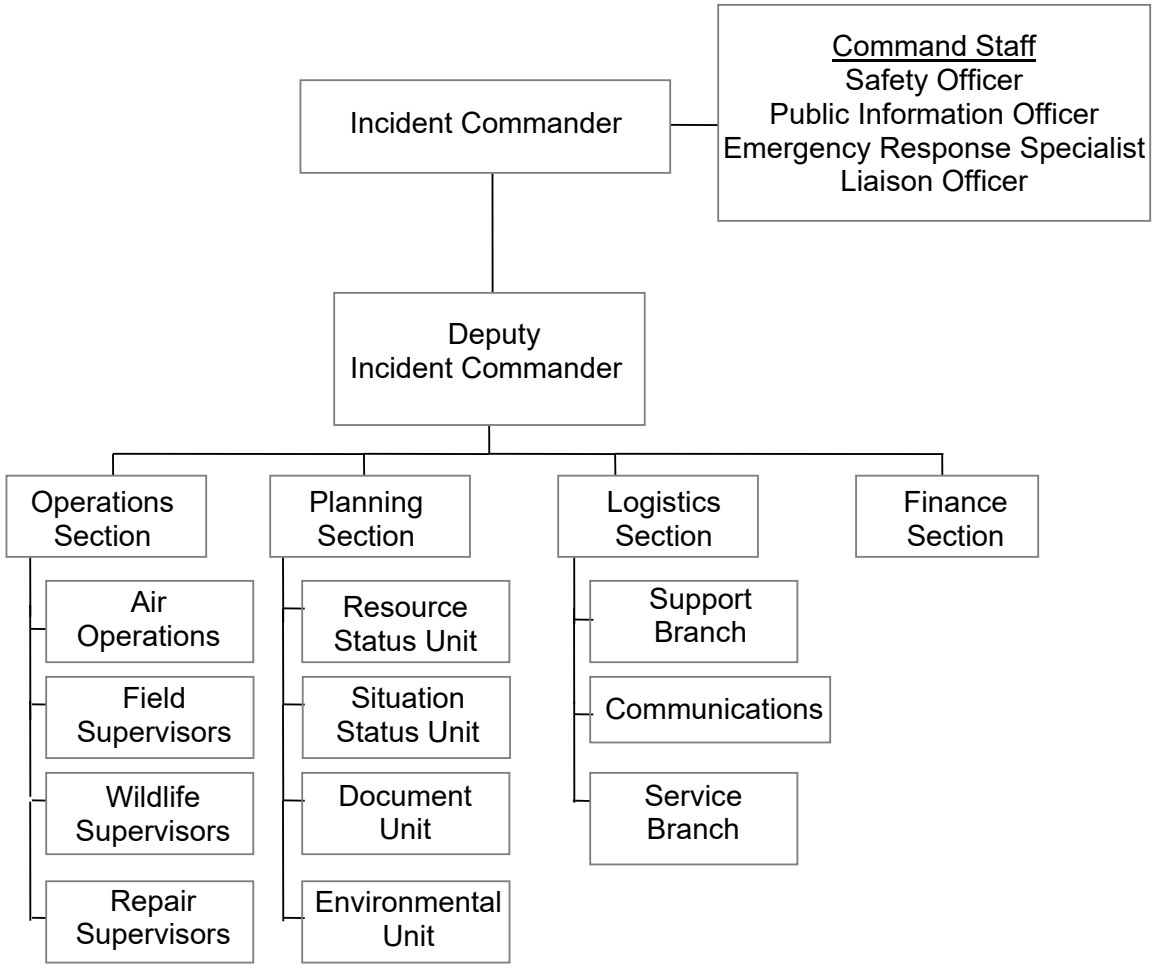
Anchorage Location:

Address:	6160 Carl Brady Drive Anchorage, AK 99502
Telephone Number:	(907) 202-8634

Wild Well Control (well control specialists)

Address/Location:	2202 Oil Center Court Houston, TX 77073
Telephone Number:	(281) 784-4700
Fax Number:	(281) 784-4750
Web Address:	www.wildwell.com

Figure 1.2-1 Organizational Structure for a Response to a Major Spill



1.2.4 External Notification Procedures

The IC or his/her designee is responsible for notifying the appropriate regulatory agencies. The North Slope Energy spill report form is in Attachment 1.2-A. A list of primary agencies to be notified in the event of an oil spill and hazardous material spill is presented in Tables 1.2-1 and 1.2-2. A written record of all contacts would be maintained (agency, person, date, and time). Appropriate agency verbal notification may include:

- Alaska Department of Environmental Conservation (ADEC)
- Alaska Department of Fish and Game (ADF&G) (if applicable)
- Alaska Oil and Gas Conservation Commission (AOGCC)
- Alaska Department of Natural Resources (ADNR)
- National Response Center (NRC)
- National Marine Fisheries Service (NMFS) (if applicable)
- US Coast Guard (USCG) (if applicable)
- US Department of the Interior, Bureau of Land Management (BLM) (if applicable)
- US Environmental Protection Agency (EPA) (if applicable)
- US Fish and Wildlife Service (USFWS) (if applicable)
- North Slope Borough (NSB)
- Villages of Nuiqsut, Anaktuvuk Pass, or Utqiaġvik (if applicable)

1.2.5 Written Report Requirements

The written reporting requirements, as shown in Table 1.2-1, are the responsibility of North Slope Energy.

Discharge or release reporting procedures and requirements for ADEC are as follows:

18 Alaska Administrative Code (AAC) 75.300 requires immediate notification to ADEC of any hazardous material spill to state lands or waterways or any oil spill (greater than 10 gallons [gal]) to lands or any oil spill to waterways. After notification of the discharge has been made to ADEC, the Department will, at its discretion, require interim reports until cleanup has been completed (18 AAC 75.300(d)). A written final report must be submitted within 15 days of the end of cleanup operations, or if no cleanup occurs, within 15 days of the discharge (18 AAC 75.300(e)). A monthly report of each discharge or release of 1 gal to 10 gal of oil solely to land will be provided to ADEC.

Interim and final written report requirements are specified in 18 AAC 75.300(f). The report must contain the following information:

- Date and time of discharge
- Location of discharge
- Name of facility or vessel
- Name, mailing address, and telephone number of each responsible person and the owner and operator of the facility or operation
- The type and amount of each hazardous substance discharged or released

- Cause of the discharge
- Description of any environmental effects of the discharge or release, or the containment and cleanup, to the extent those effects can be identified
- Description of containment or cleanup actions taken
- Estimated amount of hazardous substance cleaned up and hazardous waste generated
- Date and method of disposal or treatment of the hazardous substance, contaminated equipment, contaminated materials, contaminated soil, and contaminated water
- Description of actions being taken to prevent another discharge or release
- Other information the Department requires to fully assess the cause and impact of the discharge.

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Table 1.2-1
Agency Reporting Requirements for Oil and Hazardous Materials Discharges

Produced Water Spills:
1. Estimate % Oil in the Produced Water (PW)
2. Volume of PW Spilled x % Oil = Volume of Oil
3. Volume of PW Spilled – Volume of Oil = Volume of water cut
4. Compare the reporting requirements for the oil and seawater and report whichever triggers the reporting requirement first.

		ENVIRONMENTAL COMPLIANCE AGENCY NOTIFICATION As Soon As Possible (Immediate UNLESS otherwise noted)					
		NRC (EPA)	**ADEC ADNR**	**NSB**	**USCG[3] ADF&G[4]**	**BLM[5]**	**AOGCC Crude or Gas[6]**
OFF PAD or OFFSHORE	(discharges to water or that penetrate tundra)						
Any oil or Hazardous Substance	(oil, drilling fluids, glycol, produced water, brine)	X	X	X	X	X	X
Seawater	Any amount to freshwater environment	X	X	X	X	X	
Sewage[9]	Any quantity	X	X	X		X	
ON PAD or ONSHORE	(snow, ice roads, and ice same as gravel)						
Hazardous Substances[1, 2, 7, 8]	Any amount to land or exceeds federal RQ	X	X	X		X	
Oil[8]	>55 gal		X	X		X	X
(<1 g (clean up/no report)	>10 to 55 gal **(*within 48 hours)**		X*	X*		X*	X
	>1 to 10 gal **(*monthly written report)**		X*	X*		X*	X
Seawater	Any amount to inland freshwater		X	X		X	
Sewage[9]	Any Quantity	X	X	X		X	
IN CONTAINMENT							
Chemicals **No air release or RQ (no report)**	Air release, with RQ (fuel gas excepted) **(*monthly written report)**	X	X			X*	
Hazardous Substances	>55 gal		X			X	
Oil **≤55 gal (no report)**	>55 gal		X			X	X
WRITTEN REPORTING (fax is acceptable)							
Note: For spills >1 gal to 10 gal, if monthly written reports are submitted, a second report is not required for ADEC.	5 days after loss						X
	15 days after loss	X	X			X[4]	X
	15 days after cleanup	X	X			X[4]	X

Notes for Table 1.2-1

[1] Hazardous Substances with federal RQs include ethylene glycol at 540 gal (~13 barrels [bbl]) methanol (pure) at 750 gal (~18 bbl).

[2] Hazardous Substances without RQs include sewage, produced water, and seawater.

[3] All oil spills into or threatening navigable water bodies.

[4] Any release into fish-bearing water bodies.

[5] National Petroleum Reserve – Alaska (NPR-A) spills only, notify within 24 hours.

[6] All spills from wells or involving crude loss; notify AOGCC North Slope Rep. Report oil, gas, brine, glycol, produced water, drilling fluids only.

[7] Reporting procedure based upon ADEC spill reporting criteria as these are more stringent than federal RQs.

[8] EPA letter required within 60 days for oil spills >1,000 gal or any size if second spill within 12 months; all off-pad oil spills and stormwater releases of oil or chemicals >RQ. Ref: 40 Code of Federal Regulations (CFR) 112.4 for more information.

[9] Sewage, including domestic wastewater and gray water spills are reportable to US Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Compliance Unit and ADEC Wastewater Program. Written report due to ADEC within seven days after event.

ADEC = Alaska Department of Environmental Conservation

ADF&G= Alaska Department of Fish and Game

ADNR = Alaska Department of Natural Resources

AOGCC= Alaska Oil and Gas Conservation Commission

BLM = US Department of the Interior, Bureau of Land Management

EPA = US Environmental Protection Agency

gal = gallon(s)

NRC = National Response Center

NSB = North Slope Borough

RQ = reportable quantity

USCG = US Coast Guard

Table 1.2-2
Agency Telephone Contact List

Agency	Telephone Number	Contact	Fax Number	Notes
ADEC Normal Business Hours Reporting	(907) 451-2121	Northern Alaska Response Team	(907) 451-2362	Spill in excess of 55 gal on land and an oil spill of any size to water must be reported immediately. Written report due within 15 days after cleanup for spills greater than 10 gal. Written report due within 15 days if no cleanup occurs. Monthly written record log for 1 gal- to 10-gal spills.
ADEC After Hours Reporting	(800) 478-9300	ADEC Division of Prevention and Response	--	Verbal notification.
NRC (includes EPA, DOT, notification)	(800) 424-8802 or (202) 267-2675	Marine Safety Officer	--	Can use website to notify. Obtain assigned incident number.
ADNR - DMLW	(907) 451-2678	Voice Recorder	(907) 451-2751	For large spill contact DMLW Staff person working project as courtesy (907) 451-2740.
AOGCC – Anchorage	Main Number	(907) 279-1433	--	(907) 793-1236
		Use Test Witness Notification form "Other"	--	doaa.alaska.gov; Test Witness Form automatically emails to all appropriate staff.
ASRC (landowner)	(907) 339-6017	Erik Kenning	--	Notify if spill affects ARSC lands.
BLM	(907) 474-2307	Melody Debenham	--	NPR-A and BLM lands only. kdebenham@blm.gov BLM_AK_Arctic_Permitting@blm.gov
NSB – Land Management	(907) 852-0320	Planning Department	(907) 852-0322 (Preferred)	Chastity Olemaun, Mable Kaleak and Lily Kilapsuk. For spills >55 gallons, call Leroy Oenga Jr. at (907) 301-1461
NSB – LEPC	(907) 852-0248	Frederick Brower	(907) 852-0356	Courtesy only; receives information from Planning Department
ADF&G	(907) 459-7363 (907) 459-7280	Todd Nichols	(907) 459-7303	Courtesy; technical assistance for release affecting wildlife (including injuries) or fish-bearing waters.
EPA – Anchorage	(907) 271-1273	Bob Whittier	(907) 271-3247	Courtesy only; NRC fulfills requirement
USCG	(907) 428-4200	Marine Safety Officer	(907) 428-4218	Courtesy only; NRC fulfills requirement

Notes for Table 1.2-2

ADEC =	Alaska Department of Environmental Conservation
ADF&G =	Alaska Department of Fish and Game
ADNR =	Alaska Department of Natural Resources
AOGCC =	Alaska Oil and Gas Conservation Commission
ASRC =	Arctic Slope Regional Corporation
BLM =	US Department of the Interior, Bureau of Land Management
DMLW =	Division of Mining Land and Water
DOT =	US Department of Transportation
EPA =	US Environmental Protection Agency
gal =	gallon
NRC =	National Response Center
NSB =	North Slope Borough
NSB LEPC =	North Slope Borough, Local Emergency Planning Committee
PERS =	Professional Emergency Resource Services
USCG =	US Coast Guard

Attachment 1.2-A Spill Report Form

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Spill Report Form

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

OIL & HAZARDOUS SUBSTANCES SPILL NOTIFICATION FORM

ADEC USE ONLY

ADEC SPILL #:	ADEC FILE #:	ADEC LC:

PERSON REPORTING:	PHONE NUMBER:	REPORTED HOW? (ADEC USE ONLY) ☐ Phone ☐ Fax ☐ PERS ☐ E-mail
DATE/TIME OF SPILL:	DATE/TIME DISCOVERED:	DATE/TIME REPORTED TO ADEC:
INCIDENT LOCATION/ADDRESS:	DATUM: ☐ NAD27 ☐ NAD83 ☐ WGS84 ☐ Other _____ LAT. LONG.	PRODUCT SPILLED:
QUANTITY SPILLED: ☐ gallons ☐ pounds	QUANTITY CONTAINED: ☐ gallons ☐ pounds	QUANTITY RECOVERED: ☐ gallons ☐ pounds
QUANTITY DISPOSED: ☐ gallons ☐ pounds		

	POTENTIAL RESPONSIBLE PARTY:	OTHER PRP, IF ANY:	VESSEL NAME:
Name/Business:			
Mailing Address:			VESSEL NUMBER:
Contact Name:			>400 GROSS TON VESSEL: ☐ Yes ☐ No
Contact Number:			

SOURCE OF SPILL:	CAUSE CLASSIFICATION: ☐ Accident ☐ Human Factors ☐ Structural/Mechanical ☐ Other
CAUSE OF SPILL: ☐ Under Investigation	
CLEANUP ACTIONS:	
DISPOSAL METHODS AND LOCATION:	

AFFECTED AREA SIZE:	SURFACE TYPE: *(gravel, asphalt, name of river etc.)*	RESOURCES AFFECTED/THREATENED: *(Water sources, wildlife, wells, etc.)*
COMMENTS:		

ADEC USE ONLY

SPILL NAME:	NAME OF DEC STAFF RESPONDING:	C-PLAN MGR NOTIFIED? ☐ Yes ☐ No

DEC RESPONSE: ☐ Phone follow-up ☐ Field visit ☐ Took Report	CASELOAD CODE: ☐ First and Final ☐ Open/No LC ☐ LC Assigned	CLEANUP CLOSURE ACTION: ☐ NFA ☐ Monitoring ☐ Transferred to CS or STP
COMMENTS:	Status of Case: ☐ Open ☐ Closed	DATE CASE CLOSED:
REPORT PREPARED BY:		DATE:

Revised 6/16/2014

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1.3 SAFETY

Cross-reference:

18 AAC 75.425(e)(1)(C)

ACS Technical Manual, Tactics S-1 through S-6

Alaska Safety Handbook

1.3.1 General Safety Procedures

General health and safety procedures for operational activities at spill sites are covered in North Slope Energy's, Safety Plans and Procedures and the ACS Technical Manual. North Slope Energy's IC or designated alternate, assisted by the on-site Safety Officer is responsible for implementing these plans.

Substances most likely to be on site and spilled include crude oil, diesel fuel, and gasoline. Material Safety Data Sheets (MSDSs) for these substances are maintained at the main camp office for the drill site.

1.3.2 General Safety Precautions during a Spill Response

The Alaska Safety Handbook (ASH) is distributed to all North Slope employees and contractors. All employees will be trained in the use of this manual. Employees shall be briefed on any changes to the ASH and any necessary training shall be performed at the work site.

North Slope Energy has developed well plans for each drill site that have been designed to ensure drilling activities are performed in a safe and environmentally sound manner. These plans identify procedures, systems, and equipment employed in drilling. They use the best technical information available concerning subsurface formation characteristics and provide information critical to the success and safety of each drilling program.

Facility evacuation plans and diagrams contained in the emergency action plans are available at each of the drill sites.

Additional general safety precautions to be implemented during a response to a spill include:

- Secure the area.
- Eliminate ignition sources where appropriate.
- Work upwind of spill, if possible.
- Monitor Lower Explosive Limit (LEL) for hydrocarbon vapors.
- Monitor for benzene in crude oil spills. The Permissible Exposure Limit (PEL) for benzene is 1 part per million (ppm). The Short-term Exposure Limit (STEL) for benzene is 5 ppm.
- Monitor oxygen (O_2) levels, particularly for spills in poorly ventilated areas. O_2 levels should be between 19.5 and 21 percent.
- Monitor for hydrogen sulfide (H_2S) in crude oil spills. The STEL for H_2S is 15 ppm.
- Obtain and use Personal Protective Equipment (PPE), including respiratory, skin, eye, and splash protection.
- Make sure supervisors know where you are working.

- Monitor other workers for signs of heat stress or hypothermia.

1.3.3 Personal Protective Equipment

Included below is a list of PPE North Slope Energy workers are required to wear if they are involved in cleanup activities, in addition to any PPE required by the ASH or the ACS Technical Manual, Tactic S-3:

- Safety glasses, goggles, or face shields
- Hard hats
- Oil-resistant boots or arctic foot gear with oil resistant protective covers and ice grippers as appropriate
- Polyethylene or other appropriately coated Tyvek® suits or rain gear to maintain the cleanliness of the worker's arctic gear and to prevent skin contact with the oil product
- Respirators as required by health and safety monitoring
- Oil-resistant gloves/mittens
- Personal flotation devices as required by the specific work locations and tasks
- Other clothing appropriate to the environmental conditions.

A method to develop a site-specific safety plan is presented in the ACS Technical Manual, Tactics S-1 and S-2. This plan provides detailed information to develop an incident-specific site safety plan.

1.4 COMMUNICATIONS

Cross-reference:

18 AAC 75.425(e)(1)(D)

ACS Technical Manual, Tactics L-5 and L-11A

Alaska Inland Area Contingency Plan

Arctic and Western Alaska Area Contingency Plan

1.4.1 Communications Plan

Note: See the site-specific addenda for additional communication information on each site.

Effective communication during a spill response requires that all parties know and use assigned radio frequencies and telephone numbers. Use of preprogrammed and designated frequencies ensures that emergency communications are established immediately for response.

As spill response efforts grow, additional frequencies and telephone numbers may be added to a complete Communications Plan that is distributed to all parties.

The Communications Unit Leader is responsible for establishing a plan that provides coverage in the field and between the field and a command post. Communication requirements are determined by many factors, the most important of which are the location and nature of the spill response activities, and the number of staff placed in the field. Specific requirements include:

- Communications systems must be self-contained, compact, highly portable, and capable of providing all on-site and off-site communication links for the duration of the response.
- Communication (and other) equipment used in the immediate vicinity of spilled or recovered product must be intrinsically safe (explosion proof).

Field teams will work in close proximity to each other, and generally require only a single tactical communication link operating over a distance of several miles. A repeater radio link would be required to bridge worst-case distances from the field to the staging area and support teams.

The Alaska Statewide Frequency Plan consists of 48 channels, designated OS-29 through OS-76. When referring to these channels, the channel number is always prefixed with the letters “OS”. This clarifies the identity of the channel under discussion and minimizes potential confusion that the channel might represent a marine channel, or some other internal company channel.

Table 1.4-1
Summary of Alaska Statewide Frequency Plan Channels

Channel	Type	Description
OS-29 through OS-32	Tactical channels	Match marine radio channels.
OS-33 through OS-52	Fixed repeater channels (and associated talk-around channels)	Located on the North Slope, along the Alyeska Pipeline corridor, and in Cook Inlet or Prince William Sound. The talk-around channels are available for tactical use when operating in an area not covered by the associated repeater channel.
OS-53 through OS-64	Portable repeater channels (and associated talk-around channels)	Licensed for use statewide. The talk-around channels are available for tactical use when operating in an area not covered by the associated portable repeater channel.
OS-65 through OS-68	Air Logistics very-high frequency (VHF) repeater (and associated talk-around channels)	For tactical, operations, and logistics use, as required.
OS-69	Emergency channel statewide	Emergency use
OS-70 through OS-76	Marine channels OS-70 (Marine 09) OS-71 (Marine 10) OS-72 (Marine 11) OS-73 (Marine 16) OS-74 (Marine 18) OS-75 (Marine 80A) OS-76 (repeater, Marine 85)	Note: Marine channels are specifically given “OS” designations that do not reflect the actual marine channel number.
OS-77 through OS-79		Reserved for potential future expansion of emergency use channels.

1.4.2 Communications Equipment

The communication plan for exploration activities incorporates technology commonly used during remote operations on the North Slope. Exploration drilling operations would use a combination of satellite and microwave communication systems that would provide broadband voice, data, and facsimile lines The primary means of communication would consist of a very small aperture terminal (VSAT) system with satellite dish for phones and data. The rig and camp will be linked by two wireless access point (WAP) units and microwave node for direct communications. Additionally, line-of-sight communications would be provided through ultra-high frequency (UHF) and very-high frequency (VHF) radios. In the event of a response incident, a transportable communication system would be deployed to support UHF and VHF portable radios use with field operations.

The general communications equipment maintained on site with the drill rig would be appropriate for the specific project. Additional repeaters may be located as necessary throughout the proposed exploration area to ensure that coverage is available to drill sites, ice airstrips, and mobile equipment. Refer to the site-specific addenda for details on the components of the communication system.

1.4.3 Equipment Maintenance

Communications equipment will be periodically tested and maintained according to the following schedule:

- Monthly:
  - All rechargeable batteries will be tested and recharged.
  - All radio and electronic equipment will receive an operational test to ensure that the equipment is working.
- After Use:
  - All communications equipment used in actual spill response operations will be inspected, cleaned, and tested before being returned to storage.

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1.5 DEPLOYMENT STRATEGIES

Cross-reference:
18 AAC 75.425(e)(1)(E)

ACS Technical Manual, Tactics L-3 and L-4

Deployment strategies for spill response to exploration drilling on the North Slope would be based upon the response tactics and capabilities generally provided by the ACS Technical Manual. Key elements for quick deployment to a situation are timely notifications and activation, appropriate transportation infrastructure, and trained personnel deploying readily available response resources.

1.5.1 Transportation to Spill Site

North Slope Energy's exploration drilling operations would be conducted during the winter on ice pads with snow/ice road access from existing road infrastructure. North Slope Energy would initially establish a trail using Rolligons or tracked vehicles which would pre-pack the route to promote frost penetration. Following pre-packing operations, a spike camp with work crew would be mobilized to begin construction of the primary snow/ice road access route and the first drill site ice pad. The drill rig, camp, and ancillary equipment would be mobilized once snow/ice road access and the first ice pad are established. Additional snow/ice road routes and drill site pads may be constructed depending upon the operational needs for each season.

North Slope Energy and its contractors' daily operations will provide an infrastructure for a spill response. The extensive transportation infrastructure for personnel and equipment can support a small response. In the event of a major spill, support contractors would promptly initiate armoring of snow roads by adding snow and ice, then saturating and capping with water to thicken and strengthen the road to permit travel by conventional wheel vehicles. Transportation options, depending on the location, season, and weather, include vacuum truck and dump vehicles, Rolligons, tracked vehicles, helicopters, and fixed-wing aircraft (Table 1.5-1). Specific transportation routes and access for projects are depicted in diagrams included with each site-specific addendum.

Table 1.5-1
Seasonal Transportation Options

MODES OF TRANSPORTATION	SEASONS		
	SUMMER	WINTER	BREAKUP/FREEZEUP
Helicopters	X	X	X
Rolligons	LIMITED	X	X
Tracked Vehicles	LIMITED	X	X
Fixed-wing Aircraft	X	X	X
Vehicles	LIMITED	X	LIMITED

The estimated response time from a discovery of a spill at the drill site to the deployment of equipment varies depending on the circumstances that caused the spill, the size of the spill, time of year, logistical support, and available information. Estimated snow/ice road distances and response times for each of the proposed exploration prospects are included in the site-specific addenda.

Actual response and mobilization times will vary depending on a variety of factors, such as weather, personnel safety and health, wildlife considerations, and terrain. Only on-site personnel and equipment will conduct spill response during adverse weather conditions that prohibit the safe transport of equipment, personnel, and other resources to the spill site.

Refer to site-specific addenda for information on travel times from the North Slope, Anchorage, and Fairbanks to the project area for a variety of transportation equipment. The scenarios in Section 1.6.12 illustrate deployment strategies for spill response equipment to a West Inigok Area exploration drill site.

1.5.2 Transportation Alternatives

Pre-staged Equipment — Equipment that will be pre-staged at a drill site is identified in Section 3.6 and the site-specific addenda.

Air Access — Air transportation by helicopter to drill site locations is possible throughout the year, weather permitting. Passenger and cargo aircraft are capable of landing at the Deadhorse Airport and airstrips at Inigok, Nuiqsut, Kuparuk, or Alpine. Air operations can be limited by weather conditions, as discussed in Section 3.4. In general, air access is best suited for movement of personnel and for emergency movement of supplies or equipment. Estimated time for mobilization and transportation of response resources by air will be provided in the site-specific addenda, as appropriate.

1.5.3 Equipment Deployment

On-site equipment would be deployed immediately following safety and health assessment and initiation of efforts to secure the spill source. Deployment is directed by the Initial IC and handled by the work crew on site. On-site equipment is primarily for defensive actions and recovery of small spills. Larger spills would entail mobilization of additional resources from ACS.

1.5.4 Response Action Contractor Mobilization

Section 1.1 of this ODPCP describes immediate response and notification actions, which include notification of ACS (Section 1.2.3 and Section 3.8). While ACS is mobilizing personnel and equipment to the spill site, North Slope Energy personnel will determine safety and health procedures, notify government agencies and other North Slope Energy spill team personnel, and proceed with source control measures. In addition, on-site response personnel will deploy on-site spill containment equipment, if safe to do so.

1.6 RESPONSE STRATEGIES

Cross-reference:

18 AAC 75.425(e)(1)(F)

ACS Technical Manual

Alaska Inland Area Contingency Plan

Arctic and Western Alaska Area Contingency Plan

Tundra Treatment Guidelines – A Manual for Treating Oil and Hazardous Substance Spills to Tundra

The following subsections provide information on the strategies used for responding to incidents at a drill site. This information supports the discussions in Section 1.6.12, Spill Response Scenarios. Where warranted, a narrative discussion has been provided; otherwise, the reader is directed to the relevant portion of the scenarios.

1.6.1 Procedures to Stop Discharge

Procedures to stop a discharge from an exploration well are discussed in Section 2.1.6. Procedures to prevent spills resulting from fuel transfer operations at drill sites are described in Section 2.1.7.

Tanks and Fuel Transfers

The primary procedure to stop a discharge from a fuel transfer operation or tank is to shut down the supply source or loading-line valve. Fuel transfer operations are monitored at all times by two persons who maintain line-of-sight communication. In the event of a hose or tank rupture, immediate steps would be taken to plug or patch the source to prevent further leakage, as well as providing containment, if possible, to prevent the spread of the spill. Supplies of sorbent pads and booms are maintained at the drill site to assist in controlling the spread of spills. Liners are used beneath all connections to catch leaks or any residual product remaining in hoses or lines.

Blowout Control

North Slope Energy certifies that it maintains a Blowout Contingency Plan (BCP) developed in conjunction with Wild Well Control.

In the unlikely event that well control is lost, safety procedures would be employed to protect personnel, stop the spill, protect the environment, and protect equipment. If secondary control is lost and there is an uncontrolled loss of fluids at the surface, detailed plans would be implemented to regain control. A thorough evaluation of the actual situation is necessary to determine the best course of action, although several courses of action could be initiated to allow for contingencies. North Slope Energy considers mechanical surface-control methods such as well capping as Best Available Technology (BAT), versus relief well drilling for well source control.

In the event that surface-control measures are not effective, North Slope Energy will develop provisions for drilling a relief well. One of the first considerations in the event of a well blowout is the need for drilling a relief well, because of the lead time involved in moving a rig to a suitable surface location and drilling the relief well. Although preparations for a relief well may be one of the first actions taken,

regaining control of the blowout by pumping mud or cement down the well to contain the spill is typically much faster and preferred over drilling a relief well and generally more successful. Throughout the world, the number of well-control incidents which require a relief well being drilled is extremely small. North Slope Energy does not rely on relief well drilling as the primary method of source control. However, because of long lead times associated with drilling a relief well, the relief well plan is developed concurrent with the implementation of surface-control methods, if well-control specialists determine that a relief well would be an effective control method.

Several surface options are available and would be attempted prior to initiating a relief well. Well control may be regained by removal of some of the blowout preventer (BOP) stack and installation of a master valve. Another method for regaining control is diversion of the flow to allow installation of additional remotely operated, well-control equipment to the existing stack or on the wellhead. Wild Well Control personnel and required equipment for well control are available through Wild Well Control in Houston, Texas and on the North Slope through North Slope service contractors. Both sources of equipment and personnel can be mobilized generally within 72 hours of notification.

Over the past decade, well-capping techniques have been developed and proven to be efficient and effective in regaining control of damaged wells and reducing associated environmental impacts. Significant improvements to well-capping techniques and procedures have been developed by a variety of well-control specialist companies throughout the world.

Well-capping response operations are highly dependent on the severity of the well-control situation. North Slope Energy has the ability to mobilize specialized personnel and equipment (e.g., Athey wagon and cutting tools) to a North Slope location within 72 hours of notification. The materials required to execute typical mechanical control responses (e.g., junk shots, hot tapping, freezing, or crimping) are small enough to be quickly made available. Other equipment necessary during well-capping operations are commercially available on the North Slope (e.g., bulldozers, cranes, pumps, block-and-tackle, large-diameter casing) and can be made available within 48 hours of notification of the actual emergency.

Mechanical methods may not be required to regain well control. Loss of surface control may cause a pressure drop in the well bore. As reservoir formations flow, equalizing pressure of the reservoir, the bridging that results causes a decrease in surface flow.

Surface Control

Section 2.1 outlines the preventive measures to minimize hydrocarbon spill potential that are applied to exploratory drilling operations. All well control discussions in Section 2.1.6 are aimed at preventing spills from occurring during drilling operations. In the unlikely event that well control is lost; every effort would be made to provide control at the surface. Historically, regaining control at the surface is faster than drilling a relief well and has a high success rate. An uncontrolled flow at the surface presents a serious safety and health hazard. All decisions and response options would be assessed within the context of safety and health of personnel, environment, and property.

Loss of surface control maximizes the pressure drop across the formations. Under these conditions, reservoir formations flow to equalize pressure, and the resulting bridging causes decreased flow at the surface. While surface control can be regained through this process, referred to as natural bridging, additional mechanical methods are employed as soon as the well can be safely accessed. The exact surface control methods used depend on the type of situation. Potential mechanical surface control methods include:

- Establishing primary control by pumping kill-weight fluids (mud, cement, brine)

- Establishing secondary control by replacing, repairing, or adding mechanical containment equipment.

Each of these methods may require removal of equipment around the rig, or the rig itself, to minimize damage, ensure personnel and environmental safety and health, and gain access to the wellhead. Once safe access is established, uncontrolled fluids at the surface would be diverted into a collection area.

Well Control Specialists

Wild Well Control is an international contractor that responds to and solves emergency well control situations. In the event of an ongoing well blowout, Wild Well Control would be contacted at (281) 784-4700, which is a 24/7/365 telephone number. Once notified, Wild Well Control would charter an aircraft and mobilize specialists to Deadhorse, Alaska. These individuals would make the first assessment and then determine the appropriate equipment and personnel to regain well control. All equipment and personnel needed to combat an "unobstructed" well flow are located on the North Slope or in Houston, Texas.

North Slope Energy would provide all coordination and communication with state, local, federal government agencies, and support services.

Well Capping

North Slope Energy maintains a master service agreement with Wild Well Control to provide for the mobilization of all personnel and equipment necessary to initiate well-capping or other surface-control options. In addition, standard industry practice would be to provide any available resources to combat a well blowout incident since such a significant event would affect all North Slope operations. In the event of a well control incident, North Slope Energy would notify Wild Well Control to mobilize all necessary personnel and equipment from Texas via heavy-lift aircraft, which may include a mobile command center, fire pumps, and an Athey wagon (tractor-mounted crane-boom for manipulating tools and equipment in and around a blowout well). Other heavy equipment that would be used for clearing away the rig and diversion of blowout fluids is readily available from North Slope service contractors, including bulldozers, cranes, pumps, and vacuum trucks. Specialized cutting tools and capping stacks to assist with rig or BOP removal could be available from Houston, Texas. Specialized equipment required for well capping is summarized in Table 1.6-1.

A typical blowout-capping team would consist of four Wild Well Control specialists and a minimum of six rig crew members or field personnel to assist the specialists. During the first three days, equipment and personnel are mobilized to the scene. Equipment would be mobilized as required for each stage of the capping operation. Concurrent with mobilization, site personnel would conduct a site assessment, develop a site access plan, set up staging, and begin diversion of blowout fluids to a safe collection area. Once essential equipment and personnel are on scene, the drill rig would be moved off the well and, if necessary, the BOP replaced over the next seven days. The final five days would be devoted to installing the new capping stack, operating the high-pressure pumps, and killing the well.

An ignited well may require more time to control by capping. An ignited well generally presents a safer work environment for vapor hazards, personnel exposure risks, and serves to remove oil from reaching sensitive resources. Adverse weather and well ignition could account for additional days to achieve final control. The planned timing for well capping is summarized in Table 1.6.2.

Table 1.6-1
Well Capping Equipment List

Component(s)	Well-capping Usage	Location	Availability
6,000-gpm fire pumps	Fire and heat suppression.	North Slope	< 48 hours
Athey Wagon	Tractorized boom for manipulation of tools in and around the blowout well.	North Slope	< 48 hours
D-8 bulldozers	Power for Athey wagon and backup for heavy equipment, rig moving; can also be used for berm construction to aid in spill containment.	North Slope	< 48 hours
Excavator	Construction of trenches and drainages.	North Slope	< 48 hours
100- to 200-ton Crane	Heavy equipment lifting capability. If well blowout is ignited, may be needed to facilitate rig move.	North Slope	< 48 hours
500-ton Drilling Blocks and Line	Block-and-tackle system for moving or dragging heavy equipment.	North Slope	< 48 hours
Venturi Tube	Used to construct venture tubes to divert blowing well bore fluids (ignited and unignited).	North Slope/ Texas	< 48 hours[1]
Kill Pumps	Backup to rig pumps.	North Slope	< 48 hours
Junk Shot Manifold	Manifold system constructed to pump small leak-sealing materials into well.	North Slope	< 48 hours
Hot Tap Tool	Manifold used to gain safe access to pressurized tubulars at surface.	North Slope	< 48 hours
Crimp Tool	Sized device used to pinch tubulars closed to seal off internal flow.	Texas	< 48 hours
Abrasive Cutter	High-pressure cutting tool used to sever leaking BOPs and rig structures.	Duncan, Oklahoma	< 48 hours
Capping Stack	Various high-pressure BOP stacks (to replace leaking, damaged, or severed primary BOPs).	Texas	< 48 hours[2]
Miscellaneous Equipment	High-pressure chiksan, flexible hoses, valves, containment boom, absorbent, hand tools.	North Slope/ Texas	< 48 hours
Heavy-lift aircraft	Aircraft capable of lifting 48,000-pound loads into remote or onshore locations.	Anchorage	< 48 hours

1. The Venturi Tube could be manufactured on site.
2. The Capping Stack is not required until Day 5. It would be transported to Anchorage or Fairbanks in a Boeing 747 or similar heavy-lift jet aircraft, then to the North Slope using a C-130 or similar.

BOP = blowout preventer
gpm = gallons per minute

Table 1.6-2
Well Capping Timing

Element	Timing
Mobilize personnel and equipment	1 to 3 days
Conduct site assessment and planning	1 to 3 days (concurrent with mobilization)
Remove rig and blowout preventer, if necessary	7 days
Install cap and kill well	5 days
Total	15 days

Blowout Ignition

Intentional ignition of a blowout would be a decision made by North Slope Energy management in conjunction with regulatory agencies. The decision to ignite a blowout would be made only after assessing the probability of implementing successful source control, reviewing potential safety and health hazards, addressing pertinent environmental considerations, and obtaining necessary agency approvals.

One potential justification for the ignition of a blowout would be a gas blowout where the hydrocarbon had a toxic component such as H_2S. In such instances, the blowout may be ignited to control the toxic gases while preparations are being made to kill the well. Once well-kill preparations were in place, the fire would be extinguished and the kill operations would commence. Direct telephone and/or radio communication would be maintained with the Source Control Unit Leader if any burning activities occur.

Relief Well

Long lead times are expected for relocating a rig to a suitable surface location and drilling a relief well to kill a well blowout at a West Inigok Area well. For this reason, the Unified Command (UC) may initiate the relief well planning concurrently with the implementation of surface control methods. If surface control measures fail, North Slope Energy would develop the relief well plans to be implemented. The following provides information on elements of relief well activities including identification of surface location, equipment, and time. The amount of time required to execute a relief well depends on the success of surface control techniques and well conditions, including any natural bridging that may occur. Prior to drilling the identification of relief well drilling rig(s) and any necessary agreements ensuring access to the rig(s) would be made available to ADEC.

Relief Well Surface Locations

The optimum surface location for a relief well depends on several factors including the depth and direction of the wellbore, personnel safety and health, and weather conditions. The surface location would be selected so the relief well could be drilled in the most efficient manner. Other surface location considerations include hole angle, minimizing drilling time, and directional control.

An alternative rig would be deployed for a relief well and a new ice pad will be constructed. The rig could be placed on a new ice pad as close as possible above the bottom hole location of the blowout well.

Relief Well Drilling Rig and Equipment

All the equipment necessary for drilling the relief well is in drilling stock, either on the North Slope or in Fairbanks. Truckable rigs can be mobilized to provide relief well drilling in a well control incident.

Relief-well rig-mobilization plans begin immediately upon a confirmed well-control situation. The primary relief well option is mobilization of another rig in use nearby. In accordance with standard oil industry practice, other operators would commit the necessary rigs and resources to combat a well control incident if a North Slope Energy-operated rig is unavailable (through a commercial agreement or other necessary agreements). Operator cooperation and sharing of resources have often been used on the North Slope when rigs, equipment, and other services are in short supply. Although some equipment is specified in the plan, this equipment may be replaced by functionally similar equipment, as necessary.

Relief Well Timing

The drilling of the well could begin as soon as the rig-up was complete and all necessary equipment, material and personnel are on location. The planned range of time for completing a relief well is described in Table 1.6-3.

Table 1.6-3
Relief Well Timing

Element	Timing
Construct ice pad	10 to 14 days
Set conductor, mobilize rig	5 to 21 days
Spud, drill relief well, and kill well	20 to 30 days
Plug and abandon	2 to 4 days
Demobilize rig	5 to 10 days
Total	42 to 79 days

A range of time is given for controlling a blowout by drilling a relief well due to a number of unpredictable circumstances that may occur including weather, cause of blowout, choice of surface location, and depth of well. Should the relief well operations extend beyond approximately April 30, or such time when the snow/ice roads would not be safe for highway vehicles, the igniting of the plume would be strongly considered. Additionally, North Slope Energy will consider storing the drill rig on either a gravel pad or insulated ice pad. Both of the last two options may require the construction of such pads.

Permits

In the event of a well blowout, a series of federal, state, and local permits would be required to support the response effort. Permits would be needed to authorize construction of gravel and/or onshore support facilities (e.g., ice or gravel staging pads, temporary storage areas, temporary water uses).

Federal approval would be required in the form of a Section 404/10 permit from the US Army Corps of Engineers (USACE) for placement of gravel (fill) in waters of the United States (wetlands, water bodies, or nearshore coastal waters). The USACE has issued Nationwide Permit 20, which authorizes placement of fill needed for cleanup of spilled oil. This authorization would require approval from the Regional

Response Team (RRT) and, assuming the RRT agrees with the overall cleanup strategy for this specific spill event, would most likely be approved very rapidly.

In addition, as part of overall North Slope oil spill preparedness, permits authorizing a variety of cleanup and response-related activities include Emergency Oil Spill Response permits from the NSB; the ADNR, Division of Land; and the ADF&G. Streamlined access to permit applications, forms, guidance and contacts may be found online at: http://dec.alaska.gov/spar/perp/permits/index.htm

1.6.2 Fire Prevention and Control

In the event of a spill, all sources of ignition must be eliminated, provided it is safe to do so. In addition, accidental ignition must be prevented during a spill response by using explosion-proof equipment and non-sparking tools where necessary. Fire extinguishers and controls are maintained at the drill site.

1.6.3 Discharge Tracking

Discharge tracking will be conducted primarily through visual observation. Visual observations may be conducted on land or via helicopter or aircraft overflights to delineate the spill area. Discharge tracking is discussed in the scenarios provided in this ODPCP, the Tundra Treatment Guidelines Assessment and Monitoring, Tactic AM-1, and the ACS Technical Manual, Tactics T-1, T-2, T-5, and T-6. Guidelines for air overflights and cleanup assessment team observations are available through the National Oceanic and Atmospheric Administration (NOAA) website: https://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/resources.

1.6.4 Protection of Sensitive Areas

North Slope Energy has established drilling end dates for its winter drilling program (see site-specific addenda for specific dates). Environmentally sensitive areas would be protected during drilling because they will be frozen and snow covered. Priority cleanup areas will be established in coordination with trustee agencies within the UC to ensure a timely and efficient cleanup.

Once a spill has occurred, an assessment team would be deployed, if appropriate, to survey the areas of the oil spill. The survey data would be analyzed to develop a list of components that could be included in a priority listing for protection and cleanup. These areas could potentially include subsistence areas, rivers, lakes, tundra, archaeological sites, and cultural sites. During this analysis, many factors would be considered. Table 1.6-4 depicts the typical analysis equation for gathering information to assess the relative priority of sites for protection and cleanup. Within a response, the IMT's Environmental Unit (EU) is tasked to prioritize sensitive areas for protection or a needed cleanup. The EU would involve resource trustees, groups, and individuals in this decision-making process. These entities would most likely include representation from local government and tribal representatives, environmentalists, biologists, scientists, state and federal agencies, and North Slope Energy. The EU would weigh the available sensitive area information, local knowledge of resources, field survey data, site conditions, response tactics, and other factors to propose a priority list for response operations and establish a final priority listing. The UC would determine the response strategies for protection and cleanup of these sites.

North Slope Energy's exploration operation will occur during winter and the environment is made up of completely frozen ground and water surfaces that would naturally preclude immediate impact to sensitive areas. In the event that a spill does impact the tundra or wetlands surrounding the pad, North Slope Energy would work within the UC to determine the best approaches and techniques for tundra cleanup and treatment. Through the UC, decisions on containment, recovery, and rehabilitation tactics for tundra

and wetlands would be consistent with the provisions of the *Tundra Treatment Guidelines*, Alaska Inland Area Contingency Plan, and Arctic and Western Alaska Area Contingency Plan. All North Slope Energy access routes and project areas will be surveyed and evaluated to ensure environmentally sensitive resources are not impacted by operations, if possible, or site-specific protective strategies will be developed and in place to mitigate potential damage.

Pre-identified sensitive areas that should be considered for priority protection for the planned drilling projects would be discussed in the site-specific addenda. Actual priorities would vary based upon the site-specific receiving environmental and incident-specific conditions.

Table 1.6-4
Typical Analysis Equation

Habitat Values	**+**	**Water Quality**	**+**	**Air Quality**	**+**	**Wildlife**	**+**	**Access**	**+**	
Cultural Values (Subsistence)	**+**	**Oil Characteristics**	**+**	**Physical Conditions**	**+**	**Operational Conditions**	**=**	**Priority List**		
		Meteorology (Snow Cover)		**Seasonality**		**Geography**				

Archeological surveys will be conducted for all areas where North Slope Energy plans to drill. Each site-specific addenda provides information as appropriate. No proposed exploration sites are located on Native allotments.

1.6.5 Containment and Control Strategies

Containment and control strategies are based primarily on physical and mechanical controls such as berms, barriers, and boom. Options for containment and control are discussed in the ACS Technical Manual, including Containment Using Snow Berm (C-1), Barriers on Land (C-4), Containment on Ice with Trenches and Sumps (C-11), Trenching Ice to Direct Flow to a Containment Point (C-12), and Containing Oiled Snow Using Snow Fence (C-19). Section 3.6.1 contains a list of the major response equipment that will be staged at the drill site. Refer to the site-specific addenda for a list of on-site equipment that can be used for containment tactics.

1.6.6 Recovery Strategies

Refer to the response scenarios contained in Section 1.6.12 for specific recovery procedures.

Mechanical recovery strategies are discussed in the ACS Technical Manual, including Mechanical Recovery of Lightly Oiled Snow (R-1), Use of Snow Blower to Remove Lightly Misted Snow (R-1A), Manual Recovery of Lightly Oiled snow (R-2), Recovery of Oil-Saturated Snow (R-3), Cutting Ice Slots for Recovery (R-13), Recovery of Oil under Ice (R-14), Hoses and Pumps in a Series (R-24), and Excavation and Storage of Oiled Gravel (R-26). Section 3.6.1 contains a list of the major response equipment that will be staged at the drill site. Refer to the site-specific addenda for a list of on-site equipment that can be used for containment tactics.

1.6.7 Lightering, Transfer, and Storage of Oil from Tanks

Depending on the spill situation, oil may need to be removed from a tank and transferred to temporary storage. Options for transfer and temporary storage include use of trash pumps, portable tanks, tanker trucks, and lined structures and containers. These options are discussed in the ACS Technical Manual, Tactic Hoses and Pumps in Series (R-24).

1.6.8 Transfer and Storage Strategies

As discussed above, transfer and storage strategies for onshore operations are discussed in the ACS Technical Manual, Tactics Hoses and Pumps in Series (R-24) and Storage and Disposal of Non-Liquid Oily Wastes (D-2).

1.6.9 Temporary Storage and Disposal

Temporary storage strategies for recovered liquids and contaminated snow are described in the ACS Technical Manual, Tactics Processing Recovered Liquids (D-1), Storage and Disposal of Non-Liquid Oily Wastes (D-2), Disposal of Non-Oily Wastes (D-3), Stockpiling Oiled Gravel (D-4), and Processing of Contaminated Snow/Ice (D-5). Temporary storage of oil, oily waste, and debris recovered during a spill cleanup may be provided by tanks, pits, or basins located at facilities near the site or at a facility coordinated through North Slope Energy through commercial agreements with other North Slope operators. For the purpose of this regional plan, recovered oily snow would be stored in interim, lined storage pits constructed at one of the existing gravel pads. North Slope Energy would request approval for the use of a temporary, lined storage pit through ADEC's Northern Area Response Team (NART).

Inigok Area Temporary Storage

For response in the Inigok Area, an existing, 7.5-acre gravel pad would be used for temporary storage of recovered oil and snow. This pad is connected to the Inigok Airstrip by an all-season gravel road. This pad can be accessed from all the planned wells via ice or snow road. One (1) 210 foot (ft) by 210 ft lined, containment pit with a 3-ft dike-wall would be sufficient for the estimated volume of recovered snow from a blowout. This pit would be stockpiled to a height of 30 ft using a bulldozer and require approximately 1 acre of space.

Snow-melting operations would be mobilized consisting of four (4) snow melters, two (2) front-end loaders, and a crew of sixteen (16) would commence snow-melting operations. Recovered liquids would be temporarily stored on the pad using twenty-four (24) 400-barrel (bbl) tanks mobilized to the Inigok Staging Area pad. The tanks will be placed within one (1) 80 ft by 100 ft lined containment cell with a 3-ft dike. The tanks will temporarily store oily water resulting from snow melt operations and offloaded to 300-bbl vacuum trucks to transport over armored snow/ice roads to an oil recycling facility or injection disposal facility located within 150 miles of Inigok Staging Area. An additional temporary storage will be constructed on an ice pad near Drill Site 2P (DS-2P) consisting of ten (10) 400-bbl tanks within one (1) 40 ft by 80 ft lined containment cell with a 3-ft dike. The DS-2P storage will be used for staging recovered liquids for retrieval and transport by 300-bbl vacuum trucks to one of the recycling or injection disposal facilities.

Upon completion of snow melting and removal of all the steel tanks containing oily water, the temporary, lined storage pit would be dismantled and transported to an approved disposal facility. Depending upon the specifics of the spill situation, North Slope Energy, and ADEC NART would determine the operational requirements for the interim, lined storage pit and tanks within containment, including pad site location, containment requirements, timing, snow-melting procedures, and removal. Storage pits would be properly lined and covered to protect wildlife. Tanks and containment areas storing recovered liquids would be inspected at least once per week by facility personnel throughout the interim storage timeframe until the liquids are removed and transported to an approved processing or disposal facility. All tanks over 10,000 gal in capacity would comply with the requirements of 18 AAC 75.066.

Based upon spill location, the nearest hydrocarbon processing facility presents another alternative for the temporary storage area for oiled snow and ice. The North Slope infrastructure offers extensive vacant pad locations at any given time. The movement of equipment and supplies to support routine field operations may result in changes to the accessibility of specific locations, but suitable alternative sites would be available. If additional emergency temporary storage is needed to augment the response operations, then the UC consisting of the North Slope Energy IC, Federal On-scene Coordinator (FOSC), State On-Scene Coordinator (SOSC), and Local On-scene Coordinator (LOSC) officials, would work with the appropriate North Slope operators to identify the best locations to establish a temporary storage facility.

The spill location or other logistical problems may require storage of oil, oily waste, and debris in smaller, more portable containers that can be brought to the scene via truck or aircraft. All potential temporary storage sites will be coordinated through commercial agreements for access to North Slope production facilities and the UC. North Slope operators and contractors maintain an extensive inventory of portable storage tanks and steel bins. Additional containers would be available through Tankco Alaska, Inc. on the North Slope or in an emergency through commercial agreements coordinated with North Slope operators.

Disposal Methods

The method of disposal for oil and contaminated materials from spill recovery operations (or for oily waste from normal operations) must be approved by the appropriate state and federal agencies. At the time of the spill, the Operations Section Chief, in consultation with the EU Leader, determines the reuse, recycling, or disposal method best suited to the state of the oil, the degree of contamination of recovered debris, and the logistics involved in these operations. Applications for agency approvals are completed before the determined method of disposal is implemented. An initial determination must be made regarding the classification of the waste as exempt, hazardous, or non-hazardous. This classification can be made on a case-by-case basis. The EU Leader assists in determining the classification if the status of the waste material is in question. In general, the following guidelines apply:

- Spilled material that comes out of a well, either during drilling or workover operations, is exempt and therefore non-hazardous. Spilled material that did not come out of a well may not be exempt and may need to be tested to determine if the material to be disposed of is hazardous.
- Spills that occur from filling a tank (e.g., vehicle, storage) are non-exempt, even though they may occur on a well pad. These spilled materials must be tested to determine if the material to be disposed of is hazardous.

Additionally, North Slope Energy also will have a Ballot agreement with the Prudhoe Bay Unit (PBU) for the disposal of drill cuttings and mud at Drill Site #4 Grind and Injection Facility.

1.6.10 Wildlife Protection

Wildlife protection strategies may entail, in order of priority: (1) contain, control, and cleanup all the oil possible to preclude wildlife impacts; (2) hazing of birds and mammals away from the spill; and (3) capture and relocation of wildlife at direct threat. These options are discussed in Section 3.10, Environmental Protection.

1.6.11 Shoreline Cleanup

Shoreline cleanup operations are not applicable to the winter exploration well operations that will take place on land. Winter spill response strategies are designed to remove all contaminated snow and ice on and surrounding coastal waters, lakes, and rivers before breakup high water flow periods.

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1.6.12 Spill Response Scenarios

Cross-reference:

18 AAC 75.425(e)(1)(F) and (I)

ACS Technical Manual, Volume 1, Tactic Descriptions

Alaska Inland Area Contingency Plan

Arctic and Western Alaska Area Contingency Plan

Tundra Treatment Guidelines – A Manual for Treating Oil and Hazardous Substance Spills to Tundra

The scenarios are for illustration only and are not representative of performance standards or a guarantee of performance. The scenarios assume conditions of the spill and responses only to display general procedures, strategies, tactics, and selected operational capabilities. Although some specific equipment is named, it may be replaced by functionally similar equipment in the future. The response times and sequences are for illustration only and do not limit the discretion of the persons in charge of the spill response to select any sequence or take whatever time they deem necessary for an effective response without jeopardizing safety and health. Actual response performance as illustrated in the scenario is not guaranteed. Weather, equipment malfunctions, and human performance can compromise efficiency. As a result, actual response may differ from a theoretical, desktop planning model. Experience shows that a catastrophic spill would result in a long-term cleanup, which would be completed in the "shortest possible time."

In any accident, considerations to ensure the safety and health of personnel will be given highest priority. The scenario assumes the agency on-scene coordinators and other agency officials will expeditiously grant any permits required for proper spill response.

The scenarios are presented in tabular form as listed below.

- Scenario Conditions
- Response Strategy
- Recovery and Handling Capability
- Personnel and Equipment for Operation

Scenario 1

Scenario 1 describes a hypothetical blowout response occurring from the most distant well location in the Inigok Area vicinity during winter. The exploration well is accessible via ice and snow roads approximately 94 miles from existing DS-2P connecting to all-season gravel roads. In the event of a major spill, snow roads would be armored by adding snow and water spray with ice to increase thickness and maintain durability to support use by conventional heavy equipment, such as vacuum trucks and dump trucks, and support logistics. Existing gravel pads with gravel roads to the nearby Inigok Airstrip will be utilized to provide an interim agency-approved storage area that are large enough to allow for stockpiling of recovered contaminated snow and storage of oil in tanks and covered, lined pits. The contaminated snow would be handled and processed after melting (either by artificial means or natural melting). Recovered liquids would be transported from the affected well location to one of the hydrocarbon recycling and injection disposal facilities located within 170 miles of the well.

A timeline for Scenario 1, including task force designations and tactic references, is presented in Figure 1.6-1.

Response Strategy 1

Response Strategy 1 describes a hypothetical spill from the rig fuel tank at an exploration site during winter with snow/ice road access.

SCENARIO 1
Inigok Area Exploration Well
Blowout During Winter

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Figure 1.6-1 Scenario 1 Timeline

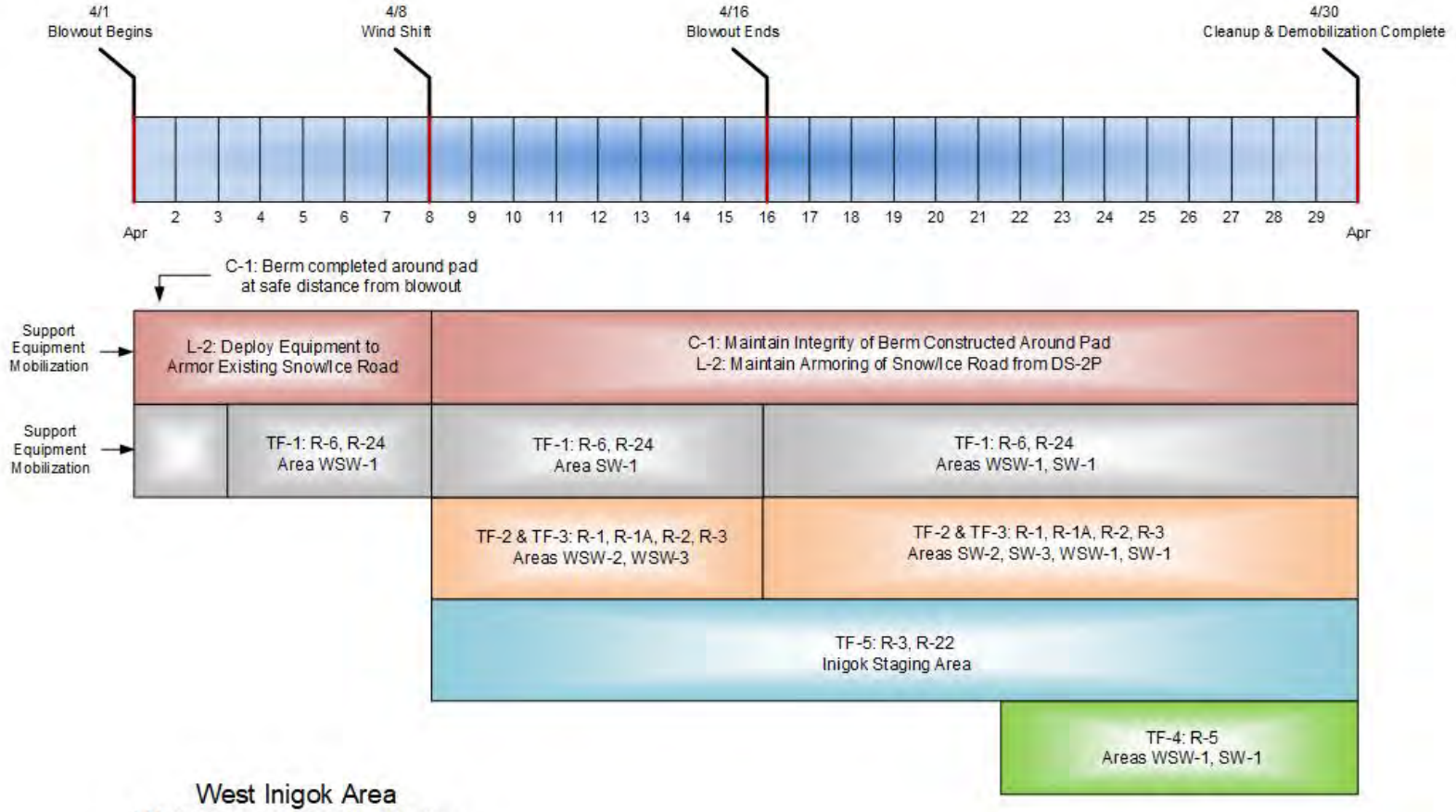

Figure 1.6-1 Scenario 1 Timeline

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Table 1.6-5
Scenario 1 Conditions – West Inigok Area Exploration Well Blowout during Winter

Parameter	Initial Conditions	Cross Reference
Spill Location	West Inigok Area Exploration Well	Not Applicable (N/A)
Date	April 1, 6:00 a.m.	N/A
Duration	15 days	Section 1.6.1
Type of Spill	Uncontrolled, well blowout through an open orifice.	N/A
Quantity of Oil Spilled	5,500 barrels (bbl)/day for 15 days=82,500 bbl (600 gas-to-oil ratio [GOR]).	Part 5
Oil Type	Alaska North Slope Crude Oil	N/A
Wind Speed	Variable from 5 to 25 knots	N/A
Wind Direction	**Days 1 – 7:** West-southwest plume (wind from east-northeast) **Days 8 – 15:** Southwest plume (wind from northeast)	Figure 1.6-2, Nuiqsut Airfield Wind Rose Lat.: 70.209833 N Long.:151.0064722 W Elevation: 45 feet (ft) https://www.ncdc.noaa.gov/
Current	N/A	N/A
Weather Conditions	Temperature: -2° Fahrenheit; Visibility: greater than 5 miles	N/A
Surface	The exploration well drill site is approximately 18 snow/ice road miles from the Inigok Staging Area and 5,000-ft gravel airstrip or about 94 miles from DS-2P and existing gravel road infrastructure. Surrounding surface is frozen tundra/ice. Snow depth is 0–36 inches; average 12 inches. Armored snow/ice roads support conventional vehicles and heavy equipment until April 30.	N/A
Trajectory	The simulated discharge oil is ejected through a 6.3-inch internal diameter well into the air at a 600 GOR. Using the 1997 S.L. Ross model, the simulated oil takes the form of an aerial plume extending from the well in the direction of the wind; 10% of the oil is assumed to be in the form of drops so small (50 micrograms or less) that they do not fall to the ground but are held aloft by atmospheric turbulence. For response planning purposes, this 10% predicted by the S.L. Ross model to remain airborne is proportionally distributed between the recovery zones. On Days 1-7, approximately 34,220 bbl (80%) of oil falls on the ice pad and adjacent area within 650 ft of the well. All of the oil that falls on the ice pad remains on the pad or flows off the pad and collects behind snow berms constructed for containment at a safe distance from the plume. The remainder (4,280 bbl) of the oil falls to the frozen snow-covered ground in a very thin layer at a distance of up to 4,510 ft from the well. (See Figure 1.6-3, Blowout Plume Winter Scenario. On Days 8-15, approximately 39,110 (80%) of oil falls to the ice pad and adjacent area within 650 ft of the well and collects behind containment berms. The remainder (4,890 bbl) falls to the frozen snow-covered ground within 4,510 ft of the well.	S.L. Ross 1997 Figure 1.6-3 Blowout Plume Winter Scenario

bbl = barrel(s)
ft = foot/feet
GOR = gas-to-oil ratio
N/A = not applicable

Figure 1.6-2 Wind Rose

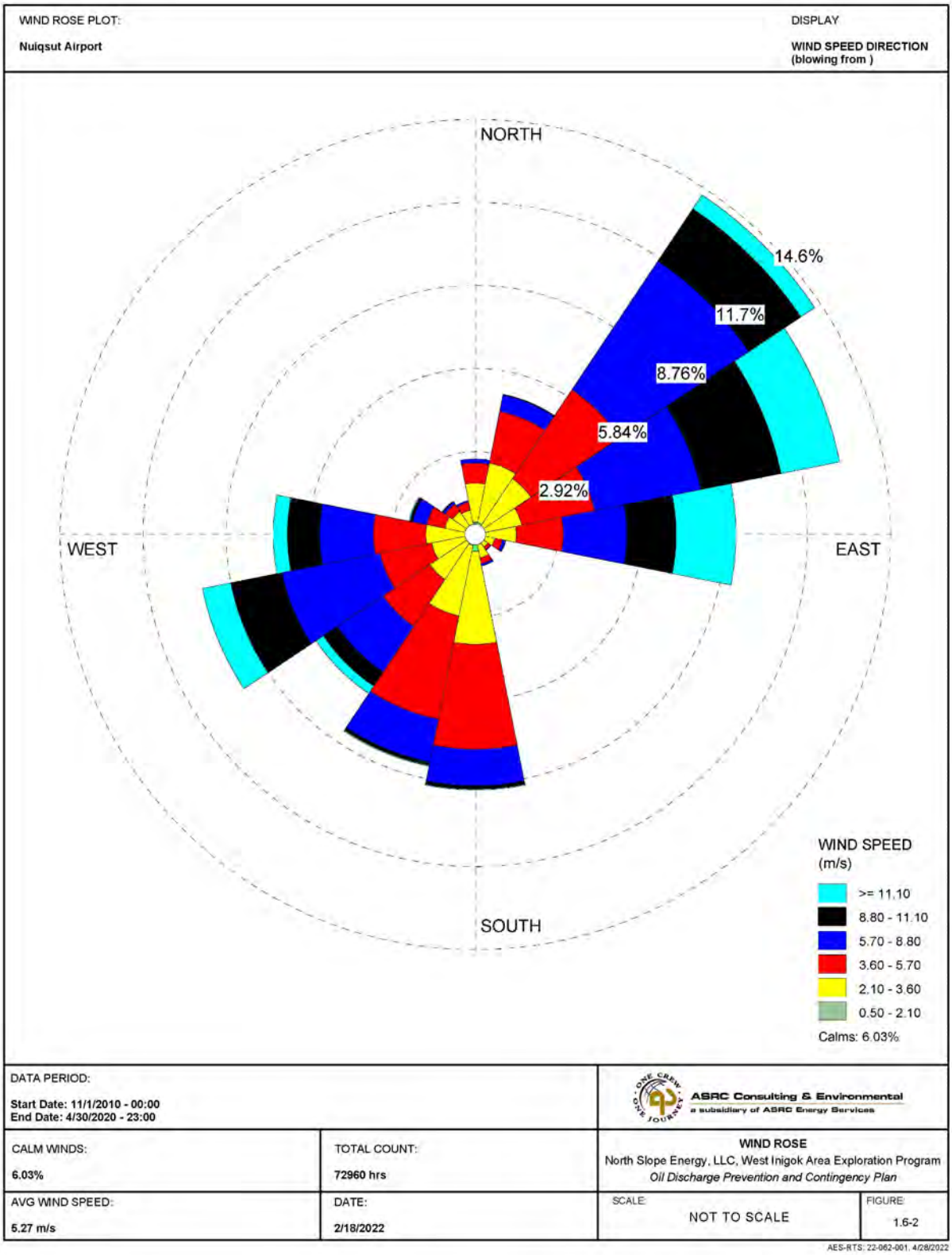

Figure 1.6-3 Blowout Plume Winter Scenario

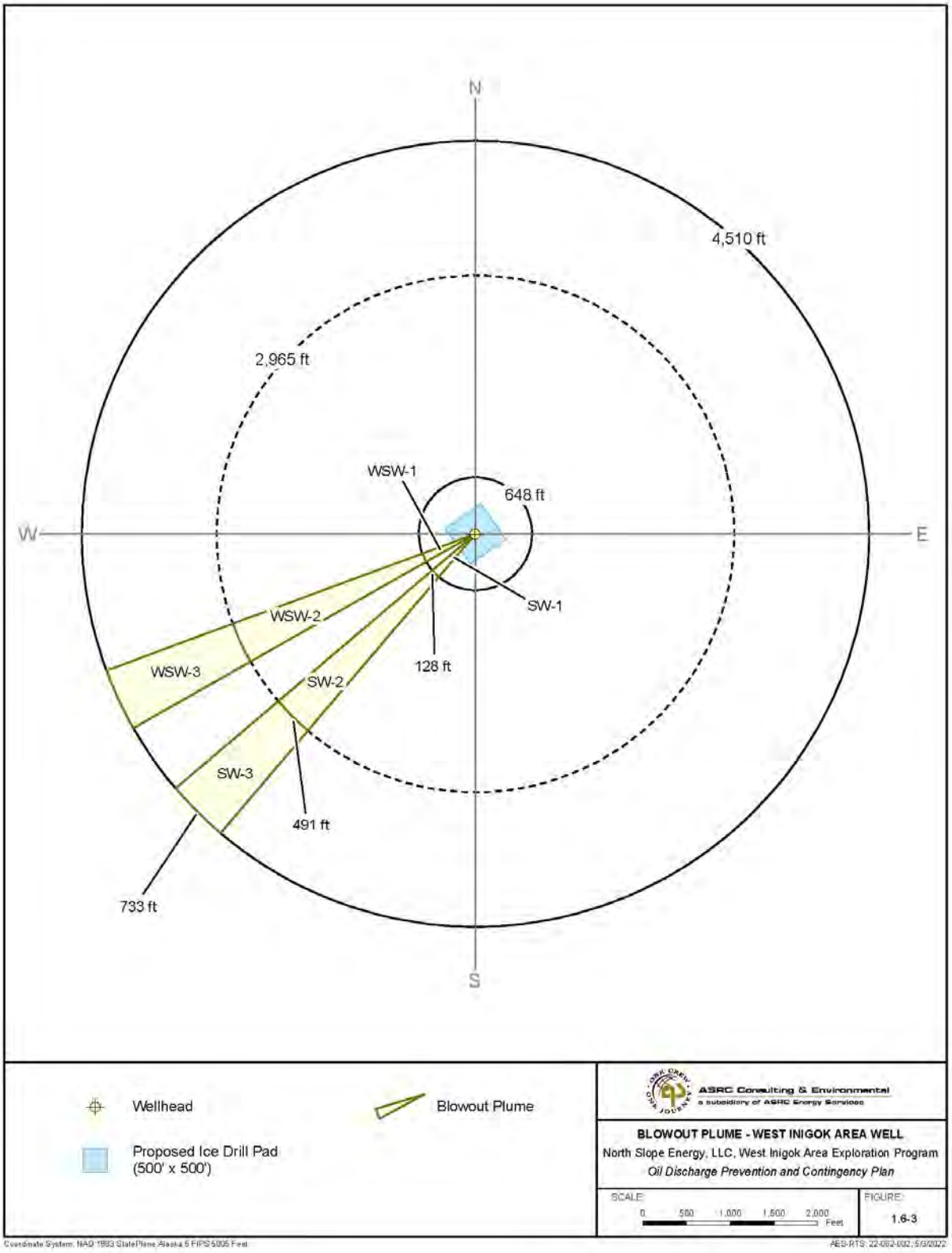

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Table 1.6-6
Scenario 1 Response Strategy – West Inigok Area Exploration Well Blowout during Winter

ADEC Requirement	Response Strategy	ACS Tactic
(i) Stopping Discharge at Source	As soon as the well kicks, subsurface well control is initiated (increasing mud weight, blowout prevention techniques activated). Initial attempts fail and the exploration well is now classified as an "unobstructed" blowout well (T+00 hour). It has a continuous flow rate of 5,500 barrels of oil per day (bopd). Personnel are evacuated when control is not immediate and safety is at risk. The North Slope Energy Drill Site Manager notifies the on-site Spill Technician. All notifications to appropriate personnel and agencies are made (see Section 1.1 of core plan, Immediate Response Checklist) and the Incident Command System is activated. ACS is mobilized at T+02 hours. North Slope Energy Drill Site Manager notifies Wild Well Control to coordinate well-control operations (see Section 1.2.3 for contact information). Wild Well Control mobilizes additional well control specialists and equipment from Houston. Wild Well Control well specialists arrive within 48 hours. Surface methods control the blowout on Day 15 (refer to Section 1.6.1 for well-capping timeline and control strategies).	Sections 1.1 and 1.2 Refer to Section 1.6.1 of this plan
(ii) Preventing or Controlling Fire Hazards	The North Slope Energy Drill Site Manager and on-site Safety Officer ensure all sources of ignition are shut off and locked out or removed from the area. An exclusion zone is established by the on-site Safety Officer approximately 1,000 ft from the source. All personnel are briefed about this exclusion zone. The on-site Safety Officer establishes personal protective equipment requirements for entering the exclusion zone. All zones and contaminated areas surrounding the drill pad are designated as control zones and security procedures are established. Non-essential personnel are placed as control "guards". The on-site Safety Officer and on-site Spill Technician set up a monitoring protocol to ensure personnel protection. Winds are monitored and Lower Explosive Limits (LELs) are measured. Decontamination zones are established. Containment and recovery operations are allowed without respiratory protection in areas where safety criteria are met. Recovery operations and traffic are disallowed downwind of the blowout well in areas where workers may become exposed to flash fire hazard or oil particulate matter at concentrations in excess of permissible exposure limits. Fire suppression coverage is set up.	S-1 through S-6
(iv) Surveillance and Tracking of Oil	Blowout plume is monitored using existing and forecast winds. Weather forecasts from the National Weather Service are received hourly (refer to Figure 1.6-2). The extent of oil on the snow is mapped and delineated, in the event that further snowfall or winds cover the already existing snow.	S-1, S-2, T-7 Figure 1.6-2
(v) Exclusion Procedures	The Environmental Unit Leader consults the Geographic Information System (GIS) database on environmental sensitivities and cultural resources and identifies no priority protection sites or areas of concern for winter season. The ASRC database contains satellite photography of the project area. Oil falling to the ice pad surface and snow-covered ground largely remains in place because of snow absorption and the below-freezing temperatures. No open water is present within the fallout zone of the plume.	Refer to Addendum A, Table A3-3, Figures A3-1 through A3-7

Table 1.6-6
Scenario 1 Response Strategy – West Inigok Area Exploration Well Blowout during Winter

ADEC Requirement	Response Strategy	ACS Tactic
(vi) Spill Containment and Control Actions	Days 1 through 3	
	• Upon initial reports of an imminent blowout, North Slope Energy initiates ice hardening (armoring) of snow roads between DS-2P and the exploration well pad. ACS begins preparing containment and recovery equipment from the Deadhorse, Prudhoe Bay, and Kuparuk areas. A staging area is established on Day 1 at the Inigok Staging Area pad. A field command post is established at the Inigok Staging Area and equipment is transported to the staging area.	Section 1.5 Figure 1.6-4
	• Snow containment berms are built around the perimeter of the well's ice pad at a safe distance from the blowout trajectory to reduce the spread of oil and provide initial containment (Figure 1.6-4). One (1) loader with bucket begins building a snow containment berm starting from the pad access road and continuing around the sides of the pad. To the extent safety permits, the berms are completed within 24 hours to encircle the pad and contain the spill.	C-1, C-4, C-11, C-12, C-19
	• Armoring of the existing snow road to the Inigok Staging Area and well site is initiated on Day 2 from DS-2P gravel road to provide access for conventional heavy equipment and response resources. Snow road armoring is performed by adding snow and ice chips to smooth the route, saturating it with water to freeze and capping with water to increase thickness and create a durable, hardened surface to support use by conventional heavy equipment, such as vacuum trucks and dump trucks, and support logistics. Water tankers, loaders, and graders would be used to armor the existing snow/ice road.	L-1
	• Two (2) Steiger tractors with blades are mobilized to the pad on Day 2 to assist construction of and maintenance of the containment berms around the pad and other areas needing protection. The equipment will remain outside of the safety exclusion zone away from the plume and maintain the snow berm as necessary.	C-1
	• Recovery equipment and deployment time are calculated in in Table 1.6-7. The equipment for recovery, transfer, and interim storage of oiled snow and recovered oil is transported to the spill site via snow road by Day 3. Armoring of snow/ice roads is completed by Day 8.	Table 1.6-7

Table 1.6-6
Scenario 1 Response Strategy – West Inigok Area Exploration Well Blowout during Winter

ADEC Requirement	Response Strategy	ACS Tactic
(vii) Spill Recovery Procedures	Days 3 through 7 On Days 3 through 7, the wind blows from the east-northeast directing the plume to the west-southwest (Areas WSW-1, WSW-2, and WSW-3). • Task Force 1 (TF-1): On Day 3 (T+3 days), TF-1 consisting of fourteen (14), Steigers towing 240-bbl tanks, begin recovery of accumulated liquid oil on and along the edge of the pad contained within the berm. Recovery is conducted with continuous monitoring of LELs and prevailing wind conditions at a safe distance from the source and fallout plume. Six (6) crews set up six (6) 3-inch pumps with a de-rated recovery rate of 286 gpm, each equipped with 200 ft of suction hose and 600 ft of discharge hose and six (6), 5,000-gal portable tanks, to assist in reaching recovery locations greater than 200 ft from access points. The fourteen (14) Steigers with tanks carry recovered oil to DS-2P and offload fluids into (10) 400-bbl tanks setup within containment. Six (6) 300-bbl vacuum trucks offload liquids from 400-bbl tanks staged at DS-2P and transport recovered liquids to one of the facilities located within 75 miles for hydrocarbon recycling or injection disposal. Crews recover approximately 50% of the accumulated free liquids on the pad and area near the pad's perimeter (Area WSW-1) are recovered by Day 7. Targeted Recovery = 17,110 bbl of oil Days 8 through 15 On Days 8 through 15, the wind blows from the northeast directing the plume to the southwest (Areas SW-1, SW-2, and SW-3). Conventional vacuum trucks, end dumps, and loaders arrive at the spill site over armored snow/ice roads originating from DS-2P. • TF-1: On Day 8 (T+8 days), TF-1, consisting of twenty (20) 90-bbl vacuum trucks, four (4) 30-cu yd end dump trucks, and four (4) loaders, continues recovery of liquid oil on and near the pad. Work with continuous monitoring of the LELs and prevailing wind conditions at a safe distance from the source and fallout plume, ten (10) crews use ten (10) 3-inch pumps with a recovery rate of 286 gpm, each equipped with 200 ft of suction hose and 600 ft of discharge hose, and ten (10), 5,000-gal tanks, to assist the vacuum units in reaching recovery locations greater than 200 ft from access points. The vacuum trucks transport recovered oil to one of the processing facilities located within 170 miles for hydrocarbon recycling. Approximately 50% of the accumulated free liquids on the pad and areas along the pad's perimeter (Area SW-1) are recovered by Day 15. Targeted recovery = 17,110 bbl of oil. • Task Force 2 (TF-2): On Day 8 (T+8 days), TF-2 begins recovery of heavily and lightly oiled snow in Areas WSW-2 and WSW-3 (Figure 1.6-3). TF-2 is comprised of two (2) crews of response personnel and equipment arriving via existing gravel roads and armored ice/snow roads from Kuparuk, Prudhoe Bay, and Deadhorse. Two (2) front-end loaders with four (4) 30-cu yd dump trucks haul oiled snow to lined containment constructed at the Inigok Staging Area pad located within 18 miles. Loaders and dump trucks are shared among TF-2 and TF-3 teams. Targeted Recovery = 1,805 cu yd of oiled snow. • Task Force 3 (TF-3): On Day 8 (T+8 days), TF-3, working in conjunction with TF-2, begins recovery of lightly oiled snow in Areas WSW-2 and WSW-3. TF-3 is comprised of two (2) manual labor crews using hand tools, two (2) snow blowers and two (2) snowmachines towing containers for transferring oiled snow to two (2) dump trucks shared with TF-2. TF-3 (in conjunction with TF-2) would recover all contaminated snow in Areas WSW-2 and WSW-3 by end of Day 15.	Refer to Tables 1.6-7, 1.6-8, 1.6-9,1.6-10 R-6, R-24 R-6, R-24 R-1, R-2, R-3 R-1, R-1A R-2 R-1A

Table 1.6-6
Scenario 1 Response Strategy – West Inigok Area Exploration Well Blowout during Winter

ADEC Requirement	Response Strategy	ACS Tactic
(vii) Spill Recovery Procedures (continued)	Days 16 through 28 On Day 16, well capping operations are completed and the oil flow is stopped. • TF-1: On Day 16 (T+16 days) TF-1 consisting of fourteen (14) 300-bbl vacuum trucks begins recovery of the remaining liquid oil from Areas WSW-1 and SW-1 on the pad. Crews recover the accumulated free liquids in Areas WSW-1 and SW-1 by Day 22. Targeted Recovery = 36,650 bbl of oil. • TF-2: On Day 16 (T+16 days), TF-2 begins recovery of heavily and lightly oiled snow in Areas SW-2 and SW-3 (Figure 1.6-3). TF-2 is augmented with additional response personnel and equipment arriving via existing gravel roads and ice/snow roads from Prudhoe Bay and Deadhorse. Four (4) front-end loaders with twelve (12) 30-cu yd dump trucks haul oiled snow to lined containment constructed at the Inigok Staging Area. Loaders and dump trucks are shared among TF-2 and TF-3 teams. Targeted Recovery = 1,805 cu yd of oiled snow. • TF-3: On Day 16 (T+16 days), TF-3, working in conjunction with TF-2, begins recovery of lightly oiled snow in Areas SW-2 and SW-3. TF-3 is comprised of two (2) manual labor crews using hand tools, two (2) snow blowers, and two (2) snowmachines towing containers for transferring oiled snow to two (2) dump trucks shared with TF-2. TF-3 (in conjunction with TF-2) would recover all contaminated snow in Areas SW-2 and SW-3 by the end of Day 16. • TF-2: On Day 17 (T+17 days), TF-2 begins recovery of heavily oiled snow in Areas WSW-1 and SW-1 (Figure 1.6-4). Four (4) front-end loaders with twelve (12) dump trucks are shared among TF-2 and TF-4. Targeted Recovery = 15,293 cu yd or oiled ice and snow. • Task Force 4 (TF-4): On Day 17 (T+17), TF-4 consists of a loader-mounted trimmer to remove the oiled ice on the pad. TF-4 works in conjunction with TF-2 loaders and end dumps complete recovery of all oil embedded snow and ice by the end of Day 22. • Task Force 5 (TF-5): TF-5 consists of four (4) snow-melting units operating at the rate of 30 cu yd / hour. Snow-melting units are supported by four (4) loaders with buckets to manage snow stockpiling and snow-melt operations. Snow-melting operations are completed by Day 28. • Task Force 5 (TF-5): TF-5 consists of four (4) 300-bbl vacuum trucks to transport snow melt fluids from Inigok Staging Area's 400-bbl tanks to one of the facilities located within 150 miles for hydrocarbon recycling or injection disposal. Vacuum truck operations are completed by Day 30.	R-6, R-24 R-1, R-2 R-3 R-1, R-1A R-2 R-3 R-5 R-1, R-1A, R-3 R-22
(viii) Lightering Procedures	Not applicable	N/A

Table 1.6-6
Scenario 1 Response Strategy – West Inigok Area Exploration Well Blowout during Winter

ADEC Requirement	Response Strategy	ACS Tactic
(ix) Transfer and Storage of Recovered Oil/Water; Volume Estimating Procedure	Oiled snow is loaded into the dump truck for transport to lined storage areas constructed at Inigok Staging Area pad located approximately 18 miles where four (4) snow-melting units are operating to convert to oil/water liquids. These liquids are temporarily stored in twenty-four (24) 400-bbl tanks within containment.	R-1, R-2, R-3, and R-5
	Steiger tractors towing 240-bbl tanks are used initially to transport recovered oil over snow roads. Equipment is mobilized to armor road surfaces by capping and thickening using snow, ice chips and water. Once the snow/ice road is fully armored and hardening, 90-bbl vacuum trucks are deployed to continue oil recovery operation. Finally, 300-bbl vacuum trucks are mobilized once the snow/ice road fully stabilizes for transporting recovered oil to travel between the recovery site to DS-2P,where gravel road infrastructure connects to one of the facilities located within 150 miles of Inigok Staging Area for hydrocarbon recycling of disposal.	D-1, D-2, D-3 D-2
	Containment areas are constructed of Seaman 8228 ORLTA and/or XR-5 8130 geomembrane obtained from Polar Supply in Anchorage; additional supplies can be mobilized during the 15-day blowout control period.	T-7
	Stored oil and oily water (inclusive of meltwater from snow) shall be gauged and recorded for volume estimation prior to treatment or final disposal. The method of transfer, temporary storage, and final disposal of recovered product shall be reviewed and approved by ADEC as a component of the incident-specific Waste Management Plan.	
(x) Plans, Procedures, and Locations for Temporary Storage and Ultimate Disposal	Oiled snow would be stored in interim lined and covered storage cells constructed at the existing Inigok Staging Area pad. The oiled snow would be stacked in one (1) 210 ft by 210 ft lined containment with a 3-ft dike wall. The contaminated snow will occupy an estimated rectangle of one (1) acre.	D-5
	Twenty-four (24) 400-bbl tanks will be mobilized to the Inigok Staging Area pad and placed within one (1) 80 ft by 100 ft lined containment with a 3-ft dike. The tanks will temporarily store the estimated 9,452 bbl of oily water resulting from snow-melting operations. Four (4) vacuum trucks will transport liquids from snow melting to oil recycling facilities or injection disposal facilities located within 150 miles of Inigok Staging Area for hydrocarbon recycling.	D-1
	All storage pits and liquid containers are monitored until all contents have been processed. Non-liquid oily wastes are classified and disposed of according to classification.	D-1, D-2
	Non-oily wastes are classified and disposed of accordingly.	
	The method of transfer, temporary storage, and final disposal of recovered product shall be reviewed and approved by ADEC as a component of the incident-specific Waste Management Plan.	D-5
(xi) Wildlife Protection Plan	A qualified wildlife monitor/hazer deters birds and mammals from the oiled areas.	W-1, W-2A, W-5
(xii) Shoreline Cleanup Plan	Not applicable. No oil reaches the shoreline.	N/A

North Slope Energy = North Slope Energy, LLC
ACS = Alaska Clean Seas
bbl = barrel(s)
bopd = barrels of oil per day
cu yd = cubic yard(s)
EU = Environmental Unit
ft = feet/foot
GIS = geographic information system
gpm = gallons per minute
LEL = Lower Explosive Limit
mi = mile(s)

Figure 1.6-4 Winter Blowout Containment Strategy

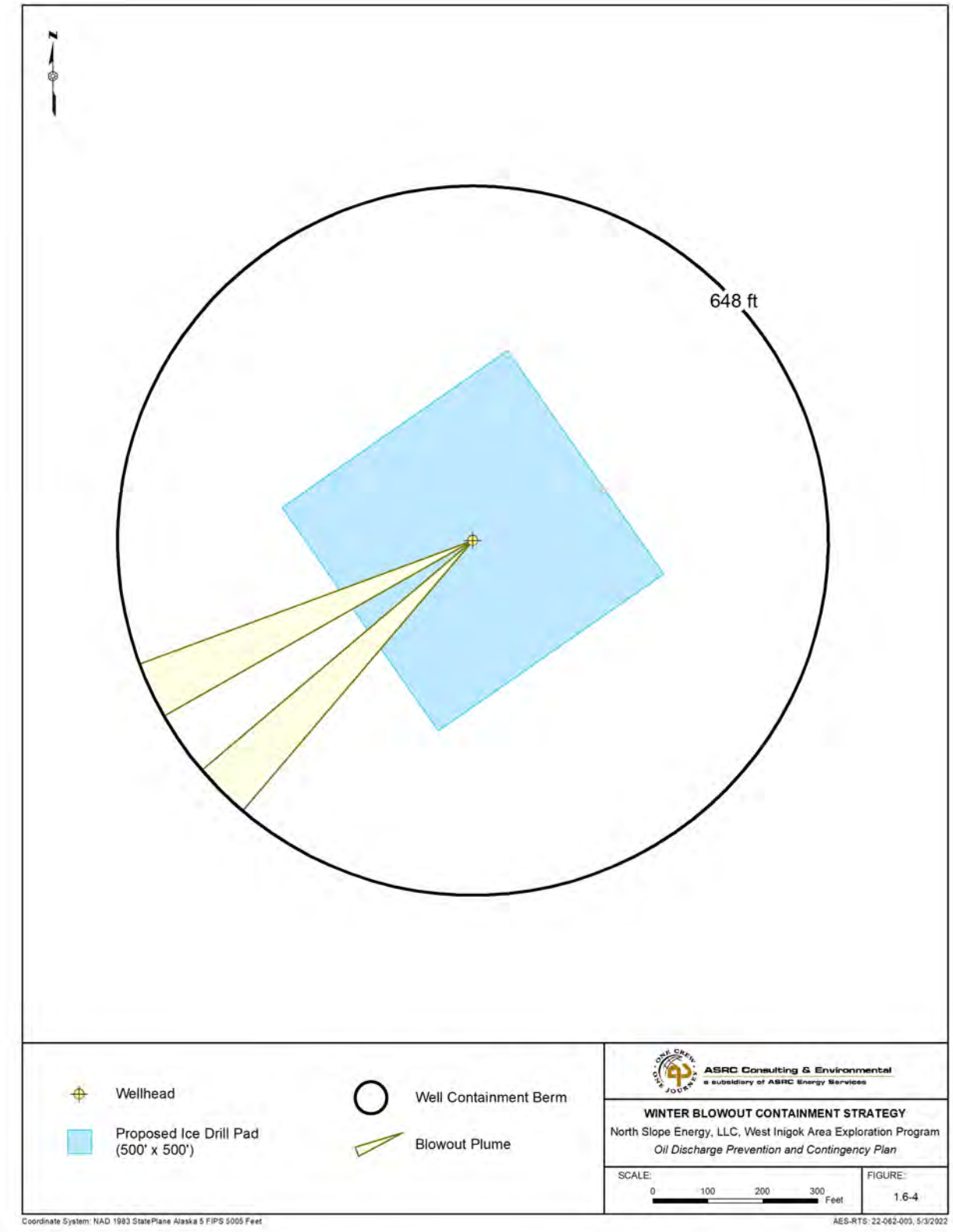

Table 1.6-7
Scenario 1 Recovery and Handling Capability – West Inigok Area Exploration Well Blowout during Winter with Snow/Ice Road Access

A Spill Task Force[1]	B Number of Systems[2]	C Recovery System	D Oiled Snow Recovery Rate[3,4,5,6,7,8] (cubic yards per hour or barrels of oil per hour)	E Mobilization and Transit Time to Site[9] (hours)	F Operating Time (hours per day)	G Handling Capacity (cubic yards per day or barrels of oil per day) B x D x F	H Amount of Contaminated Snow/Liquid (cubic yards or barrels)	I Days to Clean Up
Beginning of Day 3								
TF-1 (Area WSW-1)	14	Steiger Tractors with 240-bbl Tank	9.7	24	20	2,716	17,110	6.3
	6	Vacuum Truck, 300-bbl	36.2	24	20	4,345	17,110	3.0
Beginning of Day 8								
TF-1 (Area SW-1)	20	Vacuum Truck, 90-bbl	5.9	24	20	2,360	17,110	7.3
TF-2 (Area WSW-2)	2	Front-end Loaders & Dump Trucks	20.7	24	20	828	1,059	1.3
TF-2, TF-3 (Area WSW-3)	2	Front-end Loaders & Dump Trucks	20.7	24	20	828	746	0.9
Beginning of Day 16								
TF-1 (Areas WSW-1 & SW-1)	14	Vacuum Truck, 300-bbl	19.6	24	20	5,488	36,650	6.7
TF-2 (Area SW-2)	6	Front-end Loaders & Dump Trucks	20.7	24	20	2,484	1,059	0.4
TF-2, TF-3 (Area SW-3)	6	Front-end Loaders & Dump Trucks	20.7	24	20	2,484	746	0.3
TF-2, TF-4 (Area WSW-1)	6	Front-end Loaders, Dump Trucks & Trimmer	20.7	24	20	2,808	7,137	2.9

Table 1.6-7
Scenario 1 Recovery and Handling Capability – West Inigok Area Exploration Well Blowout during Winter with Snow/Ice Road Access

A Spill Task Force[1]	B Number of Systems[2]	C Recovery System	D Oiled Snow Recovery Rate[3,4,5,6,7,8] (cubic yards per hour or barrels of oil per hour)	E Mobilization and Transit Time to Site[9] (hours)	F Operating Time (hours per day)	G Handling Capacity (cubic yards per day or barrels of oil per day) B x D x F	H Amount of Contaminated Snow/Liquid (cubic yards or barrels)	I Days to Clean Up
TF-2, TF-4 (Area SW-1)	6	Front-end Loaders, Dump Trucks & Trimmer	20.7	24	20	2,484	8,156	3.2
TF-5 (Snow Melting at Inigok Staging Area pad)	4	Snow Melters	30	24	20	2,400	18,903	7.9
TF-5 (Oil/water mixture from Inigok Staging Area)	5	Vacuum Truck, 300-bbl	21.4	24	24	2,140	9,452	4.4
Total Liquid	-	-		-	-	-	**73,330**	**24.7**
Total Snow	-	-	-	-	-	-	**18,903**	**16.9**

Notes for Table 1.6-7, Recovery and Handling Capability —Inigok Area Exploration Well Blowout during Winter with Snow/Ice Road Access

1. TF-1 would begin recovery on Day 3 in Area WSW-1 in safe areas with continuous monitoring of LELs and weather conditions; approximately 50% of the accumulated fluid is recovered by pump crews to twelve (12) Steiger Tractors with 240-bbl tanks in WSW-1 and on the pad. Recovery of free liquids would begin in Area SW-1 on Day 16 after the well is controlled until all free liquids are recovered by Day 21.

2. The number of systems is based on the removal method. For Days 3 to 7, TF-1 is based on the number of Steiger tractors hauling 240-bbl tanks and includes six (6) crews consisting of three (3) workers each who set up and operate six (6) 3-inch positive displacement pumps each equipped with 200 ft of suction hose and 600 ft of discharge hose, and six (6) portable tanks to assist the Steiger and tank units in reaching recovery locations greater than 200 ft. For Days 8 to 15, TF-1 is based on the number of 90-bbl vacuum units in combination with ten (10) crews consisting of three (3) workers each who set up and operate ten (10) 3-inch positive displacement pumps each equipped with 200 ft of suction hose and 600 ft of discharge hose, and ten (10) portable tanks. TF-2 is based on number of dump trucks. For TF-3, it includes two (2) crews consisting of six (6) workers who operate using hand tools, two (2) snow blowers and two (2) snowmachines towing containers for transferring oiled snow to two (2) dump trucks shared with TF-2. For Days 16 and beyond, TF-1 is based on the number of 300-bbl vacuum units in combination with six (6) crews consisting of three (3) workers each who set up and operate six (6) 3-inch positive displacement pumps each equipped with 200 ft of suction hose and 600 ft of discharge hose, and six (6) portable tanks. TF-2 is based on number of dump trucks. For TF-3, it includes two (2) crews consisting of six (6) workers who operate crews using hand tools, two (2) snow blowers and two (2) snowmachines towing containers for transferring oiled snow to two (2) dump trucks shared with TF-2. TF-4 consists of a loader-mounted ice trimmer used to remove the oil ice pad surface to complete the cleanup.

3. For Days 3 to 7, TF-1 recovery rate is based on a maximum distance of 170 miles from the well to one of the hydrocarbon processing facilities for recycling or grind-and-inject facilities for disposal, including 94 miles from the well site to DS-2P where 400-bbl tanks are staged for offloading and 75 miles from DS-2P to the Drill Site 4 (DS-4) Grind & Inject Facility. The recovery rate for Steiger tractors with 240-bbl tanks includes a round-trip travel to DS-2P of 23.5 hours at 8 mph on armored snow/ice roads plus 1.2 hours for loading and offloading time. Assumed loading and unloading rate using de-rated 3-inch pumps in winter is 408 bbl/hour (268 gpm). Recovery Rate = Tank Unit Capacity / [(Distance to Unload X 2 / Speed mph) + (2 X Tank Unit Capacity / Winter Pumping Rate)] or 240 bbl / [(94 mi X 2 / 8 mph) + (2 X 240 bbl / 408 bbl/hour)] = 9.7 bbl/hour. The recovery rate for 300-bbl vacuum trucks from DS-2P to the DS-4 Grind & Inject Facility includes a round-trip travel of 4.3 hours at 35 mph on gravel roads plus 4 hours for loading and unloading at a derated rate of 150 bbl or 300 bbl / [(75 mi X 2 / 35 mph) + (2 X 300 bbl / 150 bbl/hour)] = 36.2 bbl/hour.

4. For Days 8 to Day 16, TF-1 recovery rate is based on a maximum distance of 170 miles from the well to one of the hydrocarbon processing facilities for recycling or grind- and-inject facilities for disposal. The recovery rate for 90-bbl vacuum trucks includes a round-trip travel of 11.3 hours at 30 mph on armored snow/ice roads plus 4 hours for loading and offloading time. Recovery Rate = Vacuum Unit Capacity / [(Distance to Unload X 2 / Speed mph) + (2 X Vacuum Unit Capacity / Winter Pumping Rate)] or 90 bbl / [(170 mi X 2 / 30 mph) + (2 X 90 bbl / 45 bbl/hour)] = 5.9 bbl/hour.

5. For Days 8 to Day 15, TF-2 and TF-3 recovery rates are based on a 30-cu yd end or side dumps traveling a distance of 18 road-miles from the spill location to the Inigok Staging Area where snow-melting equipment and temporary storage tanks are staged to process oily snow. Recovery rate for contaminated snow includes time for loading (0.17 hour), unloading (0.08 hour) and round trip transit to storage area. Recovery Rate = Dump Truck Capacity / [Load Time + (distance to unload X 2 / truck speed mph) + Unload Time or 30 cu yd / [0.17 hour + (18 mi X 2 / 30 mph) + 0.08 hour.] = 20.7 cu yd / hour.

6. For Days 8 to cleanup completion, TF-2 and TF-3 recovery rates are based on a 30-cu yd end or side dumps traveling a distance of 18 road-miles from the spill location to the Inigok Staging Area where snow-melting equipment and temporary storage tanks are staged to process oily snow. Recovery rate for contaminated snow includes time for loading (0.17 hour), unloading (0.08 hour) and round trip transit to storage area. Recovery Rate = Dump Truck Capacity / [Load Time + (distance to unload X 2 / truck speed mph) + Unload Time or 30 cu yd / [0.17 hour + (18 mi X 2 / 30 mph) + 0.08 hour.] = 20.7 cu yd / hour.

7. For Days 8 to cleanup completion, TF-5 consists of snow melting operations established using the Inigok Staging Area for temporary storage of recovered oily snow. Based upon Tactic R-1 and R-1A, the typical snow melting rate of 30 cu yd / hr is used to calculate snow processing and liquids recovery. Liquids from melted snow are stored in twenty-four (24) 400-bbl tanks staged within containment at the Inigok Staging Area.

8. For Days 16 to cleanup completion, TF-5 recovery rate is based on a maximum distance of 150 miles from Inigok Staging Area to DS-4 Grind and Inject Facility. The recovery rate for 300-bbl vacuum trucks includes round-trip travel of 8.6 hours on armored snow/ice roads plus 4 hours for loading and unloading. Recovery Rate = Vacuum Unit Capacity / [(Distance to Unload X 2 / Speed mph) + (2 X Vacuum Unit Capacity / Winter Pumping Rate)] or 300 bbl / [(150 mi X 2 / 30 mph) + (2 X 300 bbl / 150 bbl/hour)] = 21.4 bbl/hour.

9. Mobilization is based upon time to mobilize response personnel to the site via air and over snow roads; recovery would not begin until safe working zone is established on Day 3. Armoring of packed, snow roads between DS-2P and Inigok Staging Area to the well site is initiated on Day 2 and completed by Day 8 enabling mobilization of snow melters, conventional 30-cu yd end dumps and 300-bbl vacuum trucks to sustain recovery.

Table 1.6-8
Scenario 1 Personnel and Equipment for Operation of Oil Recovery and Transfer Equipment – West Inigok Area Exploration Well Blowout during Winter with Snow/Ice Road Access

					Days 1 to 7		Days 8 to 15		Days 16 to 21	
Task Force	**Tactic**	**Equipment**	**Total Number of Pieces Needed**	**Personnel per Equipment**	**A Shift**	**B Shift**	**A Shift**	**B Shift**	**A Shift**	**B Shift**
Berm Building	C-1	Loader with bucket	1	1	1	1	1	1	1	1
		Steiger with blade or equivalent	2	1	2	2	2	2	2	2
				Subtotal	**3**	**3**	**3**	**3**	**3**	**3**
Thickening and Armoring Snow/Ice Roads	L-1	Water tanker	20	1	20	20	6	6	6	6
		Loader with drag	20	1	20	20	6	6	6	6
		Grader	12	1	12	12	6	6	6	6
				Subtotal	**52**	**52**	**18**	**18**	**18**	**18**
TF-1 (Areas WSW-1 and SW-1)	R-6 and R-22	Steiger with 240-bbl tank	14	1	14	14	0	0	0	0
		Vacuum truck, 90-bbl	20	1	0	0	20	20	0	0
		Vacuum truck, 300-bbl	6 / 14	1	6	6	0	0	14	14
		3-inch pump	6 / 10	3	18	18	30	30	18	18
		Hose setup[1]	4,800 / 8,000 ft	0	0	0	0	0	0	0
		Portable tank[1]	6 / 10	0	0	0	0	0	0	0
		Snowmachines	2	1	2	2	2	2	2	2
				Subtotal	**40**	**40**	**52**	**52**	**34**	**34**

Table 1.6-8
Scenario 1 Personnel and Equipment for Operation of Oil Recovery and Transfer Equipment – West Inigok Area Exploration Well Blowout during Winter with Snow/Ice Road Access

					Days 1 to 7		Days 8 to 15		Days 16 to 21	
Task Force	**Tactic**	**Equipment**	**Total Number of Pieces Needed**	**Personnel per Equipment**	**A Shift**	**B Shift**	**A Shift**	**B Shift**	**A Shift**	**B Shift**
TF-2 (Areas WSW-1, WSW-2, WSW-3, SW-1, SW-2 and SW-3)	R-1, R-2, R-3	Loader with bucket	2 / 4	1	0	0	2	2	4	4
		Dump truck	4 / 12	1	0	0	4	4	12	12
		Spotter	2	1	0	0	2	2	2	2
				Subtotal	**0**	**0**	**8**	**8**	**18**	**18**
TF-3 (Areas WSW-2, WSW-3, SW-2 and SW-3)	R-1, R-1A, R-2	Shovel/broom	12	1	0	0	12	12	12	12
		Snowmachine	2	1	0	0	2	2	2	2
		Snow blower	2	1	0	0	2	2	2	2
		Dump truck[2]	2	1	0	0	0	0	0	0
				Subtotal	**0**	**0**	**16**	**16**	**16**	**16**
TF-4 (Areas WSW-1 and SW-1)	R-5	Loader with trimmer	1	1	0	0	0	0	1	1
		Loader with bucket	1	1	0	0	0	0	1	1
		Dump truck[2]	2	1	0	0	0	0	0	0
		Spotter	1	1	0	0	0	0	1	1
				Subtotal	**0**	**0**	**0**	**0**	**3**	**3**
TF-5 (Inigok Staging Area)	R-1, R-1A, R-2, R-3, R-22	Snow melter	4	2	0	0	8	8	8	8
		Loader with bucket	4	1			4	4	4	4
		Vacuum truck, 300-bbl	4	1	0	0	4	4	4	4
		Spotter	1	1	0	0	4	4	4	4
				Subtotal	**0**	**0**	**20**	**20**	**20**	**20**

Table 1.6-8
Scenario 1 Personnel and Equipment for Operation of Oil Recovery and Transfer Equipment – West Inigok Area Exploration Well Blowout during Winter with Snow/Ice Road Access

					Days 1 to 7		Days 8 to 15		Days 16 to 21	
TF-1, TF-2, TF-3, TF-4 & TF-5 (Support Equipment)	L-1,C-1, R-1, R-1A, R-2, R-5, R-6, R-22	Fuel Truck	6	1	6	6	6	6	6	6
		Mechanic Truck	3	1	3	3	3	3	3	3
		Lube Truck	2	1	2	2	2	2	2	2
		Light Plants	≥10	1 (total)	1	1	1	1	1	1
Subtotal					**12**	**12**	**12**	**12**	**12**	**12**
Subtotal ACS and Auxiliary Response Personnel					**20**	**20**	**62**	**62**	**51**	**51**
Subtotal Equipment Operators					**87**	**87**	**69**	**69**	**67**	**67**
Grand Total					**107**	**107**	**131**	**131**	**118**	**118**

1. For Days 3 to 7, TF-1 consists of six (6) crews of three (3) workers who set up and operate six (6) 3-inch positive displacement pumps, suction and discharge hoses, and six (6) portable tanks to assist vacuum units in reaching recovery locations greater than 200 ft. For Days 8 to 15, TF-1 consists of ten (10) crews of three (3) workers who set up and operate ten (10) 3-inch positive displacement pumps, suction and discharge hoses, and six (6) portable tanks to assist vacuum units in reaching recovery locations greater than 200 ft. For Days 16 to cleanup completion, TF-1 consists of six (6) crews of three (3) workers who set up and operate six (6) 3-inch positive displacement pumps, suction and discharge hoses, and six (6) portable tanks to assist vacuum units in reaching recovery locations greater than 200 ft. The personnel for the hoses, portable tanks, and snowmachines are not included in the totals, because they are collectively counted in the personnel for the pumps. The snowmachines are only used temporarily during pump set up to haul pumps, hoses, and portable tanks.
2. The operators for dump trucks are not counted because they are shared with TF-2 and TF-3.

RESPONSE STRATEGY 1
RIG FUEL TANK SPILL DURING WINTER WITH SNOW/ICE ROAD ACCESS

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Table 1.6-9
Response Strategy 1 Conditions – Rig Fuel Tank Spill during Winter with Snow/Ice Road Access

Parameter	Initial Conditions	Cross References
Spill Location	North Slope Onshore Exploration Well	Not Applicable N/A
Time and Date	6:00 am, Winter	N/A
Duration	Instantaneous	N/A
Type of Spill	Flange leak of the rig fuel tank	N/A
Quantity of Oil Spilled	Initial RPS Volume = 10,000 gal Adjusted RPS Volume = 4,000 gal (10,000 gal less 60% adjustment credit for secondary containment)	Refer to Section 2.6 and Section 5.
Emulsification Factor (Applicable to oil that reaches open water; for storage purposes only)	N/A	N/A
Liquid Type	Arctic Diesel Fuel	N/A
Wind Speed	20 Knots	N/A
Wind Direction	Day 1 – 2: wind from the West-Southwest	N/A
Current	N/A	N/A
Air Temperature	-20°F; Visibility: greater than 5 miles	N/A
Surface	Well location is an ice pad.	N/A
Trajectory	The spill spreads out from the fuel tank and temporarily is contained on the frozen drill pad by the secondary containment surrounding the fuel tank. The secondary containment partially fails spilling 4,000 gal of fuel out onto the drill pad. The spill is completely contained on the frozen drill pad by snow berms constructed by response teams.	N/A

gal = gallon(s)
N/A = not applicable
RPS = response planning standard

Table 1.6-10
Response Strategy 1 Response Strategy – Rig Fuel Tank Spill during Winter with Snow/Ice Road Access (Medium Spill)

ADEC Requirement	Response Strategy	ACS Tactic
(i) Stopping Discharge at Source	North Slope Energy Company Man is notified of the spill and in turn notifies the Safety Officer and ACS Technician. The ACS Technician mobilizes to assist the Safety Officer with a safety assessment and secure the site. The water pump truck and fire suppression equipment are staged next to the site. After all ignition sources are removed and proper PPE is established, on-site responders clamp the flange and prevent further leakage. The secondary containment is also repaired. All notifications to appropriate personnel and agencies are made (see Section "Emergency Action Checklists").	Refer to Sections 1.1 & 1.2 S-1 through S-6
(ii) Preventing or Controlling Fire Hazards	All running engines in the vicinity are immediately shut down to eliminate ignition sources. The North Slope Energy Company Man verifies that all sources of ignition are shut off and locked out or removed from area. An exclusion zone is erected. All personnel are briefed about this exclusion zone. The Safety Officer and ACS Technician establish PPE requirements for entering the exclusion zones. All zones and contaminated areas surrounding the spill are designated as control zones and security procedures are established. Non-essential personnel are placed as control "guards". The Safety Officer and ACS Technician set up a monitoring protocol to ensure personnel protection. Winds are monitored and LELs are measured. A general no smoking policy is enforced throughout the exclusion zones.	S-1 through S-6
(iv) Surveillance and Tracking of Oil	The extent of the diesel is marked on the snow and ice, so that it can be found if subsequent snowfall or drifting snow covers the spill. The fuel saturates the top 6 inches of the 1 ft snow/ice depth in an area approximately 50 ft x 50 ft. Machinery and hand digging removes the top 6 inches of snow and ice yielding approximately 50 cu yd of contaminated material and snow.	T-1
(v) Exclusion Procedures	All fuel is contained on the ice pad. Snow berms are constructed around the site. No additional exclusion procedures required.	C-1
(vi) Spill Containment and Control Actions	Using the drill pad's front-end loader, a snow berm is built around the perimeter of the spilled diesel. The berms are monitored and shored up as necessary so that the spill is contained on the pad.	C-1
(vii) Spill Recovery Procedures	Approximately 50 cu yd of snow and diesel-contaminated snow is removed by front-end loader and transferred to lined and covered 30-cu yd Cat 245 end dumps on tundra tires (mobilized from Deadhorse) for transport. Two (2) end dumps arrive on Day 2 of the spill. Once recovery of oiled snow is complete, diesel embedded in surface of the ice is removed by Bobcat-mounted trimmer and transferred to dump trucks for transport. (The truck carrying the trimmer arrives on Day 2 of the spill.)	R-1, R-2, R-3 R-5
(viii) Lightering Procedures	The damaged tank is lightered to a portable 400-bbl tank mobilized from Deadhorse.	R-27

Table 1.6-10
Response Strategy 1 Response Strategy – Rig Fuel Tank Spill during Winter with Snow/Ice Road Access (Medium Spill)

ADEC Requirement	Response Strategy	ACS Tactic
(ix) Transfer and Storage of Recovered Oil/Water; Volume Estimating Procedure	All recovered material is in the form of contaminated snow and ice. Contaminated snow is stored in lined interim storage constructed at DS-2P Staging Area within the existing infrastructure. Liners are constructed of 8228 ORLTA polyester fabric with finished coat weight 18 oz/sq yd and -67°F cold crack. Liner is available from numerous North Slope locations. A stock of Seaman 8228 ORLTA and XR-5 8130 Reinforced Geomembrane is maintained at Polar Supply in Anchorage, and additional supplies can be mobilized as necessary. Stored oil and oily water (inclusive of meltwater from snow) shall be gauged and recorded for volume estimation prior to treatment or final disposal. The method of transfer, temporary storage, and final disposal of recovered product shall be reviewed and approved by ADEC as a component of the incident-specific Waste management Plan.	D-1 T-7
(x) Plans, Procedures and Locations for Temporary Storage and Disposal	Contaminated snow and ice are hauled to the nearest central processing facility for melting and processing. Non-liquid oily wastes are classified and disposed of according to classification. Non-oily wastes are classified and disposed of accordingly. The method of transfer, temporary storage, and final disposal of recovered product shall be reviewed and approved by ADEC as a component of the incident-specific Waste Management Plan.	D-1 D-2 D-3
(xi) Wildlife Protection Plan	The spill is contained on the pad area. No risk to wildlife is anticipated.	N/A
(xii) Shoreline Cleanup Plan	Not Applicable	N/A

ADEC = Alaska Department of Environmental Conservation
North Slope Energy = North Slope Energy, LLC
ACS = Alaska Clean Seas
bbl = barrel(s)
cu yd = cubic yard(s)
ft = feet/foot
LEL = lower explosive limit
N/A = not applicable
ORTLA = Oil Resistant Low Temperature Liner Material
oz = ounce(s)
PPE = personal protective equipment
sq yd = square yard(s)

Table 1.6-11
Response Strategy 1 – Recovery and Handling Capabilities – Rig Fuel Tank Spill during Winter with Snow/Ice Road Access (Medium Spill)

A	B	C	D	E	F	G
Spill Recovery Tactic	**Number of Systems**	**Recovery System[1,2]**	**Oily Material Recovery Rate[3] (cu yd per hour)**	**Mobilization and Transit Time to Site (hours)**	**Operating Time (hours per day)**	**Handling Capacity (cu yd per day) B x D x F**
R-1, R-2, R-3	2	Front-end loader with snow bucket to 30-cu yd Cat 245 end dump	2.7	24[2]	20	108
R-5	2	Loader-mounted trimmer to front-end loader to 30-cu yd Cat 245 end dump	2.7	24[2]	20	108

1. End dumps and trimmer are activated on Day 1, but do not arrive until Day 2.
2. Two (2) end dumps are shared between the loader with snow bucket and loader with trimmer.
3. Recovery rate includes load time, transit time to DS-2P storage/processing areas, offloading time, and return trip to site. For this spill, the end dumps have adequate capacity to haul the recovered snow and do not return to the site.

cu yd = cubic yard(s)

1.7 NON-MECHANICAL RESPONSE OPTIONS

Cross-reference:

18 AAC 75.425(e)(1)(G)

Alaska Inland Area Contingency Plan

Arctic and Western Alaska Area Contingency Plan

In Situ Burning Guidelines for Alaska, Revision 1

Tundra Treatment Guidelines – A Manual for Treating Oil and Hazardous Substance Spills to Tundra

1.7.1 Non-Mechanical Response Option

North Slope Energy will mechanically contain and clean up oil spills to the maximum extent possible. In the event a spill reaches tundra or wetlands, North Slope Energy may request approval for in situ burning (ISB) from the FOSC, SOSC, and Alaska Regional Response Team (ARRT) when ISB will be used as a tool to burn contaminated vegetation and minimize environmental damage. Burn operations would be implemented using the Tundra Treatment Guidelines, Tactic CR-10. It is anticipated that burn operations would be limited in scope and conducted during moist conditions using rakes, shovels, weed burners, and fire extinguishers or water pumps. The use of dispersants will not be used as a non-mechanical response because this is a land-based winter operation.

1.7.2 Obtaining Permits and Approvals

ISB will not occur without approval of state and federal agencies. The IC will discuss the option of ISB with the FOSCs and SOSCs. North Slope Energy and ACS will complete an "Application and Burn Plan" form in accordance with In-Situ Burning Guidelines for Alaska. The "Application and Burn Plan" would be submitted to the FOSC and SOSC in the UC for authorization.

1.7.3 Decision Criteria

ISB of spilled oil will be considered under conditions such as the following:

- Mechanical recovery is impractical or ineffective for treatment of oiled vegetation
- Burning would augment the oil elimination capacity of mechanical recovery
- Present and forecast wind conditions will carry the smoke plume away from populated areas
- A successful test burn has been conducted
- Oil thickness greater than 0.1 inch
- Winds less than 20 knots
- Oil-water/ice emulsions contain 50 percent or more oil (if applicable).

1.7.4 Implementation Procedures

If the North Slope Energy IC decides to use ISB and obtains the necessary authorization, ACS will carry out the response.

1.7.5 Required Equipment and Personnel

In the event ISB is authorized, the on-site ACS Spill Technicians are trained to safely deploy and operate ignition equipment.

1.8 FACILITY DIAGRAMS

Cross-reference:
18 AAC 75.425(e)(1)(H)

1.8.1 Facility Diagrams

Location of the project area is depicted in Figure 1.8-1. Figure 1.8-2 depicts a typical drill pad layout and ice pad configuration. Additional facility diagrams and information are provided in each project and site-specific addenda.

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Figure 1.8-1 Project Area Location

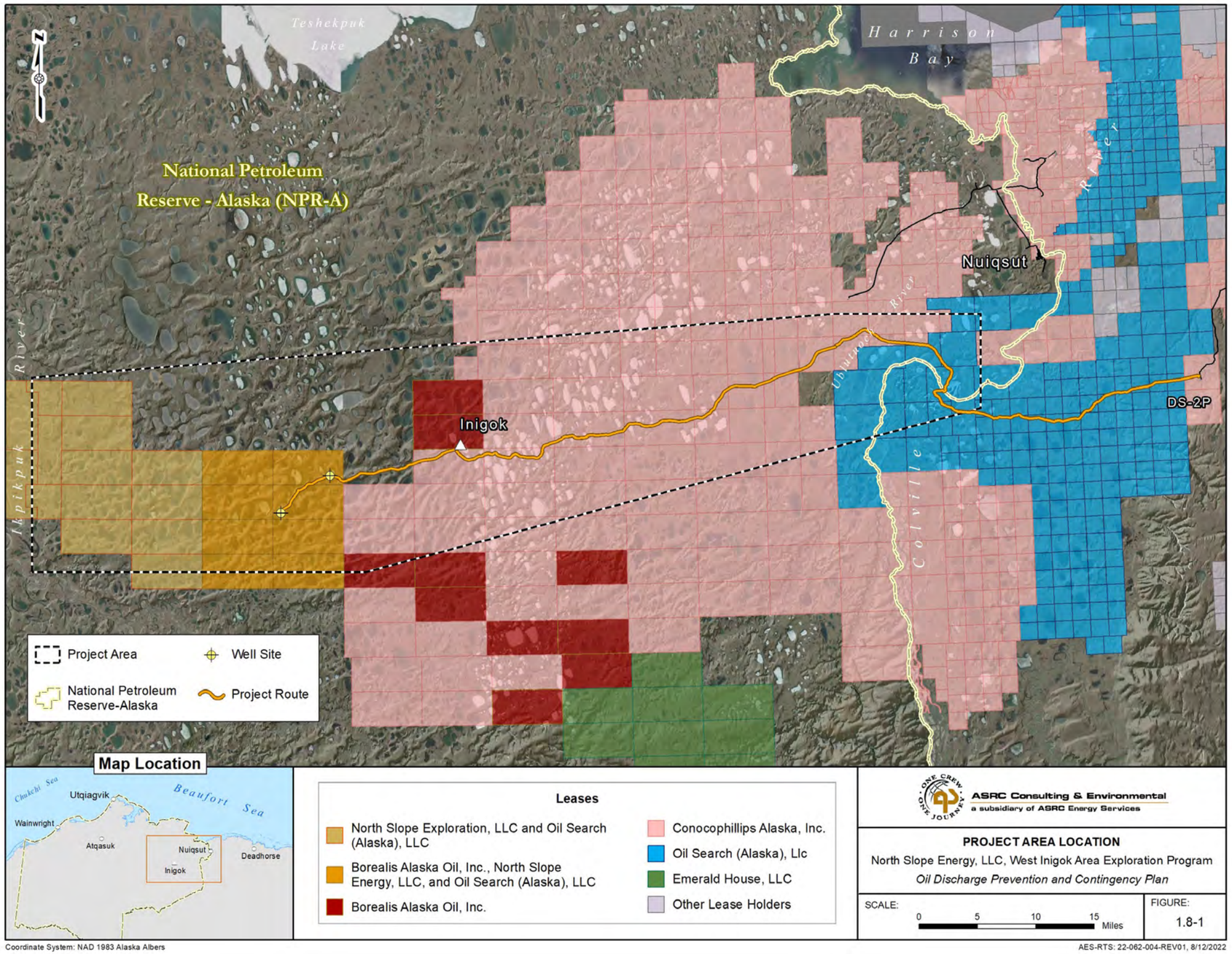

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Figure 1.8-2 UCW-1 Typical Drill Pad Layout

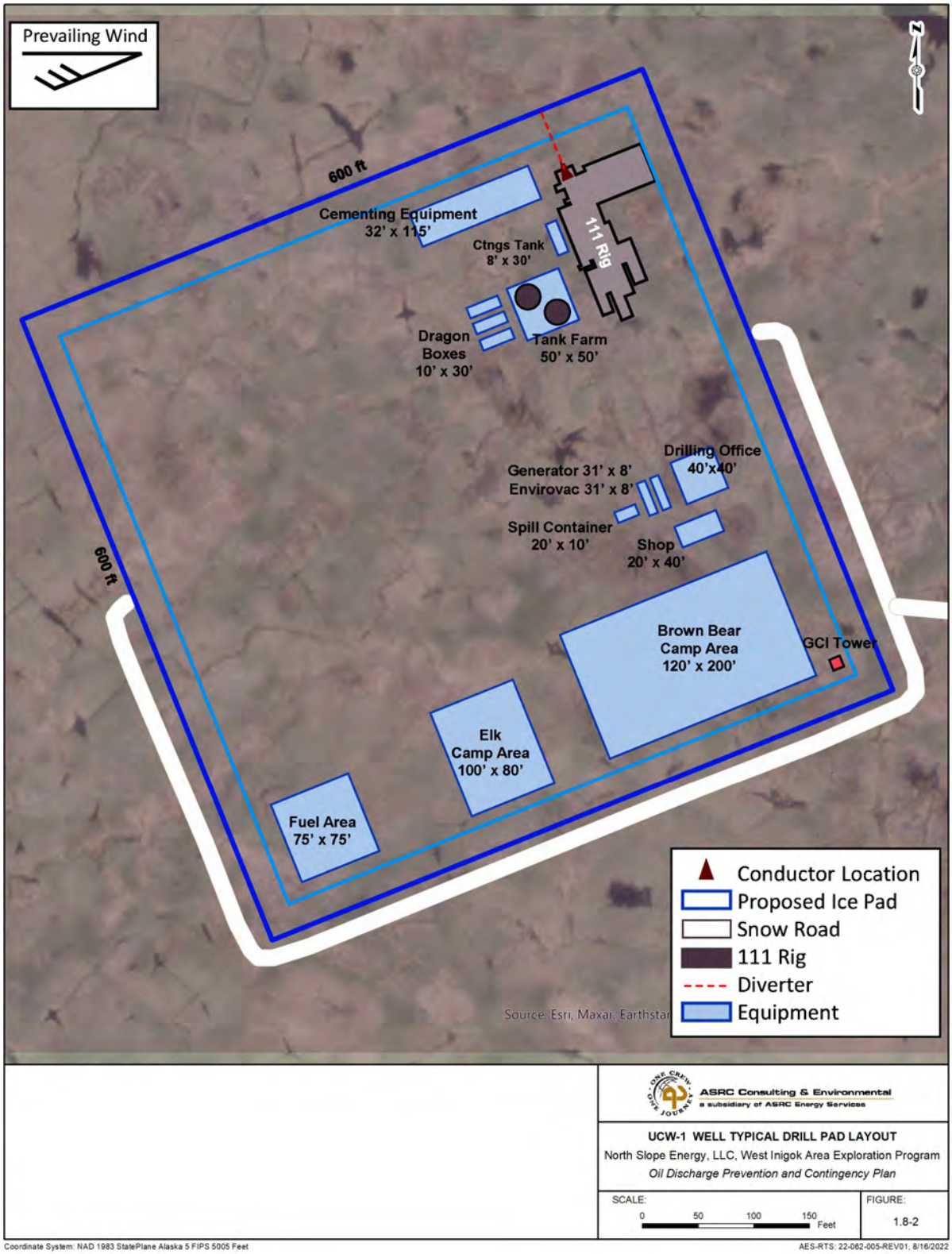
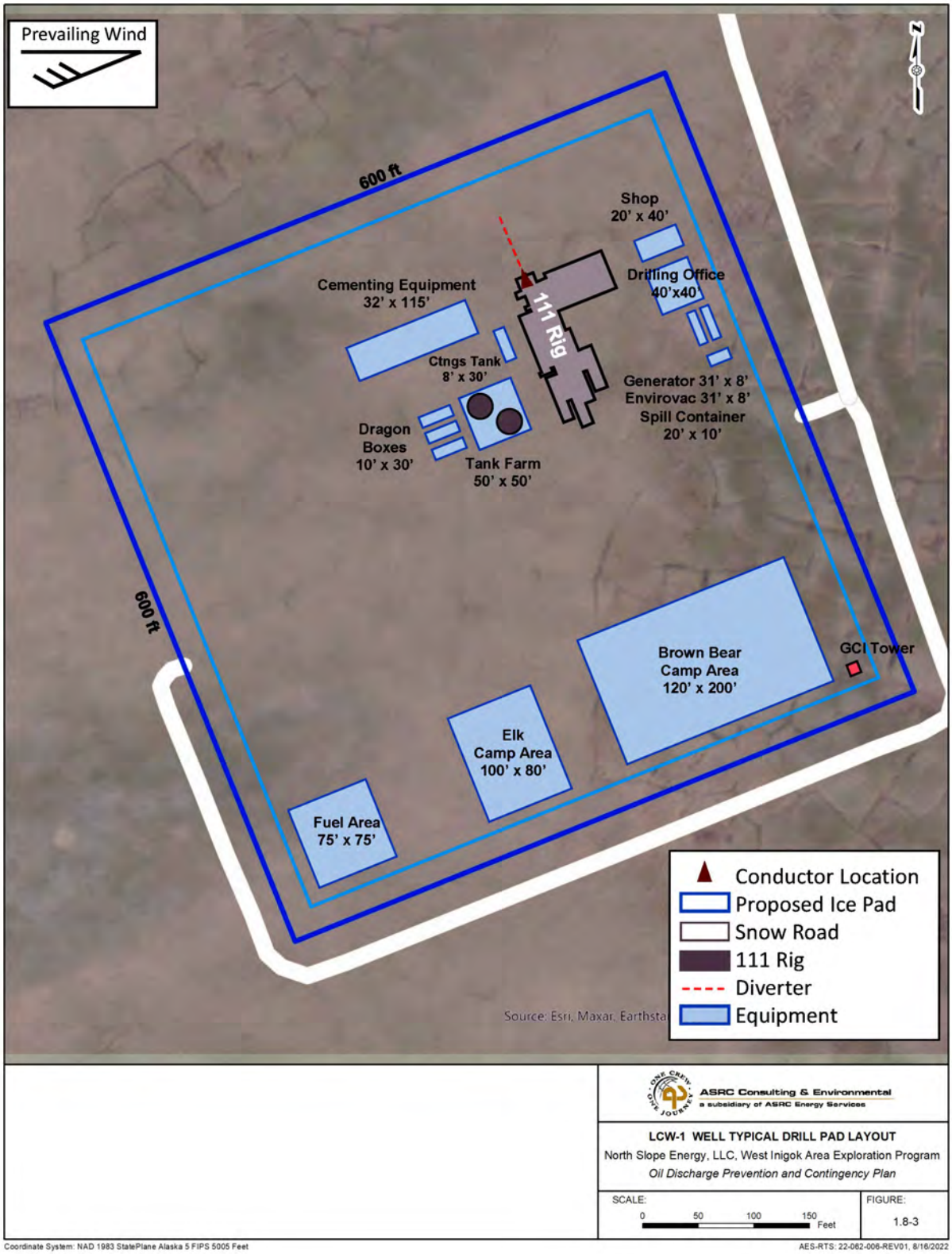


Figure 1.8-3 LCW-1 Typical Drill Pad Layout



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Attachments

Tables

Forms

2.0 PREVENTION PLAN

2.1 PREVENTION PROGRAMS

Cross-reference:

18 AAC 75.425(e)(2)(A)

20 AAC 25

Alaska Safety Handbook

North Slope Environmental Field Handbook

North Slope Energy considers spill prevention a critical part of company operations. Regular maintenance, inspections, and accurate record keeping by trained personnel are an integral part of this program. North Slope Energy will take the necessary steps to minimize the number of spills and their impact, while ensuring that ADEC is notified of all reportable spills.

2.1.1 Prevention Training Programs

Spill prevention training for North Slope Energy's contract employees includes familiarization of employees with the State of Alaska's pollution prevention regulations and this ODPCP. General procedures for prevention of injury, property loss/damage, spill incidents, and environmental damage are contained in the ASH, the North Slope Environmental Field Handbook, and North Slope Energy's Best Management Practice and Procedures (BMPs) (Attachment 2.1-A), which are maintained on site and available to all employees. North Slope Energy's program provides the training summarized in Table 2.1-1 for employees and contractors directly engaged in the inspection, maintenance, and operation of oil storage tanks and fuel transfers associated with drilling operations. North Slope Energy maintains records of employee and contractor training in support of the programs listed in Table 2.1-1 for a minimum of five years.

The North Slope Training Cooperative (NSTC) program is a one-day training seminar that is mandatory for personnel to have unescorted access through oil production facilities on the North Slope. The NSTC program consists of a series of training videos and lectures covering the following topics:

- ASH
- Camps and Facilities Safety Orientation
- Environmental Excellence
- Hazard Communication (HAZCOM)
- Hazardous Waste Operations and Emergency Response (HAZWOPER) Awareness;
- PPE
- H_2S.

The NSTC program includes review of the North Slope Environmental Field Handbook, which is available to everyone on the North Slope. The handbook provides a general overview of state and federal environmental regulations and programs applicable to the North Slope. The handbook covers programs specific to air, land, water, spills, and waste management.

Table 2.1-1
Spill Prevention Matrix

Prevention Program	Personnel	Qualification	Training Objective	Frequency
Routine visual facility inspections	North Slope Energy/ contractor[1]	Health, Environment and Safety (HES) Training	Facility integrity, maintenance, spill detection, surface liner use, site safety	I/O
Monthly visual pipe inspection	North Slope Energy/ contractor[1]	HES Training	Pipe and support integrity, valve and connection integrity, protection from damage	I/O
Routine tank inspection (once per week minimum)	North Slope Energy/ contractor[1]	HES Training	Tank and valve integrity, proper labeling, secondary containment integrity and effectiveness (including drain valve operation and water or debris management)	I/O
Fuel transfer procedures	North Slope Energy/ contractor[1,2]	HES Training	Proper transfer procedures, safety procedures	I/O
ODPCP training	North Slope Energy/ contractor[1]	HES Training	Spill reporting and notification	I/A
American Petroleum Institute (API) 653/Steel Tank Institute (STI) SP 001 inspection	Contractor Qualified Tank Inspector	API 653/ STI SP 001 Certification	Tank integrity	I/R
NSTC	North Slope Energy/ contractor[3]	NSTC	Spill prevention and safe operations	I/A

Notes:
[1] = Personnel include the Drill Site Manager, Spill Technician, Field Environmental Coordinator, and Camp Manager.
[2] = Personnel who conduct fuel transfer include the Spill Technician, Field Environmental Coordinator, person-in-charge, and fuel tanker operator.
[3] = All North Slope Energy and contractor field personnel
A = Annual refresher
I = Initial hire or initial certification
NSTC = North Slope Training Cooperative
O = Annual demonstration of competence
ODPCP = core plan
R = API re-certification every three or six years depending upon employment history

Drilling-Related Training

The primary prevention training program for drilling personnel is a comprehensive, 32-hour minimum, well-control course following AOGCC guidelines which are required for all drillers and toolpushers. This four-day basic course is required once every two years.

The AOGCC-approved well-control program includes classroom and simulator instruction on all types of BOP equipment, causes of kicks and blowouts, kick killing procedures, warning signs of kicks, kick detection, shut-in procedures, and above all, personnel safety and health. In addition, the following training may be provided to select drilling personnel:

- HAZWOPER Level 1 (annual refresher course)
- Fall Protection (annual refresher course)
- Confined Space Entry
- Lockout/Tagout of Hazardous Energy Sources

2.1.2 Training Requirements

During drilling operations there typically will be at least four personnel (one Spill Technician and three rig hands or support contractors) on site at any given time that are trained and qualified to provide an immediate response in the event of a spill. The Spill Technician would fulfill the role of Team Leader and will provide environmental support, spill plan orientation, and additional spill response training to on-site personnel.

In addition to all training described in this section, all responders shall be trained in the requirements of this manual.

The Spill Technician will possess the following additional minimum training qualifications or knowledge:

- 40-hour HAZWOPER (eight-hour refresher course/year)
- Spill Technician Training/Experience
- Environmental Handbook/Spill Prevention Guidelines (North Slope Environmental Field Handbook, Current Year) (refresher course – when new guidelines are printed – approximately every two years)
- Manifesting Training ("Red Book") (refresher course – when new Red Book is printed – approximately every two years)
- Drill Rig Orientation (refresher course – each drilling season.)
- North Slope Energy ODPCP (refresher course – each drilling season)

The Spill Technician shall be fully aware of waste issues involving on-site generation, storage, segregation, manifesting, and transportation. They must be knowledgeable of exempt vs. non-exempt and hazardous vs. non-hazardous materials and the associated practices in managing the material in accordance with standard operating procedures.

All field personnel associated with fuel delivery, transfer, and handling will receive training in North Slope Energy procedures which will include BMPs related to fuel transfer and handling, drum labeling, secondary containment guidelines, and the use of liners/drip trays. Attachment 2.1-A presents BMPs for fluid transfer procedures of North Slope operations. Spill Technicians will be trained in the use of Forms 2.1-1 through 2.1-3 for conducting inspections and monitoring fuel transfers, drum labeling, secondary containment guidelines, and the use of liners/drip trays.

North Slope Energy and contractors maintain records of training received by each employee who are engaged in job duties involving inspection, maintenance or operation of oil storage and transfer equipment at the drill site. For each training participant, a record would be maintained which includes a signed verification of training received, brief description of the training course, and the date completed. Contractors would also maintain their own training records.

Training includes:

- Site inspection procedures
- Spill prevention BMPs
- Transfer procedures
- Equipment operation to prevent spills
- Equipment maintenance to prevent spills
- Accountability for spill prevention.

2.1.3 Substance Abuse Programs

General Policies

The use, possession, distribution, or sale of unauthorized drugs, alcohol, or other controlled substances by company employees and subcontractors while on company premises or while engaged in company business is prohibited. Employees and subcontractors reporting for work with unauthorized drugs in their system or under the influence of alcohol are in violation of this policy.

Alcohol and illegal drugs are prohibited at all North Slope Energy drilling operations. If any personnel are found to be in possession or under the influence of alcohol or illegal drugs while on the job, immediate dismissal from assigned duties is required. Subcontractors are required to adhere to North Slope Energy's policy on alcohol and illegal drugs while on company premises or engaged in company business.

Controlled Substances

Employees, subcontractors, and other third-parties are prohibited from using, possessing, distributing, purchasing, or selling any controlled substance while on company premises, engaged in company business, or while operating company equipment. Any use of a controlled substance that causes or contributes to unacceptable job performance or unusual job behavior is also prohibited.

Alcohol

The use or possession of alcoholic beverages while on company property, or in any company vehicle, or on company time (including breaks or lunch, paid or unpaid) on any shift during exploration projects is strictly prohibited.

Definitions and Guidelines

As used herein, "controlled substance" specifically includes opiates, including heroin; hallucinogens, including marijuana, mescaline, and peyote; cocaine; Phencyclidine; and prescription drugs, including amphetamines, benzodiazepines, and barbiturates, which are not obtained and used under a prescription lawfully issued to the person possessing them or which are not authorized by the company medical staff; and any other substance included in the Federal Controlled Substances Act or its regulations or unlawful under applicable law.

Prescription Drugs and Other Medications – If an employee or subcontractor is taking a legal drug that may affect performance or operational safety, the supervisor, in consultation with local management, will determine whether the employee can safely perform the duties of the job.

Company Premises – Company premises is used in the broadest sense and includes, but is not limited to, all land, property, buildings, structures, installations, vehicles, equipment, aircraft, and watercraft owned, leased, or in any other manner used by company for any purpose.

Personal Search – North Slope Energy maintains the right to conduct unannounced searches for controlled substances. This includes:

- Company lockers, desks, toolboxes, vehicles, packages and other property
- Employees or their personal property at any time while on company premises, including company equipment and vehicles.

2.1.4 Medical Programs

North Slope Energy requires all site personnel including contractors to be physically capable of performing the job they were hired to perform. On-site North Slope Energy personnel and subcontractors are required to participate in a pre-job medical screening to assess their ability to safely perform their job function. In the event an employee or contractor has a medical condition that could adversely affect their job performance, an evaluation by a physician or medical specialist would be required to verify the individual's ability to safely perform their job.

On-call Emergency Medical Technician (EMT) services are located in Prudhoe Bay at the Main Construction Camp (MCC) Medical Clinic. Medical emergency patients can be transported from Inigok Airstrip to Deadhorse by aircraft. EMTs are first-aid and CPR-certified. The EMT serves a number of functions, including:

- Treatment of minor injuries
- Distribution of safety equipment
- Identification of potential health hazards
- Identification of personnel who may pose a health hazard to company operations or other employees
- Monitoring the camp facility for health issues

Paramedics are also available in Anchorage and Fairbanks for treatment of more serious injuries and to aid with transport to a hospital.

2.1.5 Security Program

The drilling locations are sited within restricted access areas, primarily by means of ice snow/roads or aircraft. Drill sites will be staffed 24 hours per day, and on-site personnel will control access. Lighting would be provided at strategic areas around the drilling site.

For proprietary and safety reasons, access to the drill rig and facilities will be restricted to authorized and regulatory personnel. Authorized and regulatory personnel carrying photographic identification may access the drill site at any time. Regulatory personnel must contact the on-site drill site manager and comply with all applicable safety regulations and policies in order to access the drill rig.

2.1.6 Well Control and Emergency Shutdown

Drilling Assurance

This section outlines preventative and recovery measures to minimize hydrocarbon spill potential, which are applied to onshore drilling and well operations. All well control discussions presented in this section are aimed at preventing spills during drilling operations. The various methods used to regain well control are summarized in Section 1.6.1. The potential for spill incidents is presented in Section 2.3.

Well Control during Planning

The process of well control commences before actual drilling operations with the planning and design of any well. Seismic data and offset well information provide information for the prediction of over-pressured formations. Drilling engineers use the predictions for formation pressure to design a drilling mud program with sufficient hydrostatic head to overbalance the formation pressures from surface-to-well total depth. Other factors influencing the mud weight are shale conditions, fractures, lost circulation zones, under-pressured formations, and stuck pipe prevention. Casing strings are then designed to prevent several of these factors affecting the well control performance at the same time. Casing set at proper depths will allow a kick, if taken, to be safely controlled downhole.

Well Control during Drilling

There are two areas where the potential for loss of well control exists during drilling. The first is during the drilling of the surface hole where the potential for a shallow gas blowout exists. It should be noted that shallow gas blowouts do not contain oil and no spill of oil occurs at the surface. However, the incident is critical from a safety and health standpoint. The second is during drilling the below-surface wellbore, where a blowout can occur while drilling into the reservoir or other hydrocarbon-bearing zones or during completion of the well. In both cases, kick identification and management are the primary tools used to prevent a blowout. All drilling and well operations will take place according to state regulations (20 AAC 25), and all well plans will be approved by the AOGCC prior to the work being performed. (See Forms 2.1-1 through 2.1-3 for inspection procedures and checklists during drilling operations.)

Form 2.1-1
Inspection Procedures for Fuel and Water Storage and Transfer System of Mobile Drilling Rigs

1. _____ Inspect all engine-fuel day tanks and associated fuel lines and valves for freedom of fuel flow and for leaks.
2. _____ Check fuel-supply lines from bulk storage tanks for leakage. Verify that supply lines laid for miscellaneous use, such as construction and truck equipment fill-up, camp tank, hot-air heaters, and boilers, are intact and all control valves are functional and in the correct operating position. Verify that no ice blockage exists from accumulated water.
3. _____ Inspect all bulk-storage fuel tanks. Verify that all vents are open and all bottom valves are functional and in the correct operating position. Gauge each tank and report fuel volumes, as directed. Bottom valves will be left closed at all times fuel is not being transferred.
4. _____ Coordinate with all other personnel the transfer of all fuel to, from, or on the rig site. Report each such occurrence to the driller. Verify that all transfer valves are left in the closed position and that all transfer hoses and lines remain intact after each transfer.
5. _____ Inspect water storage tank(s). Verify that valves and lines are intact and that overflow or top vent is open. Report supply availability of water, as directed.
6. _____ Check each water-supply line along entire length for leaks and control valve operating position, and verify that lines are open (not frozen).
7. _____ Motorman should report results of inspection to driller. Driller will give instructions, as required, to the rig crew for correcting noted discrepancies. Driller will also report all abnormal conditions to the rig supervisor immediately.
8. _____ The completion of this inspection procedure is to be recorded on the International Association of Drilling Contractors report each shift or day.

Form 2.1-2
Inspection Procedures for Drilling Fluid System

_____ 1. Check drilling nipple, flowline, and shale shaker box for leaks and flow stoppages. Shale shaker screen, back side of shale shaker, including bypass and overflow, should be checked for proper functioning and fluid flow.

_____ 2. Inspect blowout preventer (BOP) equipment, including kill-line and choke manifolds, with associated relief lines, for fluid flow and presence of frozen liquids. Position of each valve in the system should be determined in accordance with BOP operating procedures.

_____ 3. Inspect outside of mud tanks, including bottoms, for fluid flow. Verify that there is no fluid flow below drifted cuttings, snow, or ice. All discharge jets and cleaning hatches between tank flowlines should be free of leaks.

_____ 4. Check mud pumps; pump-suction lines; pressure-safety, valve-relief lines; and high-pressure, mud lines in substructure to the rig floor, cement units, and mud hoppers, for leaks and/or freeze-up.

_____ 5. Check equipment on top of each mud tank for proper operation. Mud bypass troughs and lines should be clear to prevent overflow. Degasser inlet and discharge lines and associated control valves should be open for flow and unfrozen. De-silter and de-sander inlet, discharge, and underflow lines should be unblocked, with control valves free. Check for excessive underflow. Check mud hopper(s) for proper operation(s).

_____ 6. Inspect all hydraulic accumulators, actuators, lines, and valves for freedom of flow and leaks.

Well Control during Surface Hole Drilling

During surface-hole drilling, a shallow gas blowout can occur when a small, high-pressure volume of trapped gas is encountered. This causes a rapid unloading of the wellbore fluids (mud) and gas at surface in a very short time span.

Detection during drilling or tripping (i.e., running the drill string into or out of the hole) will be visible by monitoring the returns to the surface from the drilling fluid system, monitoring the volume of drilling fluid required to fill the wellbore, and monitoring the drilling fluid weight in and out of the well to detect any influx of gas into the wellbore.

The well at this stage of construction cannot be shut in if it flows. Instead, the flow of gas is directed away from the rig floor using a diverter valve and diverter line, which vents the gas at a safe distance from the drill rig to atmosphere. Procedures are developed to continue pumping fluid to the drill string wherever possible to try and establish primary well control, though most shallow blowouts deplete rapidly and/or bridge off.

Well Control While Drilling Below the Surface Hole

A management-approved detailed well plan is taken to the rig and the well is drilled. During drilling, the mud weight (the primary well-control mechanism) is constantly monitored and adjusted to meet actual wellbore requirements. Too low a mud weight could underbalance the well and result in a kick being taken (e.g., a flow of formation liquids, oil, gas, or water into the wellbore). Too high a mud weight might result in lost circulation to a weak formation, which can then lead to an underbalanced condition and possible kick. Generally, there is a fairly broad range of mud weight that will provide the proper well control for the downhole conditions encountered.

The weight of the mud in the hole is the primary well-control mechanism. If a kick does occur, secondary well control methods are employed. Constant monitoring of the fluid level in the wellbore and mud pits allows prompt notice of a kick in the hole. If a kick is noticed, the well is shut in using BOP equipment installed on the wellhead after the surface casing is set (below the permafrost). The BOP equipment will close off and contain influx and pressures in the annulus and in the drill pipe. Pressure measurements are then taken and the mud in the surface pits is weighted enough to overbalance the bottomhole formation pressure. A standard well-kick procedure is then implemented to circulate the heavy mud through the well and safely remove the influx from the hole. After this procedure is completed, the well is opened up and fluid levels are again monitored. Drilling operations resume when all is normal.

The blowout equipment is composed of redundant mechanisms that close the annular area between the drill pipe and the hole. The BOP stack is typically composed of an annular preventer, two pipe-ram preventers, and a blind-ram preventer. At least two chokes are provided in the choke manifold. Two pumps are available. The casing is designed to contain the maximum expected pressures shut in at the surface. Valves on the rig floor are used to shut in the inside of the drill pipe. Gas-busters and de-gassers are used to remove gas from the mud as it is circulated out of the hole. Approximately 500 bbl of surface pit capacity is available for storage and circulation of mud. Mud pumps used for drilling are also used to circulate the kick out of the hole.

BOP drills are performed and timed on the rig several times during drilling to verify that the well can be shut in quickly and properly. The driller and toolpusher would all have certified BOP training in well control that is renewed every two years.

Backup systems and procedures are available for surface control of a kick if, for some reason, the weighted circulation procedures fail to provide the required control. It might be necessary to bullhead the formation liquids in the wellbore back into the formation. This is accomplished by pumping down both the annulus and the drill pipe at the same time and forcing the liquids back into the formation. The well is then circulated with kill mud weight, and drilling resumes. It might also be necessary to pump heavy mud and then bleed off some of the annulus pressure. This is done through the choke manifold at a controlled rate such that the formation liquids are controlled. Another technique that is employed in an underground blowout situation (flow of formation liquids from one formation into another, uncontrolled) is the dynamic kill procedure. This entails pumping the kill fluid at a rate high enough to overcome the loss zone and kill the flow. Other manifestations of these basic techniques may be used depending on the situation.

Well Suspension and Abandonment

Upon completion of drilling operations, the well will be plugged and abandoned or suspended in compliance with state and federal regulations, as appropriate. Well suspension and abandonment procedures must also comply with the AOGCC requirements of 20 AAC 25. If the well is abandoned, the abandoned casing stub will be cut and marked in accordance with AOGCC regulations. All equipment and supplies will be removed and the site will be cleaned of any refuse.

2.1.7 Transfer Procedures

Employees must follow the ASH procedures for conducting flammable and combustible fluid transfers. Employees are required to review a BMPs Checklist (Form 2.1-3) prior to conducting fuel transfers and follow the outlined steps throughout the transfer process.

BMPs for spill prevention are established through the adoption of guidelines and operating procedures. At the drill site, there would be two types of fuel transfers which take place: drill-rig-related fuel transfers and fuel transfers related to exploration support activities (e.g., rig-camp fuel supply and vehicle fueling).

The procedures for both types of fuel transfer are the same. The procedures listed in Form 2.1-3 and the guidelines listed in Attachment 2.1-A shall be followed. For any other fuel transfers, employees and contractors shall use the same procedures as listed above. Information on personnel safety and safe handling procedures for fluid transfer protocol follows the best management practices of North Slope Operations as compiled from the Flammable & Combustible Fluid Transfer Policy, North Slope Fluid Transfer Guidelines and the ASH. The BMPs for Fluid Transfer can be found in Attachment 2.1-A at the end of Section 2.1.

The primary prevention mechanism against discharge during the transfer of liquids is the use of surface liners at all inlet and outlet points. Mandatory use of drip liners and pans is incorporated in the North Slope Unified Operating Procedures (UOP), summarized from the North Slope Environmental Handbook. Surface liners, also known as drip liners, protect the ground surface from contamination during fuel and chemical transfer. North Slope Energy supplies contractors with liners and training in their proper use. The UOP mandates the use of liners for:

- Vacuum trucks
- Fuel tankers
- Sewage trucks
- Chemical delivery units
- Chemical transfer units

- Fluid transfer within facilities

Any person involved in fluid transfer is expected to perform this work in accordance with BMPs fluid transfer guidelines described in the North Slope Environmental Handbook and Attachment 2.1-A. Procedures for fuel tank transfers are as follows (also see Form 2.1-3):

Fuel and other fluids would be transported to the drill site via existing gravel and ice/snow roads. The person responsible for the individual system at the drill site will be the operator-in-charge during fluid transfer operations and will assign and instruct all personnel involved in the transfer in their duties and responsibilities (to include the fuel tanker driver). The qualified person responsible for fuel transfers will also ensure that all equipment, storage tanks, and transfer lines at the drill site are operational before any transfer begins. He/she will ensure that drip pans are in place at all valves and couplings and the following prevention measures are performed:

- Require vehicle chocking.
- Require the fuel delivery driver to remain at the vehicle during loading/offloading.
- Transfer operations consist of a minimum of two operators and are never left unattended. The two observers must remain in direct line-of-sight, in constant radio communication, and with one person having the ability to immediately shut off the transfer operation. These two observers must not leave the operations until the transfer is terminated or completed and all remaining fuel in the hoses has been evacuated and the connections to the tanks have been broken.
- For transfer between tankers and tanks, manual shutoff valves are readily available to the operator to stop transfers.
- Prior to transfer being initiated between tank vehicles and fuel tanks, tank levels are measured using a staff or sounding line and the tank volume calculated with allowance for product expansion.
- Tank levels, containment, absorbents, and piping are inspected after each transfer for signs of fuel or chemical loss, leakage, or failure. Off-pad and remote-site operations are conducted in accordance with BMPs (Attachment 2.1-A).

In addition to the guidelines presented in the ASH, the following fluid transfer requirements are in effect:

- Pre-job safety and health meetings provide employees information on their role in the overall scope of the work, review guidelines, and stress the importance of avoiding spills. Effective communication and planning are key factors in preventing spills.
- Access to all areas of the pad is maintained at all times for emergency vehicles.

Fuel flow diagrams, valving details, and safety and health precautions for the drill rig are listed in the drilling contractor's Spill Prevention, Control and Countermeasure (SPCC) Plan. The SPCC Plan for each drill rig is kept on site during drilling activities.

During drilling activities, a tanker is used to refuel equipment. These transfer operations are conducted with the fueling delivery driver in constant attendance. Drip pans would be utilized under all fueling-hose transfer connections. The fueling vehicle also carries absorbents, waste containers, and tools to contain and clean up minor drips and spills.

2.1.8 Operating Requirements for Exploration and Production Facilities

General Facility Requirements

Production Tests

Oil produced during a formation production test or other drilling operation must be collected and stored in a manner that prevents oil from entering the lands or waters of the state. If production tests are conducted, produced fluids will be collected and stored in mobile tanks. These tanks would be placed in lined secondary containment with the capacity to hold the contents of the largest individual tank or any group of tanks if manifolded together.

Platform Integrity Inspections and Isolation Valves for Pipelines Leaving Platforms

These requirements do not apply.

Drip Pans and Curbing

These requirements do not apply to onshore exploration wells. However, drip pans or portable containment would be utilized at transfer locations. Tanks placed in service after December 30, 2008 would be equipped with fixed spill containment at each fill connection to capture leaks when a transfer hose of pipe is disconnected.

Wellhead Sumps

The material used for impermeable wellhead sumps is a steel plate. The steel of the well cellar is welded to the conductor pipe hence providing an impermeable barrier to the earth. Sufficiently impermeable wellhead sumps would be utilized for all wells drilled.

Sufficiently Impermeable Deck with Catch Tanks

These requirements do not apply as no marine structures are involved.

Oil Storage Tanks

Information pertaining to compliance with oil storage tank requirements is located in Sections 2.1.9, 2.1.10, and 3.1.2.

Piping

These requirements do not apply as metallic facility oil piping would not be utilized in connection with oil storage tanks 10,000 gal or greater.

2.1.9 Oil Storage Tanks

North Slope Energy's drilling operations will use welded, steel tanks with less than 10,000-gal capacity for on-site storage of diesel fuel. The tank(s) would be located within secondary containment that provides at least 110 percent secondary containment of the capacity of the largest tank.

Tanks greater than 10,000 gal but less than 75,000 gal in capacity would comply with the requirements of 18 AAC 75.066. Tanks that were constructed prior to December 30, 2008 must possess structural integrity inspection records in compliance with American Petroleum Institute (API) 653, Steel Tank Institute (STI) SP001, or another standard approved by ADEC. Tanks placed in service following December 30, 2008 and before or after May 17, 2022 must comply with inspection standards STI SP001

or API 653 or another equivalent standard approved by ADEC. Inspection records would be maintained for the service life of the tank.

If conducted, production flow testing would utilize welded steel tanks (per site), ranging up to 400 bbl (16,800 gal) each. These tanks will comply with ADEC's construction and inspection standards for shop-fabricated tanks (18 AAC 75.066), as well as all other state regulatory requirements. Description of specific tanks, quantity, and capacity will be provided if production testing is to be performed and/or ADEC-regulated tanks are required. During testing operations, theses tanks will be continuously monitored to prevent overfilling the tanks with fluids (crude oil, gas liquids, and/or water) from the well. These tanks will be provided with 110 percent secondary containment capacity (18 AAC 75.075). Refer to the site-specific addenda for the details of production test tanks in the event they would be utilized for a specific well project.

All liquid-level determination and overflow protection is accomplished by direct measurement and visual inspection of the tank levels by transfer personnel. Procedures for transferring liquid are presented in Section 2.1.7. The results of BAT analysis for this procedure are presented in Section 4.7.

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Form 2.1-3
Fuel or Chemical Transfer Checklist

1. _____ Verify that you are following the Alaska Safety Handbook (ASH) "*Flammable and Combustible Fluid Transfer Standard*", North Slope Environmental Field Handbook "*Fluid Transfer Guidelines"*, and the Unified Operating Procedure for the use of surface drip pans and liners.
2. _____ Identify the flashpoint and temperature of fluids you are transferring or mixing using MSDS.
3. _____ Two persons are required to conduct large fluid transfers (bulk-product transfer): An equipment operator and observer who must maintain constant radio communication throughout the operation. Neither of the persons observing the transfer will be allowed to leave their position at any time or for any reason, until the transfer is either terminated or completed.
4. _____ Ensure that all ignition sources have been moved a safe distance away from the transfer operations and that fire extinguishers are available.
5. _____ Ensure electrical bonding straps or grounding hoses are properly connected between all equipment involved in the transfer.
6. _____ Prior to transfers, check all tank and container levels, valves and vents to prevent overfilling.
7. _____ Prior to transfers, inspect all tanks, pipes, and hoses for signs of damage or excessive wear.
8. _____ Conduct brief safety and health meeting with delivery personnel to brief them on their role in the transfer procedure.
9. _____ Use sorbents, portable liners or metal drip pans under all connections and vents to contain potential splashes, leaks, or drips.
10. _____ Set wheel chocks to prevent unintended vehicular movement and use warning markers or signs as appropriate to alert and manage traffic in and around the transfer area.
11. _____ Maintain a constant line-of-sight to all transfer personnel throughout the transfer. Transfer operation must not be left unattended.
12. _____ Tanker vehicle driver must be stationed at the transfer shutdown valve and must remain in position at all times to shut down transfer operations when required.
13. _____ Verify two-way communication prior to starting fuel transfer.
14. _____ Prior to transfers, measure tank levels using a staff or sounding line and determine the available volume of the tank with adequate allowance for product expansion.
15. _____ Check all tank and container levels, tank flanges, drains and outlets, piping, hoses, containment, and absorbents before, during and after each transfer for signs of fuel or chemical loss, leakage, or failure.
16. _____ Following transfers and before leaving the area, ensure all valves are correctly closed and all protective covers and caps are securely positioned.

Description of Secondary Containment Areas

Oil Storage Tanks

Bulk fuel storage tanks at the well site(s) will be in diked, impermeable secondary containment areas. Secondary containment for fuel storage tanks will be constructed to equal or exceed 110 percent of the volume of the single largest tank or any group of tanks if permanently manifolded together. Any objects, such as other tanks, that reduce the storage capacity of the containment will be included in the calculation of the 110 percent volume. The containment area will be lined with product-compatible, high- density polyethylene (HDPE), or similar material; this material generally being 20 to 30 millimeters (mils) thick. Secondary containment will be visually inspected daily for the presence of oil leaks or spills.

The secondary containment areas will be maintained free of debris, vegetation, excessive accumulated water, and other material that might interfere with the effectiveness of the system, including excessive accumulated snow and snowmelt. Water from secondary containment areas will be inspected to ensure that no oil is present. Written records of each drainage operation would be maintained for at least five years.

Loading Racks

Loading and off-loading activities at a temporary winter exploration site do not fall under guidance or regulation associated with permanent loading and off-loading facilities. North Slope Energy's fuel transfer and portable liner policies provide a reliable and effective means of mitigating the potential effects of spills.

2.1.10 Facility Piping Corrosion Control

Metallic facility piping as defined at 18 AAC 75.990(171) will not be used in connection with oil storage tanks of 10,000 gal or greater.

Attachment 2.1-A
Best Management Practices and Procedures
FLUID TRANSFER PROCEDURES

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FLUID TRANSFER PROCEDURES

The following information on personnel safety and safe handling procedures for fluid transfer protocol follows the BMPs of North Slope Operations as compiled from the Flammable & Combustible Fluid Transfer Policy from the ASH. Information on the use of drip liners and pans is summarized from the North Slope Environmental Handbook (Current Year).

Goal and Objectives:

The goal of the Flammable and Combustible Fluid Transfer Policy is to establish minimum requirements to protect the safety and health of North Slope Energy and contract employees when using vacuum and tankers to transfer flammable and combustible fluids to or from non-permanent facilities. The objectives of the policy are:

- Ensure that equipment used during transfer of flammable and combustible fluids meets applicable requirements.
- Ensure that the layout of equipment adequately separates potential ignition sources from potential sources of flammable or combustible vapors or liquids and provides for personnel egress.
- Ensure that all personnel involved in transfer operations use appropriate precautions for handling flammable and combustible fluids.
- Ensure vacuum units shall never be directly hooked up to pressure lines or vessels. Tanks are not considered pressure vessels. Fluids discharged from pressurized sources are to be flowed into tanks rather than directly to the vacuum unit.

Exceptions:

Equipment fueling operations, permanent loading and unloading facilities (e.g., bulk fuel loading dock, oily waste, recycle facilities, and fixed chemical tanks), pumping fluid into a well, flowline, or other permanent facility, or routine use of a drill site or well pad bleed tank will continue according to established safe operating procedures.

Responsibilities of Vehicle Contractor/Operator:

- Ensure proper training, safe operation, and maintenance of their equipment.

Qualified Fuel Transfer Operator:

A qualified fuel transfer operator shall perform the following pre-job checkout before the start of any flammable or combustible fluid transfer to or from a non-permanent facility. If a particular situation cannot meet specifics of the following requirements, the qualified fuel transfer operator will take appropriate steps to safeguard personnel and equipment.

- Inspect the site of the loading and unloading operations. Conduct a pre-job safety discussion and a job scope review, including the potential hazards of the work and emergency procedures, with all participants.
- Survey the vehicle and equipment to assure compliance with the policy criteria.
- Review loading positions, emergency escape routes, and fire lanes.
- Complete a pre-job safety meeting identifying potential hazards and escape routes. Identify a minimum of two emergency exit paths leading away from the transfer area for personnel egress.

A minimum of two exit routes must be a minimum unobstructed width of 5 ft and should be established perpendicular to the prevailing wind direction.

Ensure the following:

- Two-way radio communication is used and one of the individuals has the ability to immediately shut off the transfer operation.
- Review the wind direction relative to the tank vehicle and equipment layout. Monitor the prevailing wind conditions so any potential sources of hydrocarbons are kept at least 25 ft downwind of any potential ignition source.
- Locate the inlet and/or outlet piping (tank connections) and vehicle-mounted fluid pumping equipment 25 ft or more downwind from any potential ignition source on the site or on the back of the delivery vehicle.
- The tanker and/or tank involved in the transfer should be separated by at least 25 ft.
- Review positions of fire extinguishing equipment, and ensure the operator is trained in its proper use.
- Maintain a minimum unobstructed pathway of 20 ft for fire and emergency vehicle access to the transfer area.
- Assure continuous electrical bonding between transfer equipment.
- Use the Unit Work Permit with the checklist on the back of it, for all operations covered by this policy when a North Slope Energy representative is not present for the entire transfer.
- Note that when venting at low ambient temperatures, there is potential for the vented gas to condense and possibly freeze off the vent and check valves. Ensure that when applicable, the operator monitors the condition and takes appropriate actions to mitigate the hazard.
- Test the means of communication for proper function before transfer begins.

Additional guidelines for solid waste handing ("supersucker" or "guzzler") operations:

- Flammable and combustible fluids to be "supersucked" or "guzzled" must be at least 40 degrees Fahrenheit (°F) below their flash point.
- Liquid flash point measurement will be required for "supersucker" or "guzzler" operations as warranted by the North Slope Energy Representative. Frequent tests are suggested, especially where the material may not be homogeneous.
- Ensure the North Slope Unified Operating Procedures on the use of drip pans/surface liners is followed for environmental protection, as described in the North Slope Environmental Field Handbook.

North Slope Fluid Transfer Guidelines

Note: SAFETY is the first and foremost goal in all operations, including the transfer of all fluids. It is EVERYONE'S responsibility to ensure all related safety and environmental guidelines are being followed at all times.

- Check your vehicle and/or equipment. Ensure that it has been properly maintained and that there are no leaking parts. If your vehicle or equipment does not appear to be in proper order and leaks are apparent, stop the job and have adequate repairs done. In accordance with the field operating procedures, a surface liner may be used for a short period of time under critical use equipment.
- Stage vehicles away from water bodies, tundra, and wildlife habitats. Staging or parking of vehicles and equipment in off-pad locations or on-pad edges should be avoided whenever possible.
- Position equipment so that valves, piping, tanks, and sensitive components are protected from damage by other vehicles or heavy equipment.
- Verify that you have adequate secondary containment and absorbent pads on hand. Utilize as per published field operating procedures.
- Before starting any fluid transfer operation, inspect all hoses, connections, valves, and associated components. Ensure that these items have been properly maintained; gaskets are present and in good shape; all valves are checked to verify they are in the proper on/off position, and that each connection is tightened properly.
- Prior to the actual fluid transfer, check all tank and container levels, valves, and vents to prevent overfilling or accidental releases.
- Use secondary containment under all appropriate connections, vents or any other likely source of spillage. Use as many secondary containers as are practical, or as are required per the published field operating procedures.
- Upon starting the transfer of liquids, keep line of sight with operator and/or all connections, hoses, vents or any other likely source of spillage. Be prepared to stop proceedings if any leak is noticed. Do not attempt to repair a leaking situation while fluid is being transferred. Always stop operations to fix leaks.
- Maintain a constant line-of-sight with critical components throughout the transfer. Transfer operations must not be left unattended.
- Two-way radio communication is used and one of the individuals has the ability to immediately shut off the transfer operation.
- After transfer is complete, take every precaution while breaking connections. Secondary containment and sorbent pads must continue to be used until the rigging down process is complete.
- Check all tank and container levels after each transfer for signs of spills. Immediately report all spills to your supervisor.

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2.2 DISCHARGE HISTORY

Cross-reference:

18 AAC 75.425(e)(2)(B)

No oil discharges over 55 gal have occurred in connection with North Slope Energy's West Inigok Area Exploration program.

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2.3 POTENTIAL DISCHARGE ANALYSIS

Cross-reference:

18 AAC 75.425(e)(2)(C)

2.3.1 General

Potential spill sources associated with exploration drilling activities can be loosely grouped into minor operational spills, catastrophic tank failures, or well blowouts. These are discussed in the following sections. Table 2.3-1 summarizes the possible maximum discharges of liquid hydrocarbons (including crude oil) that might be expected from various sources.

2.3.2 Minor Operational Spills

Minor operational spills could result from a wide variety of causes including hose/line failures, tank overflows, equipment leaks, etc. Historically, spills of this nature are typically less than 10 gal of diesel or lubricants.

Minor spills normally would be detected within several hours, if not immediately (such as in the case of overfilling a fuel tank) during routine inspections and because the operations area is confined. Very small spills (such as equipment leaks) may go undetected for longer periods of time. Minor spills would be typically contained on site and removed by on-site personnel as soon as they are detected.

2.3.3 Catastrophic Spills

Other than a blowout, the only source for a major catastrophic spill would be from the failure of an on-site diesel storage tank. For a storage tank, a flange failure or mechanical puncture is the most probable source of spills. A spill of this type is considered to have a very low probability of occurrence.

On active drill sites, a major spill from a diesel storage tank would be detected immediately (visually, audibly, or by vapors) by the numerous personnel engaged in 24/7 operations. Spill response equipment maintained at the drill site ensures prompt response in the unlikely event of this type of spill.

As a precaution, oil storage tanks are contained within secondary containment which has at least 110 percent of the capacity of the largest storage tank in the containment area. If the secondary containment area were to fail, diesel fuel would still likely remain on the gravel or ice pad, because of the policy of positioning of tanks away from water bodies and at a distance from the edge of the pad as well as berming around the site.

2.3.4 Well Blowouts

A well blowout would be the source of the largest potential spill. For planning purposes, a blowout rate of 5,500 barrels of oil per day (bopd), continuing for a period of 15 days until it is extinguished through surface-control methods. Based upon drilling experience and technical development, the risk of an uncontrolled blowout is highly unlikely.

2.3.5 Potential Areas for Spills

Table 2.3-1 provides potential spill sources, the types of failures that could occur, estimates of spill sizes, and appropriate prevention measures.

The following are considered potential areas for spills:

Drilling Operations

- Surface Hole
  - Shallow gas blowout
- Below Surface Hole
  - Blowout while drilling (unknown reservoir or unknown pressure)
  - Blowout while tapping primary reservoir or side-track reservoir

Transfer Operations

- During transfer of fluid/fuel from or to the drill rig

Equipment Failures

- Failures (ruptures) in tanks, hoses, and lines (by either nature or man-made)

Table 2.3-1
Analysis of Potential Discharges

Type	Cause	Product	Size	Duration	Actions Taken to Prevent Potential Discharge
Blowout	uncontrolled flow from wellbore	crude oil gas condensate	82,500 bbl	15 days	Blowout prevention equipment (blowout preventer, mud, etc.)
Diesel (Spill)	tank rupture	diesel	< 10,000 gal	minutes to hours	Secondary containment; tank inspection program
Oil (overflow, fuel line failure, leak)	transfer failure	crude oil	100 gal	minutes	Transfer procedures in place; secondary containment
Diesel (overflow, fuel line failure, equipment leaks, etc.)	transfer failure from fueling tanker to tanks	diesel	50 gal	minutes	Transfer procedures in place; secondary containment

2.4 CONDITIONS THAT INCREASE DISCHARGE RISK

Cross-reference:

18 AAC 75.425(e)(2)(D)

Conditions specific to North Slope Energy's West Inigok Area operation that potentially increase the risk of discharge, and actions taken to eliminate or minimize identified risks are summarized below.

High Temperature - Heat may cause gases to expand and increase the likelihood of discharge. North Slope facilities and drilling procedures are engineered to accommodate temperature fluctuations.

Low Temperature - Low temperature could cause some materials to embrittle or to contract differentially, increasing the risk of failure. Fluids in pipes or tanks could freeze or become gelatinous, potentially rupturing pipes or tanks, as well as reducing the ability to pump fluids. Valves or other equipment could freeze, not allowing them to respond in a manner to prevent discharges. North Slope drilling rigs and equipment are specifically engineered to function reliably in arctic conditions. At temperatures below -40 °F, steps are initiated to suspend non-critical drilling operations if extremely low temperatures persist to reduce the likelihood of equipment failure.

Weather Conditions - The operation most likely to be potentially affected by adverse weather conditions is the drilling support operations such as transportation activities between the drill site and major staging areas. Strict adherence to vehicle safety and speed limits minimizes the potential for vehicular accidents, which may cause a spill. Reflectors and warning signs will be located at traffic and caution areas in the vicinity of the drilling rig and at regular intervals along any of the ice/snow roads.

Sabotage or Vandalism - The potential from any sabotage of vandalism is slight. The most likely contact (though of low probability) would be from vandalism. Security, constant vigilance by North Slope Energy employees and contractors should detect and intervene in time to prevent any damage at any of the drill sites.

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2.5 EXISTING AND PROPOSED DISCHARGE DETECTION PROCEDURES

Cross-reference:

18 AAC 75.425(e)(2)(E)

2.5.1 General

One of the primary spill-detection methods will be routine visual surveillance at the active drill sites. Daily visual inspections will be conducted by operators, contractors, and employees. Employees are responsible for conducting visual inspections of their work areas and contacting the North Slope Energy operator for cleanup activities. Employees at the drill sites will be cautioned to be especially alert during operations that might result in a spill, such as fuel or product transfers.

Specifically, North Slope Energy operations personnel and/or the drilling contractor will have primary responsibility for conducting routine inspections (once per shift or as otherwise noted) of their equipment and the site. An inspection log will be maintained to document inspections of facilities and report any remedial actions required. A record of the inspection log will be maintained at the drill site. Records may be digitized and shall be maintained for a minimum period of five years. The inspection includes:

- Inspect all engine-fuel day tanks and associated fuel lines and valves for freedom of fuel flow and leaks.
- Check fuel supply lines from bulk-storage tanks for leakage. Verify surface liners are used under supply line and piping connections where appropriate. Ensure that supply lines laid for miscellaneous use (e.g., BOP accumulator, camp tank, hot air heaters, boilers) are intact, and all control valves are functional and in the correct operating position, ensure that no ice blockage exists from accumulated water.
- Inspect all bulk-storage fuel tanks. Ensure that all vents are open, all bottom valves are functional and in the correct operating position. Report fuel volumes as directed. Bottom tank valves will be left closed at all times fuel is not being transferred. Bottom tank valves, which are not connected to piping, shall be blanked off by blind flanges or bull plugs at all times.
- Inspect and document at least weekly the condition of all secondary containment and check for any signs of leaks from storage tanks. Ensure the liner material is intact and no excessive accumulation of water or snow is present that would significantly diminish the required holding capacity of the system. Inspect and ensure accumulated water is free of oil prior to discharge and prepare a written record of each drainage operation.
- Coordinate the transfer of bulk fuel to, from, or on the drill site with the North Slope Energy Drill Site Manager (to ensure that no “Hot Work” is being performed near the transfer location that may provide a source of ignition). Ensure that all transfer valves are left in the closed position and that all transfer hoses and lines remain intact after each transfer. Follow transfer procedures outlined in Section 2.1.7.
- Verify that equipment maintenance is kept up to standards and that proper on-site procedures are being followed. If leaking equipment is found, take immediate steps to secure the leak and clean up any spills to the environment. Use surface liners wherever possible to ensure spills are prevented and replace defective equipment immediately.

- Confirm proper use of portable liners or sorbents for vehicles and equipment.
- Ensure appropriate use of traffic markers and warning signs around oil tanks, transfer piping, temporary supply lines, and mobile equipment. Check to ensure rigid piping is adequately supported and secure from abrasive movement or vibration.
- Check to confirm there are no overturned containers on or near facilities. If found, take appropriate steps to determine the condition and contents of the container and rectify the situation.
- Verify all transportation loads are properly attended and secured.
- Note any spills or spots on the pad. Ensure spills have been properly reported and cleanup actions initiated promptly.
- Be alert for potentially dangerous animal situations and take appropriate steps to ensure safe operations.
- Visually inspect the mechanical condition of tanks, lines, and pumps.
- Verify for correct positioning of flow line valves.
- Verify proper operation of relief valves.
- Inspect fluid levels in drip pans, containment pits, etc.
- Inspect for condition of drains (ensure clean and unfrozen).
- Check the general condition and cleanliness of rig.
- Periodically inspect the condition of pre-staged, spill-removal equipment and material.
- Check snow removal status.
- Check outer edges of drill site to ensure there is no seepage from pad.

2.5.2 Storage Tank Overfill Protection

Diesel Tanks

The diesel storage tanks have no automatic fluid-level control devices. Tank fuel levels are monitored and controlled manually. Fuel transfer procedures are described in Section 2.1.7 and are relied on to protect against tank overfill. Additionally, fuel transfer responsibilities are outlined in Attachment 2.1-A.

Day Tanks

The rig day tank will have an overfill float and automatic alarm that sounds over the rig intercom. Additionally, the day tanks for the diesel engines and heaters are located within the rig or the support equipment. These tanks are provided with drip pans at all pipe couplings and the tank vents are piped back to their respective storage tank to further reduce the probability of potential spills resulting from tank overfilling.

Testing of Overfill Prevention Devices

Portable diesel storage tanks have no automatic fluid-level control devices. Tank fuel levels are monitored and controlled manually adhering to fluid transfer procedures (refer to Section 2.1.7, Form 2.1-3, and Attachment 2.1-A).

2.6 WAIVERS

Cross-reference:

18 AAC 425(e)(2)(F)

18 AAC 75.430(b)

North Slope Energy is not requesting any waiver for its operations.

North Slope Energy commits to providing the following information as part of the plan prior to the commencement of drilling operations at each site:

	Information	Alternate Schedule Basis
1.	Contacts numbers of key on-site personnel and the rig camp.	Telephone service will not be established until closer to the winter drilling season.
2.	Details on oil storage tanks with capacity greater than 10,000 gallons, if used in conjunction with operations.	Specific tanks would be selected prior to the onset of drilling operation each year.

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3.0 SUPPLEMENTAL INFORMATION

3.1 FACILITY DESCRIPTION AND OPERATIONAL OVERVIEW

Cross-reference:

18 AAC 75.425(e)(3)(A)

18 AAC 76.066

3.1.1 Facility Ownership and General Site Description

North Slope Energy plans to drill up to two exploratory wells during the 2023 winter season in the area west of Inigok Airstrip within the NPR-A. All planned exploratory drilling projects would be conducted upon ice pads using overland packed snow roads originating from Drill Site 2P and extending west across the Colville River to the West Inigok Area exploration drill sites. The route will continue west past the Inigok Airstrip to the farthest well site. An ice pad will be constructed, approximately 500 ft by 400 ft in size, adjacent to DS-2P to provide space for storage and fuel storage and transfer. Access routes will be constructed and maintained using the generally accepted practices for the North Slope, subject to BLM and Alaska Department of Natural Resources (ADNR) tundra opening criteria. Pre-packing of the trail will be requested prior to the official tundra opening to preserve early snow.

For the first drilling season, the All American 111 drill rig will be mobilized to drill up to two well sites located within approximately 18 miles west of Inigok Airstrip. Ice roads from Inigok will be constructed for project mobilization and operations and include staged response equipment, storage tanks, camp, and ice road and pad construction equipment.

Wells are planned as single, vertical wellbores drilled into potential liquid hydrocarbon zones. Well formation evaluations via open and cased hole logs will be performed during the drilling at all wells. At completion of formation evaluation, wells will be plugged and abandoned in compliance with AOGCC and BLM requirements.

North Slope Energy will develop and submit all required permit applications for site-specific exploration drilling projects. The site-specific addenda provide relevant supplemental information for each project to address additional ODPCP information described by the core plan document.

3.1.2 Oil Storage Containers

Refer to the site-specific addenda for details regarding the specific tanks used for drilling projects.

3.1.3 Transfer Procedures and Major Fueling Areas

Transfer operations will only occur on the drill pads. The fuel transfer procedures (Section 2.1.7 and Attachment 2.1-A) will be followed to protect against accidental tank overfill. Tank liquid levels would be measured prior to transfer operations to determine the available volume and transfers closely monitored during fueling operations. Strict adherence to staffing, communications, and emergency shutdown requirements provides a reliable and effective means of preventing tank overfill.

3.1.4 Crude Oil and Reservoir Characteristics

North Slope Energy's prospects are located within leases located west of Inigok in the NPR-A. The purpose of North Slope Energy's program is to delineate the reservoir and evaluate its commercial viability. The primary target reservoir objectives are Nanushuk sands.

3.2 RECEIVING ENVIRONMENT

Cross-reference:

18 AAC 75.425(e)(3)(B)

Alaska Inland Area Contingency Plan

Arctic and Western Alaska Area Contingency Plan

ACS Technical Manual

Tundra Treatment Guidelines − A Manual for Treating Oil and Hazardous Substance Spills to Tundra

The North Slope Energy onshore winter exploration area is located west of Inigok and east of the Ikpikpuk River. The project area is largely defined by the Arctic Coastal Plain and Ikpikpuk River which provides important habitat for wildlife. Projects will be conducted during the winter season when the ground and water surfaces are completely frozen. A thick layer of continuous permafrost in the region impedes drainage, thus creating saturated soils with thick organic horizons.

During North Slope Energy winter exploration activities, several species of wildlife may be present. Arctic foxes, one of the predominant mammalian predators, may be present throughout the project area. Polar bears, considered one of the predominant mammalian predators, are generally more likely to be encountered to the north of the project area closer to coastal areas; however, it is possible that some polar bears may travel the Ikpikpuk River drainage to the project area. The Ikpikpuk River drainage provides freshwater habitat for burbot, northern pike, and Arctic cisco and anadromous species including pink and chum salmon. Moose, caribou, muskoxen, and wolverine are present in the area, as well as smaller species, such as lemmings and voles. Avian species that may overwinter in the exploration area include snowy owls, willow ptarmigan, rock ptarmigan, gyrfalcons, hoary redpolls, and ravens. Endangered and threatened migratory avian species are absent in winter.

3.2.1 Routes of Travel to Open Water

Drilling will be conducted on land surfaces after freeze-up; therefore, open water is unlikely to be encountered. Snow and ice conditions exist on ground and water surfaces throughout the planned drilling season. North Slope Energy will cease operations and be off of the tundra prior to breakup. In the event a spill impacts tundra, containment, recovery, and rehabilitation tactics for tundra would be conducted using the Tundra Treatment Manual, Alaska Inland Area Contingency Plan, Arctic and Western Alaska Area Contingency Plan and the ACS Technical Manual. It would be a response priority to remove all the oil possible before the onset of spring thaw to minimize lasting tundra damage and speed rehabilitation. Refer to site-specific addenda for specific information that identifies water bodies in the vicinity of the proposed exploratory wells.

3.2.2 Response Planning Standard (RPS) Volume to Open Water

Winter exploration operations would be ended prior to breakup; therefore, no portion of the RPS volume of spilled oil is expected to encounter open water. In the unlikely event of a spill, response would focus on cleanup of the oil prior to breakup, confirmed through site monitoring as necessary.

3.2.3 Vegetation

Proposed exploration drill sites in the West Inigok Area are expected to occupy an area typical of the coastal plain featuring permafrost including polygons, pingos, shallow lakes, and thermokarst meander and beaded streams. Vegetation features include wet sedge tundra plant communities, riparian willow groves, and many lichen types.

3.2.4 Wetlands

Wetlands cover approximately 80 percent of the Arctic Coastal Plain and Arctic Foothills regions (ADF&G 2006). The detailed locations of the proposed exploratory wells, adjacent water bodies, and surface pathways are presented in site-specific addenda.

3.3 COMMAND SYSTEM

Cross-reference:

18 AAC 75.425(e)(3)(C)

Alaska Incident Management System (AIMS) Guide for Oil and Hazardous Substance Response, November 2002, Revision 1

Alaska Regional Contingency Plan

3.3.1 Command System

All emergency response situations will use the Incident Command System (ICS), which provides clear definition of roles and lines of command, together with the flexibility for expansion or contraction of the organization as necessary. Under this system, the first person discovering or responding to an emergency situation becomes the IC (person-in-charge) until that individual relinquishes authority to another person better able to control the situation.

Details of the management structure in a spill response are provided in the AIMS Guide. Government coordination of spill response is conducted in accordance with guidance provided by the Alaska Regional Contingency Plan, Alaska Inland Area Contingency Plan, and Arctic and Western Area Contingency Plan. ICS position responsibilities and checklists are presented in Appendix B of the AIMS Guide. Note that the SRT generally fulfills the function of the Facility Response Team, Section 3 of the AIMS Guide.

In most Level I incidents, on-site personnel trained in spill response possess the capabilities to effectively control the incident. North Slope Energy's Drill Site Manager would fulfill the role of IC. Witt O'Brien's would be activated to stand by for all spills until an assessment is performed. Once the assessment is complete, Witt O'Brien's is either released from standby or mobilized.

For Level I incidents, when the safety and health of any personnel is threatened, the material is unknown or potentially hazardous, or the release cannot be quickly controlled, the rig personnel would report to a secure area until the incident is evaluated by qualified personnel. Once evaluated, the rig personnel would be assigned cleanup duties based on their level of training. The on-site Spill Technician will assist in this effort.

Level II/III responses are initiated by North Slope Energy's Drill Site Manager or designated alternate. The IMT is activated and begins to provide support to the field responders (operations section) and coordinates the collection and distribution of information. ACS provides manpower and equipment resources to assist in spill containment and recovery. ACS ensures that a reserve of trained manpower is available for an extended spill response.

For Level II/III incidents, the rig personnel will be directed to a secure area and await the arrival of emergency response personnel. Depending on the incident, rig personnel may be incorporated into the IMT, when applicable.

The IC would be notified during call-out of the SRT and IMT (the latter for Level II or III response). During Level II events, ACS would provide response personnel and equipment. During Level III events, the IC acts as the company representative for the commitment of out-of-region resources.

Contracts for additional trained personnel are in place through ACS. North Slope Energy and ACS maintain contracts with North Slope-based contractors for additional equipment.

3.3.2 North Slope Energy Incident Response Organization

North Slope Energy's SRT and IMT organizations are illustrated in Figures 3.3-1 and 3.3-2, respectively. Names of individuals that would typically fulfill the roles in the ICS organization of the IMT are listed in the site-specific addenda.

3.3.3 Incident Management Team

The IMT determines strategic objectives and priorities to deal with an incident, approves tactics, and provides overall support to the SRTs. One of the factors that would lead to a decision to activate an IMT would be an incident severe enough to trigger the direct involvement of several response organizations in incident response operations. When this occurs, the IMT would take the lead in interacting with other responding personnel, which can include establishing a Unified Command Structure (Section 3.3.5) and integrating response personnel, as appropriate, into the incident response organization.

Once activated, the IMT would report to the Incident Command Post established by North Slope Energy and Witt O'Brien's in Anchorage. The On-scene Command Post would be set up at the Inigok Staging Pad or the nearest staging area camp. The Inigok Staging Area would be on a permanent gravel pad with year-round access via the Inigok Airstrip.

3.3.4 Crisis Management Team (CMT)

When activated, the CMT determines what additional measures, if any, must be taken to support the emergency response operation, and to identify, evaluate, and proactively address the crisis implications of the incident and incident response operations. The mission of the CMT is to avoid crisis situations for the company whenever possible, and to mitigate crisis situations that cannot be avoided to the maximum extent possible. These responsibilities are generally undertaken outside of the IMT organization, but in full communications with, and in support of the IMT.

3.3.5 Unified Command

For significant oil spills, there may be a FOSC, a SOSC, a LOSC, and North Slope Energy representative as Responsible Party (RP). These individuals will become part of the UC, representing their organization (Figure 3.3-3). UC would be established at the Incident Command Post in Anchorage and On-scene Command Post that would be activated at the Inigok Staging Pad or nearest staging area camp. Each contributes to the process of:

- Determining and establishing overall incident objectives and priorities
- Selecting strategies
- Planning for tactical activities
- Conducting integrated tactical operations
- Using resources efficiently and effectively.

Under the National Contingency Plan, state and federal governments are responsible for pollution response. Federal and state statutes ensure that responses to oil and hazardous substances are conducted in a timely and effective manner. Note that there are additional agency responsibilities that are managed

simultaneously throughout the incident, but not through the joint efforts and combined resources of the UC. These include, as examples: investigation and law enforcement, natural resource damage assessment, restoration activities, and maintaining documentation for possible litigation or cost recovery. Governmental responsibility has three aspects:

- Oversee the RP's actions by setting joint objectives, approving incident action plans, monitoring overall response actions, and approving permits.
- Augment the RP's cleanup efforts when necessary to contain the release, recover the product, and minimize the impact to the environment. These government augmentation efforts are in addition to the oversight tasks described above.
- Take over containment, control, and cleanup operations when necessary.

The federal and state governments participate in these three functions and coordinate them using the unified ICS.

North Slope Energy will respond as the RP for a discharge of an oil or hazardous substance to the water or land of the state. Under state regulations (18 AAC 75.310), it is the responsibility of the RP to contain, control and clean up that discharge. Similar federal laws require RPs to respond to their spills and oblige the RP to direct his/her own containment, control, and cleanup efforts. Even though the RP is required to respond to a spill, the SOSC oversees the RP's containment, control, and cleanup efforts and has the authority to take over or supplement the response activities if the SOSC determines that the response is inadequate (18 AAC 75.320). The FOSC has similar authority under federal law. Additionally, the Oil Pollution Act of 1990 (OPA 90) authorizes the USCG and/or EPA to direct the activities of the RP without taking federal control of the spill cleanup.

3.3.6 Response Escalation Decision

Figure 3.3-4 presents a set of decisions trees to help determine the appropriate Incident Response Organization. (The highest organization determined from the two decision trees may determine the level of response.)

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Figure 3.3-1 Organization of the North Slope Energy Spill Response Team

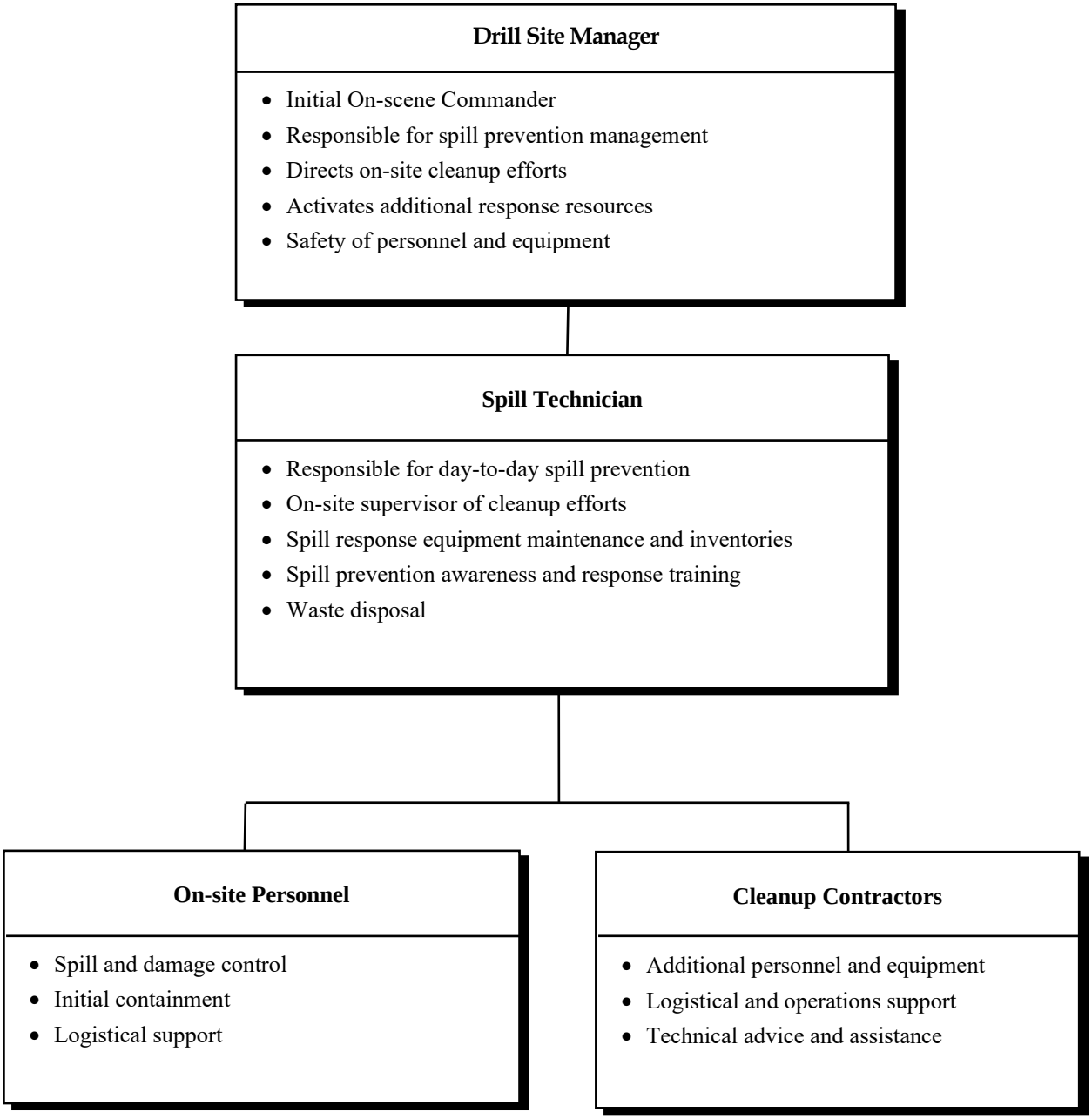


Figure 3.3-2 Organization of the North Slope Energy Incident Management Team

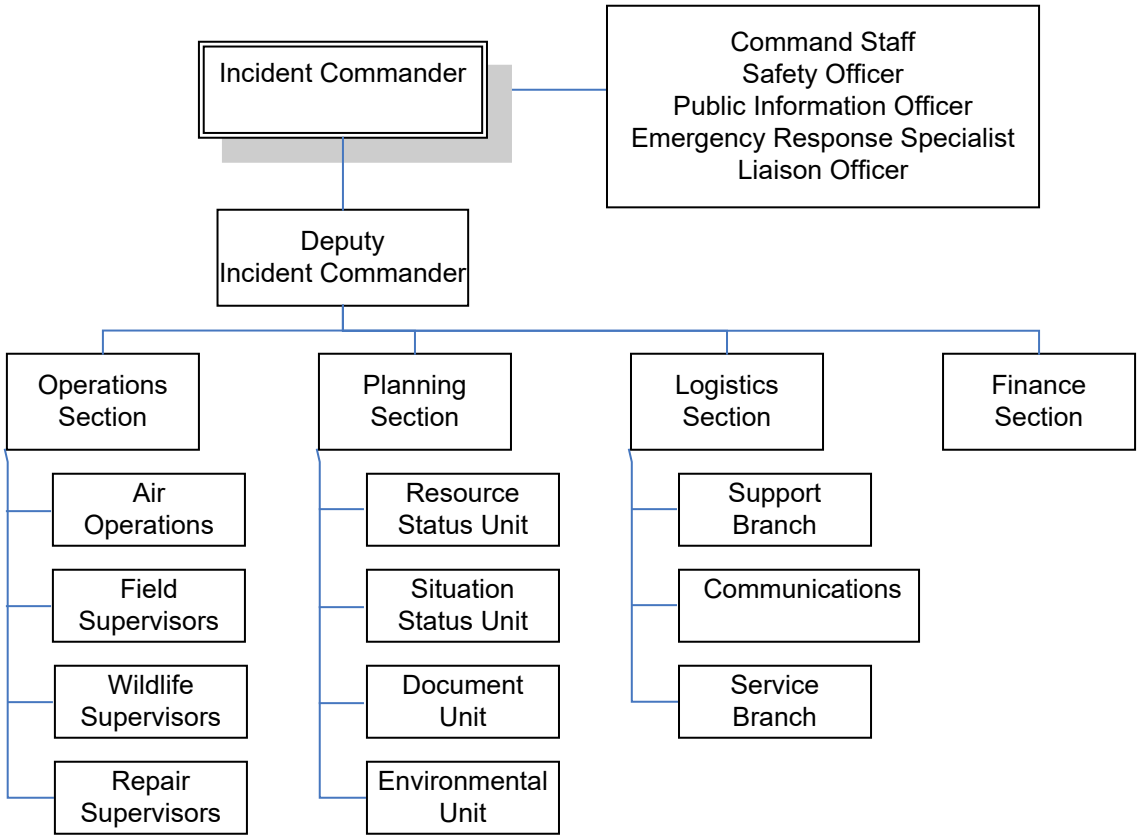
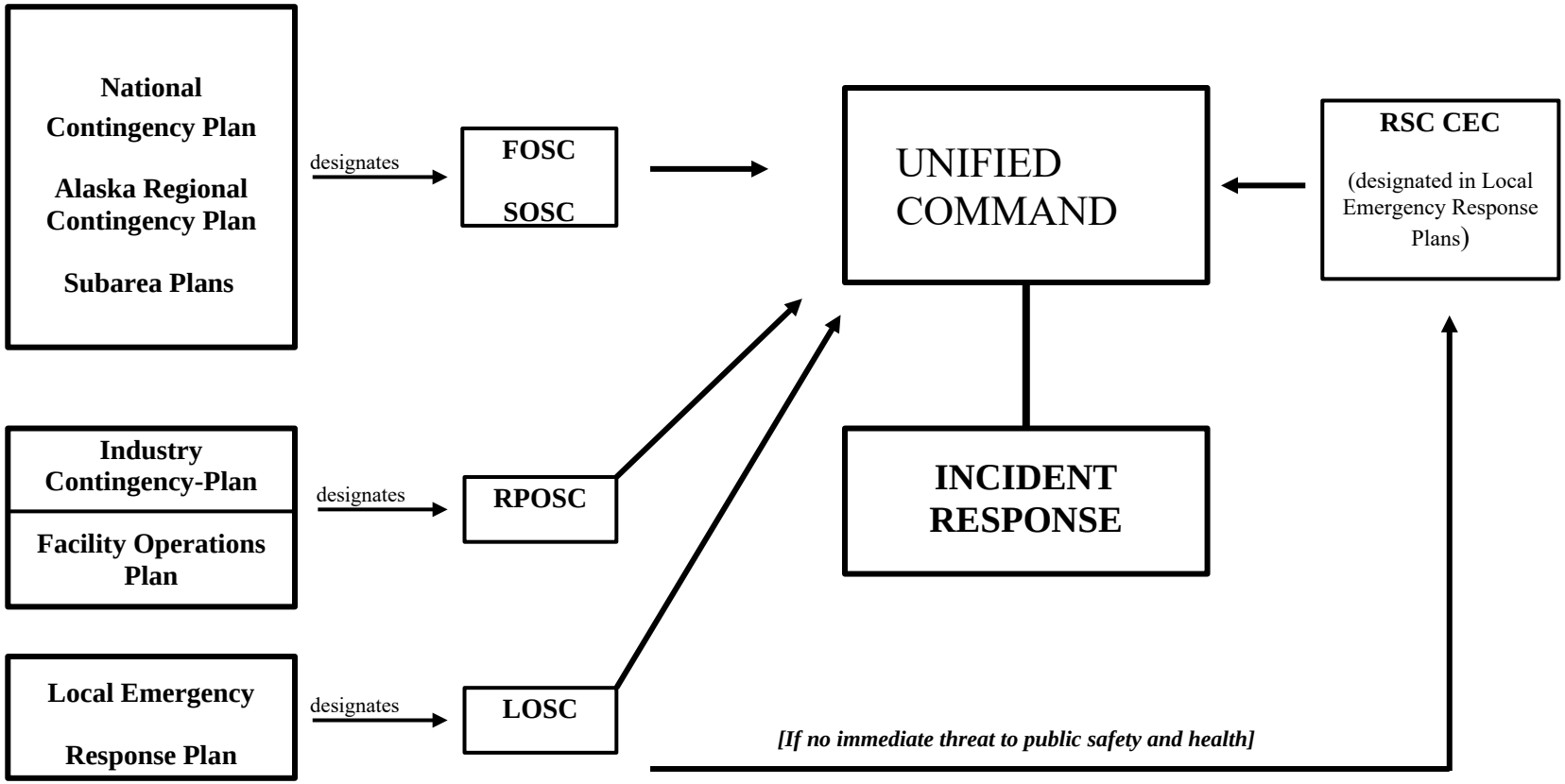


Figure 3.3-3 Organization of the Unified Command



(Source adapted from: *AIMS Guidelines to the Incident Management System*, 2002)

Notes:

CEC =	Community Emergency Coordinator
FOSC =	Federal On-scene Coordinator (US Coast Guard/US Environmental Protection Agency)
LOSC =	Local On-Scene Coordinator (while immediate threat to public safety exists)
RPOSC =	Responsible Party On-scene Coordinator (Spiller Designee)
RSC =	Regional Stakeholders Committee
SOSC =	State On-Scene Coordinator (Alaska Department of Environmental Conservation)

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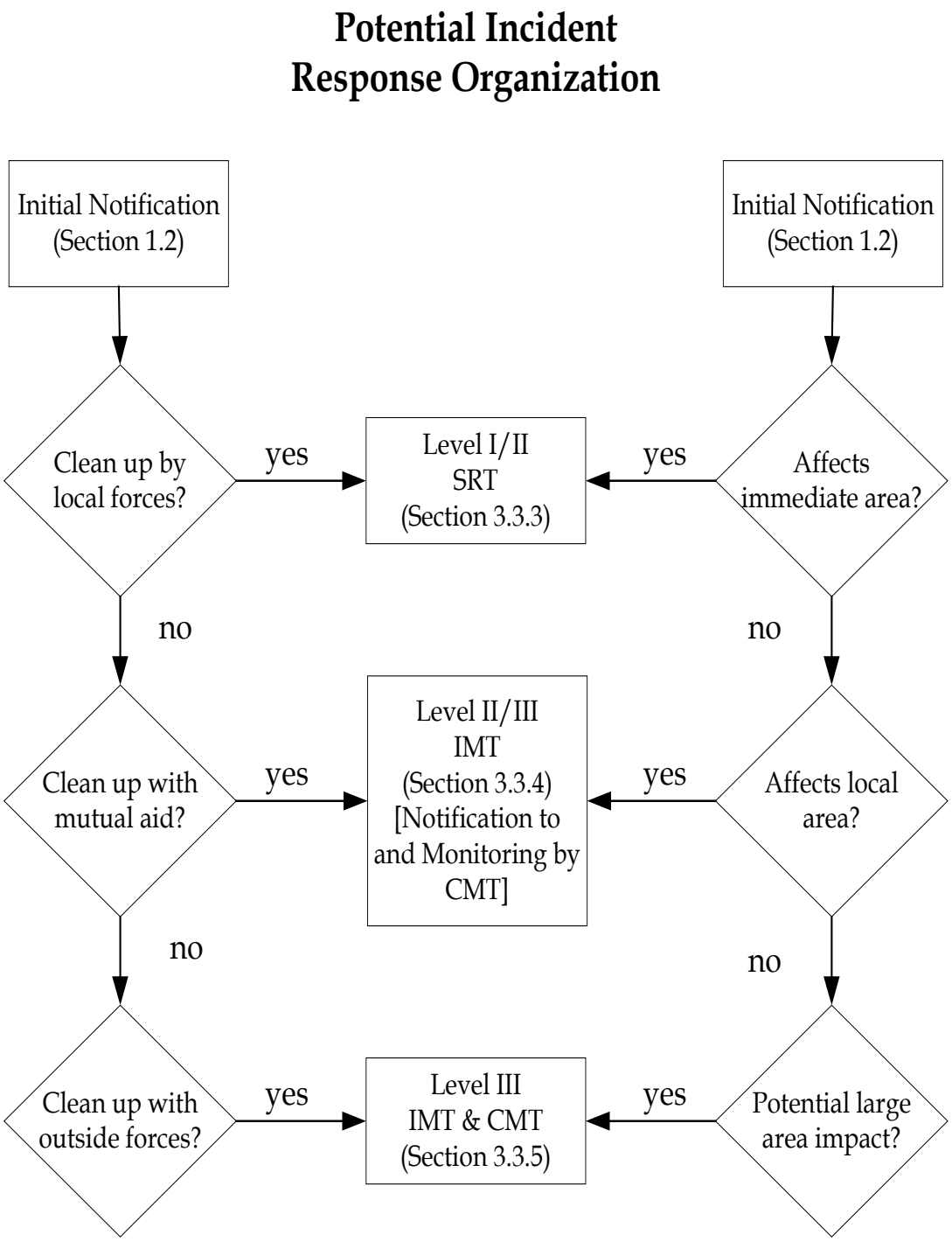
Figure 3.3-4 Decision Trees for Determining Appropriate Incident Response Organization



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3.4 REALISTIC MAXIMUM RESPONSE OPERATING LIMITATIONS

Cross-reference:

18 AAC 75.425(e)(3)(D)

Alaska Inland Area Contingency Plan

Arctic and Western Alaska Area Contingency Plan

ACS Technical Manual, Tactic L-7

3.4.1 General Adverse Weather Conditions

Environmental conditions can sometimes limit response work. Some limitations are based on safety and health, and others concern equipment effectiveness. Table 3.4-1 lists the percentage of time some variables may reduce effectiveness of response for planning purposes. In the event the realistic maximum response operating limitations are exceeded, the North Slope Energy's Drill Site Manager will make the decision whether to shut down or to continue operations. In order to make this decision the Drill Site Manager will receive information from a number of sources (e.g., NOAA weather forecasts and ConocoPhillips Alaska, Inc.'s, [CPAI's] weather and operations centers). The Drill Site Manager will use this information in conjunction with knowledge of current drilling operations (e.g., fuel status, drilling schedule, and other determining factors) to determine if continued operations may limit response work and response time to a spill at the drill pad in the event of an occurrence.

The single-most limiting factor of mechanical containment and response effectiveness at the drill site is extreme winter conditions. In the event such conditions occur, activities at the drill site may be curtailed because of safety and health considerations. Temperatures below –35 °F may cause failures in hydraulic and cable equipment, and below –40 ºF vacuum trucks may fail. Winds above 15 knots with 30-knot gusts are strong enough to make hoists and lifts unsafe, and whiteouts restrict visibility to a few feet, 10 to 20 ft above the ground. Drill site activity may also be curtailed if crucial materials or supplies cannot be delivered because of flight delays or cancellations caused by weather conditions.

Any drill rig operation during Phases 1, 2, or 3 weather conditions (see below) is considered a non-standard operation. All non-standard operations require a pre-job safety and health meeting in which hazards are assessed with appropriate personnel. A risk assessment is performed on those hazards and appropriate mitigation measures are identified to manage the hazards. If the risk assessment indicates that the hazards cannot be appropriately managed, then the rig will be shut down until weather conditions improve.

The Drill Site Manager would lead the risk assessment with the participation of other appropriate drilling personnel. The Drill Site Manager would be responsible for making the final decision on the rig as to the level of risk and will consider the following (and information in Sections 3.4.2 through 3.4.5):

- Forecast for weather conditions: duration, area, severity, crew change-out
- Safety and health of operation: type of operation, hazards, and risks involved
- Fuel and water levels to sustain operation
- Support personnel: trucking companies, mud companies, tool services
- Availability of emergency equipment and medical facilities proximity

Phase 1, 2, or 3 weather conditions are described below:

- **Phase 1 Caution** – Reduced visibility. Travel in the field is permitted using extreme caution. Reduce speed and be certain all equipment (e.g., radio, lights) is operating properly, arctic gear is required.
- **Phase 2 Restricted** – Convoy-only travel in the field. Travel is permitted in convoys of two or more vehicles only. Radio communication between vehicles in the convoy is required.
- **Phase 3 Closed** – Critical or emergency travel only. Travel will be by heavy equipment convoy only.

Table 3.4-1
Weather Conditions that Could Reduce the Effectiveness of a Mechanical Response

Operating Limit	Winter November 1 to May 15		
	Percentage	Average Occurrence Each Winter	Average Duration
Daily Mean Temperature -35 ˚F[1]	6 %	5.6 %	1.4 days
Daily Mean Winds ≥15 knots[1]	22 %	32%	3.3 days
Daily Mean Visibility <1 mile[1]	<3 %	3.7 %	1.2 days
Daily Mean Windchill[1]	37 %	12.3 %	3.3 days

[1] Based upon 2004 to 2007 Deadhorse records obtained from the National Oceanic and Atmospheric Administration's Global Summary of the Day web page: https://www.ncdc.noaa.gov/
˚F = degrees Fahrenheit

3.4.2 Snow, Ice, and Debris

The visibility with light snow is greater than a half mile; moderate snow is greater than a quarter-mile but less than a half-mile; and heavy snow yields a visibility of less than a quarter mile. Drifting snow may impede road and trail access. Floating or wind-borne debris is not likely to present significant interference with onshore response operations.

3.4.3 Hours of Daylight

The winter season above 69°N latitude has a period without sunrise for more than 60 days from late November to late January. During periods of darkness, twilight averages about 3 hours per day. By mid-February, the period between sunrise and sunset has increased to more than 7 hours. After mid-March, the days reach 12 hours and extend to 24 hours by early May. Options to increase visibility in darkness would include use of portable lights and infrared camera.

3.4.4 Miscellaneous

In general, less ice accumulates on an aircraft's frame when more ice particles than liquid droplets are present. Ice particles tend to bounce off an aircraft surface, while the supercooled droplets freeze and adhere. As a result, ice accumulation is often greatest at temperatures not too far below 32 °F, where liquid water content can be abundant, and is usually negligible at temperatures below about -4 °F.

Based on Deadhorse Airport records, flight restrictions due to extreme weather during the months of December through July make up 1.67 percent to 2.03 percent of flight delays.

3.5 LOGISTICAL SUPPORT

Cross-reference:

18 AAC 75.425(e)(3)(E)

Alaska Inland Area Contingency Plan

Arctic and Western Alaska Area Contingency Plan

ACS Technical Manual, Tactics L-4 and L-6

The Logistics Section Chief is responsible for providing facilities, transportation, communications, services, and material in support of the incident. The Logistics Services Branch may include communications, information technology, medical, and food units. Similarly, the Support Branch may entail transportation, personnel, equipment, facilities, and supplies.

Logistical support for spill response is provided through response contractors with support, as needed, from the North Slope Energy offices in Anchorage, Alaska. Vendors in Alaska that may be called upon to support spill response operations are listed in Table 3.5-1. For North Slope operations, ACS provides most, if not all, of the needed support through existing resources and its subcontractor base. Sources for air transportation, ground transportation, air-cushioned vehicles, and vessels are listed in Table 3.5-1.

Depending on the severity of a situation, federal/state logistics functions may also support the response. Examples of these functions include ordering, tracking, and servicing government resources, arranging for transportation and lodging for government response staff, providing communications to government oversight staff (field monitors), and performing other logistics-related functions specifically in support of the government oversight role. These governmental functions may become an integral part of the overall Logistics Section should North Slope Energy establish a Mutual Aid Agreement with government agencies during a response.

3.5.1 Ground Transportation

Ground transportation will provide the primary transport mode during winter exploration activities. Sites may be reached via established roads or snow/ice roads using trucks, Rolligons, and tracked vehicles, as required. These vehicles are available through North Slope Energy's support contractors and ACS. Access routes to exploration sites are illustrated in the site-specific addenda.

3.5.2 Air Transportation

Personnel and equipment may also be mobilized and transported to a site via air support. ACS maintains service agreements with commercial providers for air transportation, including fixed-wing and helicopter operations. Additional support is available from commercial aviation companies in Alaska. Airstrips and their relation to the exploration drill sites, if applicable, are illustrated in the site-specific addenda.

Table 3.5-1
Logistical Support Vendors

Company	Service	Contact
Transportation		
Northern Air Cargo 3900 Old International Airport Road Anchorage, AK 99502	Charter and scheduled air cargo DC-6 and 737	(800) 727-2141 (907) 243-3331
Alaska Airlines, Inc. PO Box 68900 Seattle, WA 98168	Passenger and freight service 737-200 passenger/cargo aircraft	(800) 225-2752 (cargo center)
Lynden Transport 3027 Rampart Drive Anchorage, AK 99501	Overland freight services	Anchorage Terminal Department (907) 276-4800
Lynden Air Cargo 6441 S. Airpark Place Anchorage, AK 99502	Charter – charter cargo aircraft L-382 Hercules (C-130) aircraft	(888) 243-7248 (907) 257-5124
Everts Air Cargo 6111 Lockheed Avenue Anchorage, AK 99502	Charter – cargo and fuel aircraft DC-6 and C-46 cargo aircraft	(866) 242-0003 (907) 243-0009
Evergreen Helicopters of Alaska 1936 Merrill Field Drive Anchorage, AK 99501	Helicopter and fixed-wing contract and charter services	(800) 958-2454 (907) 257-1500
Peninsula Airways, Inc. 6100 Boeing Ave., Suite 300 Anchorage, AK 99502	Response Air Charter Service	(907) 771-2664
Communications		
ProComm Alaska 2100 East 63rd Ave. Anchorage, AK 99507	Sales, service and administration, telecommunications, cable, data and radio frequency, mobile and transportable radio, and microwave and satellite systems	(907) 563-1176 (24 hours)
Surveyor's Exchange 3695 Springer Street Anchorage, AK 99503	Satellite telephones and two-way radios	(907) 561-6501 ext. 4 (800) 770-5500 ext. 4 (within Alaska only)
North Slope Telecom 2020 E. Dowling Road, Suite. 3 Anchorage, AK 99507	VHF/UHF portable radios	(907) 751-8200
GCI 3120 Denali Street, Suite 5 Anchorage, AK 99503	Wireless, internet, telephone, video	(907) 265-5454 (800) 800-4800
ASTAC 4300 B St. Suite 501 Anchorage, AK 99503	Cell telephones, wireless, broadband	(907) 563-3989 (800) 478-6409

Table 3.5-1
Logistical Support Vendors

Medical Services		
Beacon 701 East Tudor Road Anchorage, AK 99503	Remote medical technicians	(907) 222-7612
Fairweather LLC 301 Calista Court Anchorage, AK 99518	Emergency medical technicians, paramedic service, and physician assistants (PAs)	(907) 346-3247
Facilities and Logistical Support		
Global Services, Inc. 1701 E. 84th Ave. Anchorage, AK 99507	Catering and housekeeping and portable camps	(907) 349-3342
Doyon Universal Services 11500 C Street, Suite 100 Anchorage, AK 99515	Catering services	(907) 522-1300
Bering Marine Corporation (Lynden company) 6520 Kulis Drive Anchorage, AK 99502	Barge camps and modular camps	800) 922-7501 (907) 248-7646
ESS Support Services 201 Post Road Anchorage, AK 99501	Logistics, professional catering, and modular camp facilities	(907) 344-1207
HDT Global 6811 E. Mission Avenue Spokane, WA 99212	Pillow tanks, fuel bladders, and containment systems	(800) 969-8527 (509) 624-8921
Polar Supply, Inc. 300 E. 54th Avenue, Anchorage, AK 99518-1230	Secondary containment liner, portable dikes	(907) 563-5000
Aqua Dam, Inc. 121 Main Street, Suite A PO Box 144 Scotia, CA 95565	Water Structures Unlimited, portable dikes	(800) 682-9283
Kuukpik Arctic Catering 1301 Huffman Road, Suite 206 Anchorage, AK 99515	Remote Camp and Catering Specialist	(907) 562-5588

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3.6 RESPONSE EQUIPMENT

Cross-reference:
18 AAC 75.425(e)(3)(F)

ACS Technical Manual

3.6.1 Equipment Lists

Spill response equipment is available through ACS. Table 3.6-1 identifies typical on-site response equipment to be kept at the drill site. Specific types of mechanical response equipment are maintained in a heated storage unit to ensure operability during the winter drilling season. The decontamination conex is furnished with a heater that would be activated when the unit is in operation. Additional on-site equipment available for spill response is listed in the site-specific addenda.

3.6.2 Maintenance and Inspection of Response Equipment

Response equipment will be maintained in such a manner that it can be deployed rapidly and in a condition for immediate use. The on-site response equipment will be routinely inspected and tested. ACS performs routine inspection and maintenance of all drill site response equipment.

ACS holds the following USCG Oil Spill Removal Organization (OSRO) classifications:

- MMPD (Maximum Most Probable Discharge) classification for facilities and vessels operating in inland, nearshore, and river or canal environments
- WCD1 (Worst Case Discharge Tier 1) classification for facilities and vessels operating in inland, nearshore, and river or canal environments
- WCD2 (Worst Case Discharge Tier 2) for facilities and vessels operating in river or canal environments

ACS complies with the equipment maintenance and testing criteria that these classifications require.

Table 3.6-1
Typical On-Site Response Equipment

Category	Description
General Safety	
	Boots, Xtratuff
	Booties
	Gloves (chemically resistant, cotton, PVC cold weather)
	Goggles
	Rain suites
	Small first aid kit
	Traffic cone
	Tyvek® suits, XXX-large
Containment	
	Bags, oily waste (100 per case)
	Sled
	Sorbent boom, 8 inch x 10 feet (40 feet per bag)
	Sorbent pads, 18 inch x 18 inch (white)
	Sorbent pads, 18 inch x 18 inch (yellow)
	Sorbent roll, 36 inch x 150 feet
	Visqueen plastic, 20 feet X 100 feet
Recovery	
	Diesel generator, 6kW
	Hose, discharge, 3-inch
	Hose, suction hose, 3-inch
	Pump, diaphragm, 3-inch
	Pump, trash, 3-inch
	Push broom
	Weed burner, propane

Table 3.6-1
Typical On-Site Response Equipment

Category	Description
Tools	
	Current kit/package inventory
	Extension cord, 50 feet
	Flashlight, battery
	Fuel can, diesel, 5-gallons
	Ice chipper
	Floor squeege, 24-inch
	Parachute cord, nylon, 200 feet
	Pitch fork
	Rope, polyethylene, ¼-inch X100 feet
	Sledge hammer, 8 lb
	Shop stool, swivel
	Shovel, round, long handle
	Shovel, snow, aluminum scoop, long handle
	Shovel, square, long handle
	Spring clamp, 2-inch
	Stencils, brass, 45 piece set
	Survey stakes, 50 per bundle
	Tape, duct, 2-inch
	Tape, orange flagging, 100 feet
	Tie Wire, 100 feet
	Tool box with assorted small hand tools
	Tripod light system
	Utility knife

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3.7 NON-MECHANICAL RESPONSE OPTIONS

Cross-reference:
18 AAC 75.425(e)(3)(G)

North Slope Energy does not propose to utilize ISB or chemical dispersants as a response option.

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3.8 RESPONSE CONTRACTOR INFORMATION

Cross-reference:
18 AAC 75.425(e)(3)(H)

ACS Technical Manual

3.8.1 Response Contractors

In addition to on-site personnel, North Slope Energy maintains an oil spill response service contract with ACS as a primary response action contractor. North Slope Energy also maintains a response action contract with Witt O'Brien's, LLC to support the IMT and fulfill the specialized roles of Section Chief and unit function within the IMT. If additional resources are required, they will be accessed through Master Services Agreements maintained by North Slope Energy and ACS.

North Slope Energy's Statements of Contractual Terms (SOCT) with ACS and the Witt O'Brien's, LLC are provided in Attachment 3.8-1 and Attachment 3.8-2, respectively.

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Attachment 3.8-1
Statement of Contractual Terms – Alaska Clean Seas

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STATEMENT OF CONTRACTUAL TERMS

(PLEASE COMPLETE BOTH SIDES)

AS REQUIRED UNDER AS 46.04.30, AS 46.04.035 and 18 AAC 75.445(i)(1) in fulfillment of a requirement for registration of primary response action contractors and for approval of an Oil Discharge Prevention and Contingency Plan.

PLAN TITLE: West Inigok Area Exploration Program,

PLAN HOLDER: North Slope Energy, LLC,

This statement is a certification to the Alaska Department of Environmental Conservation summarizing the contract between North Slope Energy, LLC, the oil discharge prevention and contingency plan holder (hereafter "PLAN HOLDER"), and Alaska Clean Seas, the oil spill primary response action contractor or a holder of an approved oil discharge prevention and contingency plan under contract (hereafter "CONTRACTOR"), executed on _____, and the original of which is located at 3300 C Street, Suite 200, Anchorage, AK 99503, as evidence of the PLAN HOLDER's access to the containment, control and/or cleanup resources required under standards at AS 46.04.030 and 18 AAC 75.400 -- 18 AAC 75.495. The PLAN HOLDER and the CONTRACTOR attest to the Department that the provisions of this written contract clearly obligate the CONTRACTOR to:

(A) provide the response services and equipment listed for the CONTRACTOR in the contingency plan;

(B) respond if a discharge occurs;

(C) notify the PLAN HOLDER immediately if the CONTRACTOR cannot carry out the response actions specified in this contract or the contingency plan;

(D) give written notice at least 30 days before terminating this contract with the PLAN HOLDER;

(E) respond to a Department-conducted discharge exercise required of the PLAN HOLDER; and

(F) continuously maintain in a state of readiness, in accordance with industry standards, the equipment and other spill response resources to be provided by the CONTRACTOR under the contingency plan.

2

STATEMENT OF CONTRACTUAL TERMS

I hereby certify that, as representative of the PLAN HOLDER, I have the authority to legally bind the PLAN HOLDER in this matter. I am aware that false statements, representations, or certifications may be punishable as civil or criminal violations of law.

_____
Signature Date

Name:_____

Title: _____

FOR: North Slope Energy, LLC
PLAN HOLDER

I hereby certify that, as representative of the CONTRACTOR, I have the authority to legally bind the CONTRACTOR in this matter. I am aware that false statements, representations, or certifications may be punishable as civil or criminal violations of law.

_____
Signature Date

Name:_____

Title: _____

For: Alaska Clean Seas
CONTRACTOR

Attachment 3.8-2 Statement of Contractual Terms – Witt O'Brien's, LLC

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STATEMENT OF CONTRACTUAL TERMS

(PLEASE COMPLETE BOTH SIDES)

AS REQUIRED UNDER AS 46.04.30, AS 46.04.035 and 18 AAC 75.445(i)(1) in fulfillment of a requirement for registration of primary response action contractors and for approval of an Oil Discharge Prevention and Contingency Plan.

PLAN TITLE: West Inigok Area Exploration Program,

PLAN HOLDER: North Slope Energy, LLC,

This statement is a certification to the Alaska Department of Environmental Conservation summarizing the contract between North Slope Energy, LLC, the oil discharge prevention and contingency plan holder (hereafter "PLAN HOLDER"), and Will O'Brien's, LLC, the oil spill primary response action contractor or a holder of an approved oil discharge prevention and contingency plan under contract (hereafter "CONTRACTOR"), executed on _____, and the original of which is located at _____, as evidence of the PLAN HOLDER's access to the containment, control and/or cleanup resources required under standards at AS 46.04.030 and 18 AAC 75.400 -- 18 AAC 75.495. The PLAN HOLDER and the CONTRACTOR attest to the Department that the provisions of this written contract clearly obligate the CONTRACTOR to:

(A) provide the response services and equipment listed for the CONTRACTOR in the contingency plan;

(B) respond if a discharge occurs;

(C) notify the PLAN HOLDER immediately if the CONTRACTOR cannot carry out the response actions specified in this contract or the contingency plan;

(D) give written notice at least 30 days before terminating this contract with the PLAN HOLDER;

(E) respond to a Department-conducted discharge exercise required of the PLAN HOLDER; and

(F) continuously maintain in a state of readiness, in accordance with industry standards, the equipment and other spill response resources to be provided by the CONTRACTOR under the contingency plan.

2

STATEMENT OF CONTRACTUAL TERMS

I hereby certify that, as representative of the PLAN HOLDER, I have the authority to legally bind the PLAN HOLDER in this matter. I am aware that false statements, representations, or certifications may be punishable as civil or criminal violations of law.

_____
Signature Date

Name:_____

Title: _____

FOR: North Slope Energy, LLC
PLAN HOLDER

I hereby certify that, as representative of the CONTRACTOR, I have the authority to legally bind the CONTRACTOR in this matter. I am aware that false statements, representations, or certifications may be punishable as civil or criminal violations of law.

_____
Signature Date

Name:_____

Title: _____

For: Willt O'Brien's, LLC
CONTRACTOR

3.9 TRAINING

Cross-reference:

18 AAC 75.425(e)(3)(I)

29 Code of Federal Regulations (CFR) 1910.120(q)

Alaska Inland Area Contingency Plan

Arctic and Western Alaska Area Contingency Plan

ACS Technical Manual, Tactic A-4

3.9.1 North Slope Energy Training Policies

Training for oil response personnel is required by two primary agencies: Occupational Safety and Health Administration (OSHA), and ADEC.

North Slope Energy employees and contractors will primarily serve in management positions in both the specific drilling operations and for a major spill response effort. Direct supervision of an actual response effort (including section chief roles) will be performed by highly trained personnel available from North Slope Energy staff, ACS, and Witt O'Brien's.

In their anticipated roles, North Slope Energy personnel and support contractors will focus primarily on environmental compliance, pollution prevention, safety and health oversight, documentation, and financial/legal oversight. Accordingly, North Slope Energy training efforts will focus on these aspects of the response. ACS will supervise the primary response actions. ACS's training programs already focus on these critical areas.

Operations and maintenance training will be performed primarily by the drilling contractor. The drilling contractor's toolpusher is responsible for training personnel in the proper methods of equipment and facility maintenance and repair. The drilling foreman also participates in on-site well control drills, BOP tests, and spill prevention procedures that are performed by drilling contractor personnel.

3.9.2 North Slope Energy Spill Response Training

All persons involved in spill response shall be trained in the requirements of this plan.

Key North Slope Energy personnel involved in the ICS will be involved in the following specific training activities:

- Regulatory compliance training including familiarization with the ODPCP requirements and other regulatory requirements at the start of each operation (such as drilling at a new location)
- Annual training on corporate safety, health, and environmental policy and procedure
- ICS training including spill drills, exercises, and deployments
- Other specialized training which may be offered under the ACS ongoing training program.

Key North Slope Energy personnel and consultants currently have considerable training or equivalent experience necessary to perform their assigned positions in the ICS structure (see Section 3.3, Command System). All new training for North Slope Energy personnel will be recorded and maintained for a minimum of five years at the corporate office.

3.9.3 Response Personnel Training

ACS's emergency spill response technicians are required per 29 CFR 1910.120(q) for each team member to have initial emergency response training and annual refresher training, which meets or exceeds the HAZWOPER requirements. Annual requirements for HAZWOPER refreshers, medical physicals, and respirator fit-tests are tracked by ACS through regular reports from the database.

The training program consists of regular classes, which emphasize hands-on experience, field exercises, and team-building drills. The program is developed by the ACS Lead Technician in conjunction with North Slope Energy management and may utilize external training consultants. Table 3.9-1 lists typical SRT training courses.

3.9.4 Training Records

Prevention training records for all North Slope Energy personnel engaged in the inspection, maintenance, or operation of oil storage and transfer equipment are kept on file at the project drill site and the North Slope Energy's corporate office.

ACS maintains oil spill training records of all ACS SRT personnel, both employees and contractors. Training attendance records for SRT members are filed in the ACS office. Training records of other North Slope Energy employees, including IMT members, are maintained at the North Slope Energy's corporate office. Table 3.9-1 lists basic training courses. Skilled technicians and team leaders receive specialized response training based upon job responsibilities.

Table 3.9-1
Spill Response Technician Training Courses

North Slope Training Cooperative (8 hours)
Field Environmental Handbook
Alaska Safety Handbook
North Slope Visitor's Guide
Hazardous Waste Operations (24- or 40-hour level dependent upon labor category)
Incident Command System (basic overview)
Contractor's Health, Safety, and Environment Plan (as required)
Oil Spill Discharge Prevention and Contingency Plan Training Course

3.9.5 Exercises

External exercises involve efforts outside of North Slope Energy to test the interactions between North Slope Energy and the UC, including state, federal, local agencies, and local community representatives. The external exercises also test the plan and coordination between North Slope Energy, ACS, Witt O'Brien's, and support contractors.

External exercises include area exercises and government-initiated unannounced exercises. North Slope Energy will conduct an annual response exercise before or during seasonal drilling operations in a given year, which satisfies the requirement of an area exercise. If seasonal drilling operations are not scheduled for a specific year, then the annual exercise would be deferred until the next season of actual operations. Federal, state, and local agencies will be invited to participate in the development and evaluation of the drill. The annual exercise satisfies the National Preparedness for Response Exercise Program requirements to exercise all aspects of the response plan at least every three years. The following are the components that are tested through the exercise:

Organizational Design

- Notifications (includes training on 24-hour notifications and reporting to the NRC)
- Staff mobilization
- Effective operation within the response management system described in the plan

Operational Response

- Discharge control
- Assessment of discharge
- Containment of discharge
- Recovery of spilled material
- Protection of economically and environmentally sensitive areas
- Disposal of recovered product

Response Support

- Communications
- Transportation
- Personnel support
- Equipment maintenance and support
- Procurement
- Documentation

3.9.6 IMT Member Training

The North Slope Energy IMT will be exercised during active drilling operations through tabletop and field drills, followed by debriefing sessions. When additional training or response procedures are identified, training programs or workshops are designed to address the identified issue.

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3.10 ENVIRONMENTAL PROTECTION

Cross-reference:

18 AAC 75.425(e)(3)(J)

ACS Technical Manual, Tactics W-1 through W-6

Alaska Inland Area Contingency Plan

Arctic and Western Alaska Area Contingency Plan

Alaska Historic Preservation Act (Alaska Statutes [AS] 41.35.200)

Wildlife Protection Guidelines for Alaska

3.10.1 Seasonal and Physical Constraints

Specific sensitivities, priorities, and response strategies for the North Slope region are referenced in the Sensitive Areas Sections of the Alaska Inland Area Contingency Plan and Arctic and Western Alaska Area Contingency Plan. Priorities for protection would be set in consultation with ADEC and natural resource trustees through the UC.

The best source of information on sensitive areas and resources at risk during an incident would be the natural resource managers working with the Arctic coastal plain ecosystems and local resources. These sources provide local experience and expertise, as well as the most current information regarding sensitive sites. ADF&G, ADNR, USFWS, and other wildlife trustee agencies can provide a wealth of local wildlife and habitat information (see Section 1.2, Reporting and Notification, for contact information).

Exploratory drilling will be conducted only during winter conditions; therefore, there is a reduced risk to sensitive areas and resources as these are covered in snow and ice.

3.10.2 Seasonality and Toxicity Effects

The exploratory wells covered under this plan are for oil and gas. Crude oil has a potentially wide range of physical and toxicological characteristics; however, because drilling operations are only planned for winter conditions, there is little threat of toxicity to biota and the primary concern would be for health and safety. An MSDS would be maintained at the project drill site which summarizes the crude oil characteristics and potential toxicity effects.

3.10.3 Sensitive Resources and Priorities

The resources at risk in the North Slope region vary significantly from inland to coastal settings. However, given the seasonal dynamics of winter exploration, the cover of snow and ice provides a level of protection for the surrounding habitat. Sensitive sites and resources specific to each of the proposed exploration sites are shown in the corresponding site-specific addenda, and the procedure for determining priorities is in Section 1.6.4.

3.10.4 Wildlife Response Services

The ARRT Wildlife Protection Guidelines for Alaska describe response strategies to protect wildlife during an oil spill. These strategies are prioritized into primary, secondary, and tertiary.

The primary response strategy emphasizes controlling the release and spread of spilled oil at the source to prevent or reduce contamination of potentially affected species and/or their habitat. For this reason, exploration activities are conducted only during winter conditions. Should a discharge occur during exploration, protection strategies would include ice and snow berms and measures to control the discharge at its source and to limit the spread of oil on ice and snow. Possible protection and containment countermeasures are detailed in the ACS Technical Manual, Tactics C-1, C-4 and C-19, and W-1 through W-6.

In addition, the primary response strategy includes removal of oiled debris, particularly contaminated food sources (such as dead wildlife carcasses) both in water and on land. Permit forms for collection and storage will be completed and submitted to the appropriate agencies for approval prior to undertaking these activities.

The secondary response strategy emphasizes keeping potentially affected wildlife away from oiled areas through the use of deterrent techniques. Tactics may include visual methods such as ribbons and balloons, auditory methods (poppers and air cannons), a combination of both, and other methods.

The tertiary response strategy, which is a last-resort strategy, addresses the potential capture and treatment of oiled wildlife. Typically, only a small percentage of oiled wildlife that are highly sensitive to the effects of oiling can be captured. Of those, only a portion will survive the treatment process.

3.10.5 Trustee Agencies, Notification/Approval Procedures, Permits

Both secondary and tertiary wildlife protection strategies require approval of an action plan and special permits from the appropriate wildlife agencies and the FOSC. Action item checklists for requesting authorization to initiate secondary and/or tertiary wildlife response activities (required prior to any hazing, collection, or holding of wildlife) are included in the Wildlife Protection Guidelines for Alaska. Agencies from which permits are required for wildlife intervention activities are shown in Table 3.10-1.

Response activities will be conducted in a manner that minimizes adverse effects to wildlife. The Wildlife Protection Guidelines for Alaska contain general suggestions to minimize adverse effects to wildlife from response activities. The precise techniques will need to be identified on an incident-specific basis.

Table 3.10-1
State and Federal Permits and/or Authorizations Required for Collecting, Hazing/Deterring, or Holding Live Animals

Activity	Migratory Birds	Sea otters, walruses	Whales, porpoises, dolphins, seals, and sea lions	Terrestrial mammals, furbearers, and non-migratory birds	Fish, shellfish, and invertebrates	Bald or golden eagles	Threatened or endangered species
Carcass Collection	USFWS Migratory Bird Salvage Permit & OLE Authorization[2]	USFWS Permit & OLE Authorization[2]	NMFS MMHSRP Permit[3]	ADF&G Wildlife Response Permit	ADF&G Aquatic Resource Permit	USFWS Permit & OLE Authorization[2]	NMFS/USFWS ESA Section 7 consultation[4] & USFWS OLE Authorization[2]
Haze/Deter	ADF&G Wildlife Response Permit	USFWS MMPA Section 112(c) LOA	NMFS MMHSRP Permit[3]	ADF&G Wildlife Response Permit	N/A	USFWS Eagle Depredation Permit	NMFS/USFWS ESA Section 7 consultation[4]
Capture, Transport, Stabilize, or Rehabilitate	USFWS Migratory Bird Rehab Permit	USFWS MMPA Section 112(c) LOA	NMFS MMHSRP Permit[3]	ADF&G Wildlife Response Permit	N/A	USFWS Eagle Depredation Permit	NMFS/USFWS ESA Section 7 consultation[4]
Source from Section 4820.1 of the ARRT Wildlife Protection Guidelines for Alaska. Endangered and threatened species are listed in Sections 9740.2.1, 9740.2.2 and 9740.2.3 of the Alaska Regional Response Team Wildlife Protection Guidelines. Check at the time of the spill for current listing.							

ADF&G = Alaska Department of Fish and Game
EPA = U.S. Environmental Protection Agency
ESA = Endangered Species Act
OA = Letter of Authorization
MMPA = Marine Mammal Protection Act
MMHSRP = Marine Mammal Health and Stranding Response Program
NMFS = National Marine Fisheries Service
OLE = Office of Law Enforcement
USCG = U.S. Coast Guard
USFWS = U.S. Fish and Wildlife Service

Table Notes:
1. An ADF&G permit is required to deter, collect, or hold any species on the state endangered species list that is not on the federal endangered species list.
2. For species managed by USFWS (e.g., migratory birds, sea otters, walruses, and polar bears).
3. Request verbal case-by-case authorization from the NMFS Regional Stranding Program Coordinator or associated co-investigator.
4. ESA Section 7 consultation between federal action agencies (e.g., USCG or EPA) and consulting agencies (USFWS and NMFS).

3.10.6 Cultural Resources

Historic and prehistoric archaeological resources include a wide range of sites, deposits, structures, ruins, buildings, graves, artifacts, fossils, and other objects of antiquity. Per Alaska Statute (AS) 41.35.200, it is unlawful to collect or disturb, remove, or destroy any historic property.

If historic properties are discovered or suspected, they are not under any circumstances to be disturbed. Historic properties must be immediately reported to the On-scene Coordinator and to ADNR, Division of Parks and Outdoor Recreation, Office of History and Archaeology, who will determine the appropriate action to be taken (telephone 907-269-8700).

Additional information on historic properties protection during incident response may be found at the following internet addresses:

- http://www.achp.gov/index.html (Programmatic Agreement on Protection of Historic Properties during Emergency Response under the National Oil and Hazardous Substances Pollution Contingency Plan)
- http://www.akrrt.org (Alaska Implementation Guidelines for Federal On-scene Coordinators for the Programmatic Agreement on Protection of Historic Properties during Emergency Response under the National Oil and Hazardous Substances Pollution Contingency Plan). For historic properties protection, refer to Section 4870 in the Alaska Inland Area Contingency Plan and Arctic and Western Alaska Area Contingency Plan.

3.10.7 Land Resources

A Land Use Permit is required from the ADNR for cleanup activities occurring on state lands that extend beyond what is considered "generally allowed uses" (https://dnr.alaska.gov/mlw/forms/). Invasive activities with machinery or travel across tundra require permits.

Within the NPR-A, notification to the BLM would be required to request permission for cleanup activities (refer to Table 1.2-2 for contact information).

3.11 ADDITIONAL INFORMATION

Cross-reference:

18 AAC 75.425(e)(3)(K)

Alaska Inland Area Contingency Plan

Arctic and Western Alaska Area Contingency Plan

Wildlife Protection Guidelines for Alaska

ACS Technical Manual, Tactic A-3

3.11.1 Permit Forms

The following forms may be found in the Wildlife Protection Guidelines for Alaska:

- Oil Spill Response Checklist: Wildlife Hazing
- Oil Spill Response Checklist: Wildlife Capture, Transportation, Stabilization, and Treatment
- Data Sheet for Collected Live, Oiled Wildlife
- Data Sheet for Collected Dead, Oiled Wildlife

ACS maintains pre-approved permits for emergency use. These permits include:

- Nationwide Oil Spill Cleanup Agreement
- Land Use for Oil Spill Emergency
- Title 16 Fish Habitat Permits
- Bird Hazing
- Mammal Hazing, Stabilization, Transport and Disposal
- Capture, Salvage and Rehabilitation of Migratory Birds and Raptors
- Authorization to Discharge Pollutants in Stormwater
- Access to Alaska Heritage Resources Survey Information

3.11.2 ICS Forms

The following is a list of ICS forms used for response along with the individual responsible for preparation.

ICS FORM NO.	DESCRIPTION	PREPARED BY
200	Incident Action Plan (IAP)	Situation Unit Leader
201	Initial Incident Briefing, Flow Diagram	On-scene Commander
201-1	Initial Incident Briefing, Incident Map	Field Aide
201-2	Initial Incident Briefing, Summary of Incident and current Action	Field Aide
201-3	Initial Incident Briefing, Tactical Response Team	Field Aide
201-4	Initial Incident Briefing, Resource Summary	Staging Area Manager
201-5	Initial Incident Briefing, Site Safety, Health, and Controls	Incident Management Team (IMT) Site Safety and Health Officer
202	Incident Objectives	Small Team
203	IMT Organization and Contact Chart	Resources Unit Leader
204	Field Assignment	Small Team
204C	Field Assignment Change Sheet	Small Team
204E	Field Assignment Environmental Message	Environmental Unit Leader
204S	Field Assignment Safety and Health Message	Safety and Health Officer
205	Incident Communications Plan (2 pages)	Communications Unit Leader
206	Medical Plan	Medical Unit Leader
209	Situation Status Summary	Situation Unit Leader
213	General Message	Any Message Originator
214	Unit Log	All Positions
215	Operational Planning Summary	Operations Section Chief and Planning Section Chief
219	Field Resource Status	Resource Unit Leader
220	Air Operations Plan	Air Operations Manager
222	Resource Order Form	Resource Unit Leader
224	Environmental Unit Summary	Environmental Unit Leader

3.12 BIBLIOGRAPHY

Cross-reference:
18 AAC 75.425(e)(3)(L)

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4.0 BEST AVAILABLE TECHNOLOGY REVIEW

Cross-reference:

18 AAC 75.425(e)(4)

This section discusses the BAT requirements contained in 18 AAC 75.425(e)(4)(A), (B), and (C) to address technologies not subject to response planning standards or performance standards in 18 AAC 75.445(k)(1) and (2). The discussion of each technology covers the requirement to analyze applicable technologies and to provide a justification that the technology used is BAT.

4.1 COMMUNICATIONS [18 AAC 75.425(e)(1)(D)]

Cross-reference:

Section 1.4

Site-specific addenda

The communications system for use in a spill response at the drill sites is described in Section 1.4 of this plan and site-specific addenda (if different than the core plan).

4.2 SOURCE CONTROL [18 AAC 75.425(e)(1)(F)(i)]

Cross-reference:

Sections 1.6.3, 2.1.6, and 2.5

Source control procedures for purposes of this BAT analysis relate to loss of well control and failure of the piping and valves on the diesel tank.

4.2.1 Well Source Control

Loss of well control (i.e., a blowout) is discussed in Section 1.6.1 of this plan and in North Slope Energy's Blowout Contingency Plan which addresses possible methods of available well control, including surface-control measures, well capping, relief-well drilling, and blowout ignition.

North Slope Energy will use the services of Wild Well Control, if well control is not regained by conventional mechanical means. The two methods of regaining well control once an incident has escalated to an uncontrolled blowout are well capping and relief-well drilling. Historical evidence indicates that well capping has greater reliability and application for well control when compared to that of relief-well drilling. The rationale for acceptance of well capping as BAT is provided in the following discussion.

4.2.2 Well Capping

Well capping techniques are well developed and proven to be efficient and effective in regaining control of damaged wells. Significant improvements to well capping techniques and procedures have been developed by a variety of well control specialist companies throughout the world. North Slope Energy has the ability to mobilize the specialized personnel and equipment for well capping to North Slope locations within 48 hours.

Well capping is both compatible and feasible with all drilling operations as the technology is applied at the surface. It is well suited for use with all well types, including extended reach and horizontal wells, and for remote locations. Well capping techniques have been applied both on land and at offshore locations. Historically, the techniques have proven successful in regaining well control in shorter durations and preferred over the more time-consuming alternative of drilling a relief well. The US Department of the Interior, Bureau of Ocean Energy Management's (BOEM's) and the Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology's (SINTEF's) civil and environmental engineering data indicate that well capping technologies provide the shortest duration and most effective option for regaining well control, while minimizing environmental impacts once all other control measures have failed. This is seen in the more consistent application of well capping in response to well-control events and the correspondingly shorter durations to successfully regain well control, as compared to the few relief wells that have been attempted.

North Slope Energy maintains an operating agreement with Wild Well Control, an experienced well control specialist that will mobilize the personnel and equipment to assist in the intervention and resolution of any well control event. Other equipment necessary during the well capping operation is commonly available on the North Slope (e.g., bulldozers, cranes, pumps, block-and-tackle, large-diameter casing) can be made available within eight hours of the actual emergency.

Refer to Table 4.2-1 for BAT evaluation.

4.2.3 Relief Well

In the unlikely event it becomes necessary, North Slope Energy would develop provisions for drilling a relief well. Certain well control events cannot be effectively dealt with by mechanical methods. Relief wells are a preferred approach when attempting control in circumstances, which involve high-pressure, shallow gas, a compromised surface casing or surface-casing cement job, an underground blowout, or an inaccessible wellhead.

One of the first considerations in the event of a well blowout is the need for drilling a relief well, because of the lead time involved in moving a rig to a suitable surface location and drilling the relief well. Although preparations for a relief well may be one of the first actions taken, regaining control of the blowout by pumping mud or cement down the well to contain the spill, is typically much faster and preferred over drilling a relief well, and generally more successful. If surface-control measures fail, relief-well plans will be implemented, as provided in the North Slope Energy's Blowout Contingency Plan. North Slope Energy management will make their decisions in accordance with procedures contained in the well-control plan. Identification of surface location, equipment, and timing is dependent on the specific well site conditions.

Table 4.2-1
Best Available Technology Analysis: Well Blowout Source Control

BAT EVALUATION CRITERIA	EXISTING METHOD: Well Capping	ALTERNATIVE METHOD: Relief Well Drilling
AVAILABILITY: Whether technology is best in use in other similar situations or is available for use by applicant.	Well capping is in use globally. Fit-for-purpose well capping and well-control equipment can be mobilized to on the North Slope within 72 hours as required. Additional equipment on the North Slope can be on location within 48 hours.	Relief-well drilling equipment (rigs, down-hole tools, etc.) is available, though not widely utilized.
TRANSFERABILITY: Whether each technology is transferable to applicant's operations.	Equipment is currently available via Wild Well Controls contract or on the North Slope.	Multiple drill rigs are currently under North Slope operator contracts. In accordance with standard industry, other operators would commit the necessary rigs and resources to combat a well-control incident.
EFFECTIVENESS: Whether there is a reasonable expectation each technology will provide increased spill prevention or other environmental benefits.	Numerous global companies provide successful applications of well capping. After natural bridging (54%) and conventional methods (blowout preventer, mud, cementing, equipment repairs, etc.) (30%), well capping (14%) is most frequent blowout control measure. Application of well capping provides best opportunity for minimizing pollution impacts. Estimated durations for well capping are 10 to 18 days for an unignited event and 10 to 30 days for an ignited event. (North Star 2011)	Rare successful application of relief-well drilling has been documented in industry. Industry data suggest a very small percentage (<5%) of blowouts are successfully controlled with this technique. Relief-well drilling at 60 to 90 days is the longest pollution mitigation measure possible. Relief wells may be preferred response method in some well-control events (shallow gas, compromised surface casing or surface-casing cementing, broaching, etc.), but these events are highly unlikely to result in the release of liquid hydrocarbons.
COST: The cost to applicant of achieving best available technologies, including consideration of that cost relative to the remaining years of service of the technology in use by the applicant.	Fit-for-purpose equipment is already owned or under long-term contract. Well capping requires the maintenance of open-end contracts with trained specialists to implement well-control/capping operations.	Time and cost of permitting, location of construction, well planning and executing relief wells is estimated at 2 to 3 times the cost of well capping, excluding any lost production.
AGE AND CONDITION: The age and condition of technology in use by the applicant.	Well capping technology has made improvements since its frequent application during the Iraq-Kuwait conflict in the early 1990s. Firefighting equipment is in place on the North Slope.	Relief-well drilling technology is similar to current methods used to drill/complete North Slope (NS) wells. Potentially sensitive to blowout well types (extended reach drilling [ERD]).
COMPATIBILITY: Whether each technology is compatible with existing operations and technologies in use by the applicant.	Technology is compatible and applied at surface (no sensitivity to well type).	Technology is compatible though potentially sensitive to blowout well types (ERD, remote locations, etc.). Survey uncertainty on high-departure wells may result in problems intersecting target wellbore.
FEASIBILITY: The practical feasibility of each technology in terms of engineering and other operational aspects.	Method is feasible with all drilling operations. Applied at surface – no sensitivities to well type (ERD, remote locations, etc.). Prior proven success in historical well-control efforts.	Method feasibility contingent upon geographical access near area of blowout. Lack of year-round access to some locations limit application. Very little evidence of successful application of relief-well drilling as the primary mitigation measure of control. Relief wells may be preferred response method in some well-control events (shallow gas, compromised surface casing or surface-casing cementing, broaching, etc.), but these events are highly unlikely to result in the release of liquid hydrocarbons.

Table 4.2-1
Best Available Technology Analysis: Well Blowout Source Control

BAT EVALUATION CRITERIA	EXISTING METHOD: Well Capping	ALTERNATIVE METHOD: Relief Well Drilling
ENVIRONMENTAL IMPACTS: Whether other environmental impacts of each technology, such as air, land, water pollution, and energy requirements, offset any anticipated environmental benefits.	Technology provides the best-proven opportunity to quickly reduce environmental impacts. Estimated duration of 18 to 30 days is significantly less than conventional alternative technologies.	Technology provides additional exposure and environmental risks during application (additional well-control problems). Technology application may be seasonally limited, leading to durations of 60 to 180 days. Relief wells may require additional gravel placement and mobilization or demobilization pressures on the local environment. Drilling a relief well is accompanied by the additional risk of a second well-control event.

A number of options may be available for location and equipment. Timing is dependent on the success of surface-control techniques and well conditions, including any natural bridging that may occur.

Relief-well drilling technology is compatible with North Slope drilling operations, although it may be sensitive to both the well location and the well type. Downhole and surface equipment (e.g., tubulars, wellheads) to support relief-well drilling operations are also available.

Relief-well drilling has been attempted only once to control a blowout on the North Slope. This was the Atlantic Richfield Company Cirque blowout in 1992. However, control was regained over the Cirque well before the relief-well reached target depth through a combination of well capping techniques and natural bridging.

An appropriate surface location is critical to relief well placement. If surface locations are not near the blowout, the relief-well methods can often face significant challenges (directional or extended-reach drilling) to reach the target formations in the blowout well. Optimally, a relief-well location will be positioned to minimize drilling time and complexity to reach the target formation. It must also provide a suitable working surface to position the relief-well rig and support drilling operations, and it must be sufficiently far away from the blowout plume and any associated explosion hazards. If a suitable location for a relief well set up is not available, it may necessitate the construction of gravel or ice pad to support operations, resulting in long lead times to initiate drilling and an overall increase in environmental impact.

Relief-well drilling is similar to current methods used to drill and complete North Slope wells, and advances in directional drilling technology allow for more precise wellbore placement. Relief-well success is dependent upon access to a suitable area near the blowout and directionally drilling to an intersection with the target zones. Because of the complicated logistics and access considerations, relief wells represent the longest duration alternative for effectively regaining well control.

In light of the above, North Slope Energy believes well capping constitutes BAT for the preferred well-source control technique. Historical evidence supports well capping as providing greater reliability and general application for well control compared to that of relief-well drilling. Additionally, the probable reduction in blowout duration, resulting from the well capping approach will result in a reduced discharge to the environment.

4.2.4 Oil Storage Tank Source Control

Portable fuel storage tank(s) associated with drill rigs are equipped with a manual shutoff valve(s), and the valve(s) are closed except during fuel transfers. Drilling operations are staffed 24 hours per day. BMPs (Section 2.1, Attachment 2.1-A) indicate two operators present in direct line-of-sight, and in constant communication for the duration of the fuel transfer, with one person having the ability to shut down the fuel transfer in the event of an emergency. North Slope Energy will only make use of temporary oil storage tanks during exploration drilling. Because this is not a permanently fixed facility, manual source control during fuel transfers is the most reliable, feasible, and cost-effective alternative of the three presented in Table 4.2-2.

Table 4.2-2
Best Available Technology Analysis: Oil Storage Tank Source Control

BAT EVALUATION CRITERIA	CURRENT METHOD: Manual Gate- or Ball-valve Closure	ALTERNATIVE 1: Automatic Ball-valve Closure	ALTERNATIVE 2: Automatic Gate Valve
AVAILABILITY: Whether technology is best in use in other similar situations or is available for use by applicant.	System is currently in use.	Technology exists to do this and is commonly used in pipeline systems.	Technology exists and is commonly used on pipeline systems.
TRANSFERABILITY: Whether each technology is transferable to applicant's operations.	System is currently in use.	This technology is transferable.	This technology is transferable.
EFFECTIVENESS: Whether there is a reasonable expectation that each technology will provide increased spill prevention or other environmental benefits	Effective because of ease of use, little maintenance, and work familiarity. Relies on strict administrative controls (procedures). Provides most reliable and efficient means of emergency shutdown.	A potentially effective means of preventing releases where operator error may occur. However, the ability to reliably control the valve is severely compromised in this application*. Concern may be that valve closes and filling hose ruptures.	A potentially effective means of preventing releases where operator error may occur. However, the ability to reliably control the valve is severely compromised in this application*. This technology would have a longer closure time than the ball valve.
COST: The cost to the applicant of achieving BAT, including consideration of that cost relative to the remaining years of service of the technology in use by the applicant.	No change in cost. System is currently in use.	Estimated installation cost of $20,000.	Estimated installation cost of $20,000.
AGE AND CONDITION: The age and condition of technology in use by the applicant	Old technology, age of equipment varies.	This would be a new installation with new equipment.	This would be a new installation with new equipment.
COMPATIBILITY: Whether each technology is compatible with existing operations and technologies in use by the applicant.	Compatible and widely used. Requires no change.	Could be made compatible with the existing system.	Could be made compatible with the existing system.
FEASIBILITY: The practical feasibility of each technology in terms of engineering and other operational aspects.	Feasible, easy to use and maintain.	Feasible to implement, but not as effective as a manual shutdown of transfer operations.	Feasible to implement, but not as effective as a manual shutdown of transfer operations.
ENVIRONMENTAL IMPACTS: Whether other environmental impacts of each technology, such as air, land, water pollution, and energy requirements offset any anticipated environmental benefits.	There are no environmental impacts that would offset any anticipated benefit.	There are no other environmental impacts that would offset any anticipated benefit.	There are no other environmental impacts that would offset any anticipated benefit.

*Note: Engineering Analysis of Automated Leak Detection/Liquid-level Measurement Devices.

4.3 TRAJECTORY ANALYSES [18 AAC 75 425(e)(1)(F)(iv)]

Not applicable. North Slope Energy's drill site operations are onshore.

4.4 WILDLIFE CAPTURE, TREATMENT, AND RELEASE PROGRAMS [18 AAC 75.425(e)(1)(F)(xi)]

Wildlife Protection Guidelines for Alaska describes the procedures and methods that would be followed for the protection, recovery, disposal, rehabilitation, and release of potentially affected wildlife. Techniques include minimizing wildlife contamination through hazing or other means. In the event wildlife capture or treatment is required, North Slope Energy would activate the International Bird Rescue and Rehabilitation Center for assistance. Permit forms for collection and storage will be completed and submitted to the appropriate agencies for approval prior to undertaking these activities

4.5 CATHODIC PROTECTION FOR TANKS [18 AAC 75.065(h)(2), (i)(3) or (j)(3)]

Not applicable.

4.6 LEAK DETECTION FOR TANKS [18 AAC 75.065(i)(4) or (j)(4) or (h)(1)(D)]

Cross-reference:

Sections 2.1.7, 2.1.8, and 2.5

Not applicable.

North Slope Energy exploration operations use shop-fabricated, temporary oil storage tanks and would be staffed 24-hours per day. Standard operating procedures and BMPs provide for daily inspections of fuel tanks and secondary containment areas to detect leaks. Because the tanks associated with drilling are not a field-constructed, permanently fixed, aboveground facility, daily visual inspections, as outlined in Section 2.5, provide the most reliable, feasible, and cost-effective means to determine leaks.

4.7 TANK LIQUID LEVEL DETERMINATION [18 AAC 75.065(k)(3) and (4) and 18 AAC 75.066(g)(1)(C) and (D)]

Cross-reference:

Sections 2.1.7 and 2.1.8, Attachment 2.1-A

Tank liquid levels are manually measured to determine the required volume prior to any fuel transfers. Manual gauging methods include using a sounding line or staff to measure tank level and determine

volume by calculating the available volume with and adequate buffer for product expansion. Transfer operations are continuously monitored at all times using a minimum of two operators. The two operators must remain in direct line-of-sight, in constant radio communication, and with one person having the ability to immediately shut off the transfer operation. Fluid transfers follow the inspection and fluid transfer procedures noted in Sections 2.1.7 and 2.1.8, respectively, and Attachment 2.1-A.

Tank liquid levels will be manually measured prior to transfers and visually monitored (e.g., by direct observation through the hatch, using a flashlight) throughout the duration of the filling process. Direct measurement of tank volume and visual observation may be more accurate and reliable than other devices such as sight glasses and float gauges, because of their increased susceptibility to damage in mobile tanks. Sight glasses also tend to frost over in arctic conditions. BMPs indicate two operators present, in direct line-of-sight of each other, for the duration of the fuel transfer, with one person having the ability to shut down the fuel transfer in the event of an emergency. Of the six alternative methods presented in Table 4.7-1, visual and manual measurement methods provide the most reliable, feasible, and cost-effective alternative,

Currently, five types of liquid-level/leak-detection measurement devices are used in fuel storage tank applications: electronic, pressure transducers, pneumatic, sight glass, and float gauge. Electronic types typically employ ultrasonic or microwave frequency transducers. In the context of small portable and temporary tanks, the effective utility of the devices is greatly compromised.

Small portable tanks that are mounted on motor vehicles are subject to vibrations and jolts from operation on unimproved roads and wind gusts. These conditions result in liquid-level measurements that fluctuate constantly, particularly for the more sensitive devices such as microwave frequency. Float-type devices are particularly prone to damage under these conditions. While it is possible to tune associated controller outputs to mitigate the effects of vibration and jolts, such a state of tune would significantly decrease their accuracy and response times in terms of liquid-level measurement and preclude their use as leak-detection devices.

Small temporary tanks located on gravel or ice pads, or on the drill rig itself, would be subject to similar vibrations and jolts. Accordingly, the use of vibration-sensitive, liquid-level devices on portable tanks would result in unreliable liquid-level measurement as well as frequent false alarms in high level and leak detection. Additionally, tank handling during loading, transportation, and unloading may also result in physical damage to the level determination device, such as sight glass devices, or electronic components contained therein (as applicable).

If liquid-level devices are used to control automatic shutoff valves or pump shutoff relays, then unanticipated valve closures or pump shutdowns may occur, with potential oil spill consequences. The unreliability of liquid-level devices on small, portable tanks precludes their use in this operation.

Table 4.7-1
Best Available Technology Analysis: Tank Liquid-level Determination System

BAT Evaluation Criteria	PROPOSED METHOD: Manual Measurement and Visual inspection	ALTERNATIVE 1: Microprocessor-based Electronic Control System	ALTERNATIVE 2: Hard-Wired Relay Logic Control System	ALTERNATIVE 3: Pneumatic Control System	ALTERNATIVE 4: Sight Glass with Ball Check Valve Control System	ALTERNATIVE 5: Float Level Gauge (Varec) Control System
AVAILABILITY: Whether technology is best in use in other similar situations or is available for use by applicant.	Proposed method	Microprocessor-based programmable logic controllers (PLCs) are used in almost all electronic control systems in industry today. The reason for PLCs' popularity is that the controllers have proven to be BAT over the past 20+ years.	Hardwired relay logic, control systems are still in use today but are becoming less popular.	Pneumatic control systems are used in very few applications today and never where pumps and motors are turned on or off.	Sight glass with ball check, valve systems are used today but less frequently than other devices.	Float-actuated level gauge, such as Varec, devices are widely used in the industry today.
TRANSFERABILITY: Whether each technology is transferable to applicant's operations	Transferable	Allen Bradley SLC5 PLCs and all instrumentation are not transferable to the drill rigs.	Undetermined	Undetermined	Undetermined	Transferable
EFFECTIVENESS: Whether there is a reasonable expectation that each technology will provide increased spill prevention or other environmental benefits.	Highly effective with strict adherence to BMPs and local procedure. Tank liquid levels will be determined from direct measurement and observation through the hatch, using a flashlight. As good as or better than other "low tech" devices.	Not effective in this application.	Not effective in this application. In addition, relay systems do not provide for logic status monitoring or alarming.	Not effective in this application. In addition, pneumatic systems are prone to freezing, if moisture build-up occurs in the tubing.	Not effective in this application. Sight glass systems are prone to breaking, becoming obstructed, and freezing if moisture build-up occurs in the tubing. In addition, the ball check valves are prone to freezing and sticking in either the open or closed position.	Not effective in this application. Float-actuated level gauges are prone to breaking in mobile/portable tanks and freezing/frosting in arctic conditions.
COST: The cost to the applicant of achieving BAT, including consideration of that cost relative to the remaining years of service of the technology in use by the applicant.	Not applicable	The cost to redesign the rig and its associated storage tank would be high.	The cost of design changes to a relay based logic system is high. Re-wiring is required for any revision.	The cost of design changes to a pneumatic logic system is high. Re-tubing is required for any revision.	Undetermined	Undetermined

Table 4.7-1
Best Available Technology Analysis: Tank Liquid-level Determination System

BAT Evaluation Criteria	PROPOSED METHOD: Manual Measurement and Visual inspection	ALTERNATIVE 1: Microprocessor-based Electronic Control System	ALTERNATIVE 2: Hard-Wired Relay Logic Control System	ALTERNATIVE 3: Pneumatic Control System	ALTERNATIVE 4: Sight Glass with Ball Check Valve Control System	ALTERNATIVE 5: Float Level Gauge (Varec) Control System
AGE AND CONDITION: The age and condition of technology in use by the applicant.	Procedures have been commonly used in the industry for fuel transfer operations.	Not applicable (N/A)	N/A	N/A	Sight glass devices have been used in the industry for at least 20 years, mostly on permanent tanks.	Float-actuated devices have been used in the industry for at least 20 years.
COMPATIBILITY: Whether each technology is compatible with existing operations and technologies in use by the applicant.	Compatible and widely used. Requires no change.	Compatible but not used on portable tanks and tanks on rigs.	Compatible but not used on portable tanks and tanks on rigs.	Compatible but not used on portable tanks and tanks on rigs.	Compatible but preferably not used on portable tanks and tanks on rigs, due to breakage potential.	Compatible and used in the industry on tanks in Alaska.
FEASIBILITY: The practical feasibility of each technology in terms of engineering and other operational aspects	Feasible and preferred due to potential for electronic or pneumatic systems to experience damage from rough handling.	Rig tanks are frequently moved over rough roads. Rough handling has the potential to affect the accuracy and/or operability of the system.	Rig tanks are frequently moved over rough roads. Rough handling has the potential to affect the accuracy and/or operability of the system.	Rig tanks are frequently moved over rough roads. Rough handling has the potential to affect the accuracy and/or operability of the system.	Rig tanks are frequently moved over rough roads. Rough handling has the potential to break the sight glass. Sight glass devices are typically not used in exposed areas, as they can become a source for a leak if damaged.	Feasible, but would require some engineering modifications to install, and operational modifications. There is concern over the use of float devices, because several failures of float devices within the state.
ENVIRONMENTAL IMPACTS: Whether other environmental impacts of each technology, such as air, land, water pollution, and energy requirements offset any anticipated environmental benefits.	None	None	None	None	None	None

Note that flow-test tank fluids are typically composed of oil, water, associated emulsions, and suspended solids. The multiphase nature of these fluids adversely impacts the accuracy and reliability displayed by a variety of level-determination devices. For example, microwave frequency device accuracy is compromised by variations in liquid dielectric constant and electrical conductivity, accordingly application in multi-phase liquid contexts is contradictory. Alternatively, ultrasonic devices require contact with the process fluid; solids buildup or emulsion adherence to the sensor will result in decreased accuracy and the need for frequent maintenance.

Mechanical devices, such as float-actuated, are also subject to greatly reduced accuracy and reliability, resulting from solids content. These solids facilitate float "sticking" and "jamming." In addition, extreme cold weather results in pulleys that may not roll freely or that freeze altogether, or associated cable systems that become inflexible. Any one or more of these effects will render the device unreliable in terms of accurate level determination. Spill data indicate that a significant number of spills have resulted because of malfunctioning tank-level gauges.

Discussion with, and technical literature provided by, manufacturers of electronic devices indicates that temperatures lower than -30 °F compromise the reliability and response time of the electronic components of these devices. The North Slope commonly experiences temperature of -30 °F or lower during winter. Applications subject to these temperatures would not be guaranteed for accuracy.

In summary, the application of additional (i.e., in addition to direct observation with manual gauging) liquid-level determination devices to portable and temporary tanks in remote arctic environments are not desirable for the following reasons:

- Significant potential for physical damage, or damage to associated electronic components, as a result of loading, unloading, or transportation
- Requirement for power source – a potential source of ignition
- Need for frequent maintenance
- Lack of warranty
- Decreased accuracy
- Decreased reliability
- Significant cost (e.g., device, power, installation, maintenance, and replacement)

4.8 MAINTENANCE PROCEDURES FOR BURIED METALLIC PIPING [18 AAC 75.080(b)]

Not applicable.

4.9 PROTECTIVE COATINGS OR CATHODIC PROTECTION FOR PIPING [18 AAC 75.080(d), (k)(1), (l) or (m)]

Requirements for buried piping or piping associated with marine structures are not applicable.

Facility piping requirements would not be applicable since no metallic piping is used in connection with regulated aboveground storage tanks.

4.10 CORROSION SURVEYS [18 AAC 75.080(k)(2)

Not applicable.

4.11 PIPELINE LEAK DETECTION, MONITORING, AND OPERATIONS [18 AAC 75.055(a)]

Not applicable.

5.0 RESPONSE PLANNING STANDARDS

Cross-reference:

18 AAC 75.425(e)(5)

18 AAC 75.430(b)

18 AAC 75.434

Response Planning Standards

Well Blowout

The RPS volume for the West Inigok Area exploration project is based on an unassisted well-flow value of 5,500 bopd at the wellhead with a predicted gas-to-oil ratio (GOR) of 600. The planned blowout scenario continues for a period of 15 days of total discharge volume of 82,500 bbl.

Per 18 AAC 75.434 (b), the blowout volumes for RPS purposes may be lower, if relevant technical data demonstrate that a lower volume is reasonable. However, if the actual flow rate of a completed well exceeds the planned RPS volume of 5,500 bopd and the facility is to continue operations, a plan amendment will be submitted to the ADEC to modify the RPS within 30 days.

The 1997 S.L. Ross Model (Belore et al. 1997) is used for determining the oil deposition resulting from a hypothetical blowout. According to the S.L. Ross Model, the oil is ejected from the well in an aerial plume and 10 percent of the discharged oil is assumed to remain suspended in the air in the form of droplets so small (50 micrometers) that they do not fall to the earth. This results in an effective volume of 73,330 bbl available for mechanical recovery. However, in order to demonstrate the response capability to mechanically recover the entire 73,330 bbl discharge volume, the 10 percent which remains airborne in the S.L. Ross model is included in the total deposition volume.

The receiving environment would be an ice pad surrounded by frozen and snow-covered tundra and water body surfaces. Oil travels from the well in an aerial plume. The deposition of the aerial plume used in the response scenarios in Section 1.6.12 is based on the S.L. Ross model.

Drilling Season

North Slope Energy's drilling season will be determined on a project-by-project basis (provided all permits are obtained and the tundra is open to travel). The cessation of drilling date is determined by adding the number of days for obtaining blowout control and the number of days for cleanup and then subtracting them from the tundra closure date. This resulting cessation date is the last day for drilling into any new hydrocarbon zones. Once this zone is penetrated, North Slope Energy will cement the casing to the formation. Drilling may continue as long as no new hydrocarbon zones are penetrated. All equipment will be removed prior to the tundra closure date, established by the BLM.

Response Strategy

Oil Storage Tank Spill

Response Strategy 1 has been included to demonstrate general procedures to respond to a discharge of any size. This strategy presumes a flange leak from a 10,000 gallon rig fuel tank during winter operations. None of this volume would reach open water.

Volume capacity of tank	10,000 gallons
60 percent adjustment for secondary containment	- 6,000 gallons
Adjusted RPS Volume	4,000 gallons

North Slope Energy has applied a 60% prevention credit consistent with provisions of 18 AAC 75.432. This prevention credit is based upon the project's use of impermeable secondary containment for oil storage tanks greater than 10,000 gallons. All regulated tank containment would be constructed to hold at a minimum 110 percent of the capacity of the largest tank volume.

North Slope Exploration, LLC

OIL DISCHARGE PREVENTION AND CONTINGENCY PLAN

Addendum A

EXPLORATION WELLS

UCW-1

UCW-2

August 2022

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ACRONYMS AND ABBREVIATIONS

bbl/day	barrels per day
Drill Site 2P	DS-2P
Drill Site 4	Drill Site 4 Grind & Inject Facility
core plan	Oil Discharge Prevention and Contingency Plan
CPF-1	Central Processing Facility 1
ft	feet/foot
gal	gallon(s)
GC-1	Gathering Center 1
MHz	megahertz
mi	mile(s)
mph	miles per hour
North Slope Energy	North Slope Energy, LLC
NPR-A	National Petroleum Reserve – Alaska
RPS	response planning standard
UHF	ultra-high frequency
VHF	very-high frequency

Note: The following addresses additional site-specific information not provided in the North Slope Energy Oil Discharge Prevention and Contingency Plan (core plan). The section numbering of this addendum corresponds to the section numbers of the core plan to facilitate cross-referencing. Only those sections affected by the addendum are included. Most core plan sections are not amended by addendum information and therefore unmodified sections are intentionally omitted.

INTRODUCTION

North Slope Energy plans to drill up to two exploratory wells during the 2023 winter season in the area west of Inigok Airstrip within the NPR-A. All planned exploratory drilling projects would be conducted upon ice pads using overland packed snow roads originating from Drill Site 2P (DS-2P) and extending west across the Colville River to the West Inigok Area exploration drill sites. The route will continue west past the Inigok Airstrip on packed snow routes to the various well locations.

The All American 111 drill rig will be mobilized to drill up to two well sites located within approximately 18 miles west of Inigok Airstrip. Snow road from Inigok will be constructed for project mobilization and operations and include staged response equipment, storage tanks, camp, and ice road and pad construction equipment. Table A1-1 shows the surface locations for the proposed wells.

Table A1-1
Well Site Locations

Well Name	Latitude	Longitude	Meridian	Township	Range	Section
UCW-1	69.965390	-153.549056	U.M.	T7N	R7W	14
UCW-2	69.883514	-153.599896	U.M.	T6N	R7W	10

Notes:
All locations shown in WGS84

1.0 RESPONSE ACTION PLAN

1.4.2 Communications Equipment

The North Slope Energy exploration drilling operations would use satellite and microwave communication systems that would provide broadband voice, data, and facsimile lines (Table A1-2). Primary communication would consist of a VSAT system with satellite dish antenna for phones and data. The rig and camp will be linked by two WAP units and microwave node for direct communications. Additionally, line-of-sight communications would be provided through UHF and VHF radios. In the event of a response incident, a transportable communication system would be deployed to support UHF and VHF portable radios use with field operations.

Table A1-2
Communication Equipment

Primary Communications	**VSAT Satellite**
Rig/Office	10-12 telephone lines
Secondary Communications	**Wireless Data**
Rig/Office	3-10 MB/s internet access
Tertiary Level Communications	**Two Way VHF Radio**
Rig	1-6-watt VHF, 136-174 MHz
Mobile	10-50 watt VHF, 136-174 MHz

Notes:
MHz=megahertz
VHF = very-high frequency

Drill Site Contacts

Telephone numbers for drill site contacts are provided in Table A1-3.

Table A1-3
Drill Site Contact Numbers

Drill Site Position	Office Number	Cell Number
Drill Site Manager	TBD	TBD
Tool Pusher	TBD	TBD
Field Environmental Coordinator	TBD	TBD

1.5.1 Transportation to Spill Site

Access

The primary mobilization option for response would be to initially deploy track and low pressure vehicles to haul equipment over snow/ice road constructed from DS-2P to the respective drill sites. In response to a major incident, ice road construction equipment would be mobilized to armor and thicken the pack snow road to enable conventional vacuum trucks, dump trucks and other equipment to access the Inigok Staging Area and well sites. Figure A1-1 shows the ground travel distances between the well sites, Inigok Staging Area and DS-2P, where the snow/ice road departs from the gravel road infrastructure. Table A1-4 lists the ground travel distances from Inigok, DS-2P, CPF-1 and DS-4 Grind & Inject Facility (DS-4) to the proposed well sites.

For planning purposes, transit speed is established at 35 mph over armored snow/ice roads. Average travel time between Inigok and the DS-4 would be 4.3 hours.

Table A1-4
Ground Travel Distances

	Inigok (miles)	DS-2P (miles)	CPF-1 (miles)	GC-1 (miles)	DS-4 (miles)
UCW-1	12	88	122	146	161
LCW-1	18	94	128	152	167

CPF-1=Central Processing Facility 1
DS-2P=Drill Site 2P
DS-4 = Drill Site 4 Grind & Inject Facility
GC-1 = Gathering Center 1

The Inigok Airstrip could provide additional response access. Average in-flight travel time to the airstrip from Deadhorse is less than 40 minutes; from Fairbanks, travel time is 67 minutes; and average travel time from Anchorage to the airstrip is estimated to be 1 hour, 48 minutes. These travel times are calculated based on a Hercules C-130 traveling at an estimated average airspeed of 345 miles per hour.

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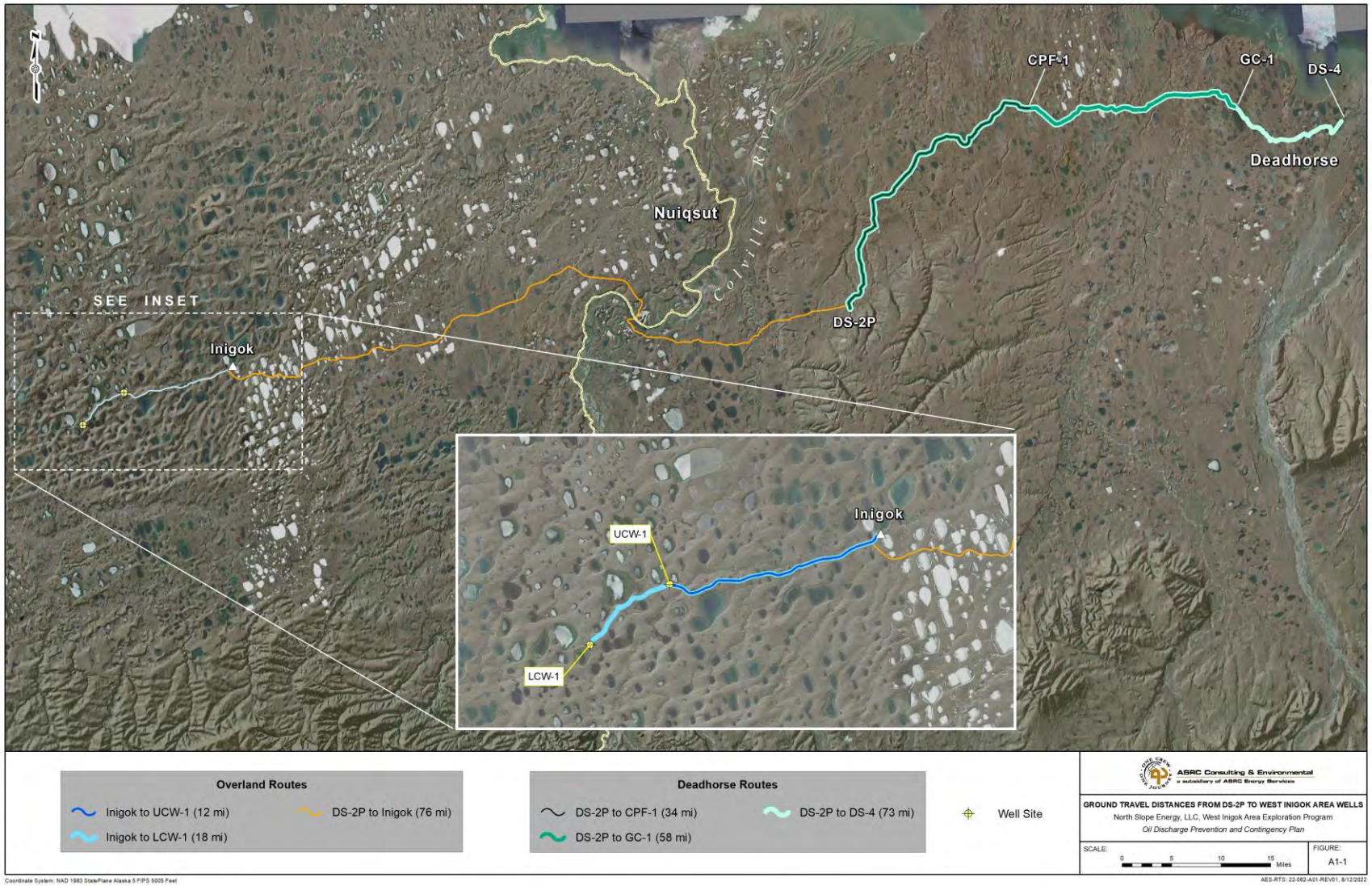
Figure A1-1 Ground Travel Distances – DS-2P to West Inigok Area Wells



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3.0 SUPPLEMENTAL INFORMATION

3.1 Facility Description and Operational Overview

3.1.1 Facility Ownership and General Site Description

North Slope Energy's exploratory operations would begin as soon as favorable winter weather conditions permit snow snow/ice road construction and mobilization. Up to two wells may be drilled over the winter season. Based upon response planning, the last day for drilling into any new hydrocarbon zones would be April 1. The cessation of drilling date is determined by subtracting 30 days from April 30 (a conservative average working date for closure of tundra travel in the NPR-A). The 30 days comprise 15 days for mobilization and completion of well capping operations and 15 additional days for recovery and cleanup operations to conclude. North Slope Energy will cement the casing to the formation. Drilling may continue as long as no new hydrocarbon zones are penetrated. Well testing operations may be conducted to measure well flow potential. All equipment will be removed before the tundra closure date established by the Alaska Department of Natural Resources and the Bureau of Land Management.

Response Planning Standard Volume

The response planning standard (RPS) volume for an exploratory well blowout is based upon the predicted highest possible flow potential for the planned project area as established by ADEC. The predicted planning volume is determined to be 5,500 barrels per day (bbl/day) with a gas-oil ration of 600. For a blowout duration lasting 15 days, the RPS volume would be 82,500 bbl. *Scenario 1 – West Inigok Area Exploration Well Blowout during Winter* in Section 1.6.12 of the core plan describes the response strategies and resources necessary to control, contain and clean up the RPS volume for a well blowout in the most distant comparable location prior to the closure of tundra travel.

Drill Site and Camp

Operations would be conducted on temporary ice pads, approximately 600 feet (ft) by 600 ft, constructed at the selected drill sites. Access to the site would be via a snow/ice road connecting the drill sites to the Inigok staging area and DS-2P. Two camps will be established at the drill site and two support camps are planned at an ice pad staging area to be established nearby DS-2P. Before the commencement of drilling operations, drill site diagrams would be provided depicting the specific layout of the rig, camp, oil storage, and access road entrance.

Drilling operations will utilize the All American 111 rig.

3.1.2 Oil Storage Containers

Table A3-1 lists the fuel tanks used to support the All American 111 drill rig, camps, and operations. The tank(s) would be located within secondary containment that provides at least 110 percent secondary containment of the capacity of the single largest tank. No tanks would be manifolded to another tank by connecting pipes. Mineral oil-based mud may be used to support drilling.

Table A3-1
All American 111 Rig and Support Tanks

Number	Service	Staging Location	Capacity (gal)
1	Rig diesel fuel supply, double-wall	Drill site	6,400
1	Rig diesel day supply, double-wall	Drill site	100
7	Combined mud pit system (6 compartments and one trip tank)	Drill site	25,200
4	Auxiliary diesel fuel supply, double-wall	Drill site	9,980
3	Auxiliary diesel fuel supply, double-wall	DS-2P staging pad	9,980
2	Camp fuel supply, single-wall	Drill site	1,500
2	Camp fuel supply, single-wall	DS-2P staging pad	4,000
1	Envirovac unit	Drill site	500

Table A3-2 provides and inventory of oil storage tanks greater than 10,000 gallons in size that may be deployed in the event of flow testing or other operational needs. Specific tanks and inspection details will be provided prior to placing into service on the project.

Table A3-2
Oil Storage Tanks Greater than 10,000 Gallons Capacity

Tank Number	Construction Standard	Capacity (gal)	Year Built	Last; Next Internal Inspection	Last; Next External Inspection	Configuration
TBD						
TBD						
TBD						
TBD						
TBD						
TBD						

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Fuel Transfer Procedures

All fuel transfers conducted at this mobilization camp shall follow the transfer procedures as defined in Section 2.1.7 and Attachment 2.1-A of the core plan.

Secondary Containment

All secondary containment structures for the oil storage tanks will be constructed and inspected in accordance with Sections 2.1.9 and 2.5.1 of the core plan.

Notification Procedures

All procedures listed in Section 1.2 of the core plan shall be followed in the event of any spill associated with this exploration drilling activity.

Emergency Action Checklists

For site-specific emergency actions, refer to Section 1.1, Emergency Action Checklists, in the core plan.

3.2 Receiving Environment

The proposed West Inigok Area exploration drill sites are located west of the Colville River in the NPR-A (Refer to Figures 1.8-1 and A3-1). The receiving environment is characterized by snow-covered frozen tundra, lakes, ponds and freshwater river and stream surfaces. Wells are located at a minimum of 500 ft from any major lake, stream, or river. In the event of a spill, response efforts to contain and clean up a spill would occur before breakup to prevent the discharge from reaching open water. In the event a discharge reaches a frozen water body, containment, recovery, and cleanup operations would give priority attention to frozen water bodies and high-value habitats, particularly possibly affected fish-bearing water bodies and summer nesting sites. If a spill impacts tundra, containment, recovery and rehabilitation tactics for tundra would be conducted using the Tundra Treatment Guidelines. It would be a response priority to remove all the oil possible before the onset of spring thaw to minimize lasting tundra damage and speed rehabilitation.

The project area has been physically surveyed to ensure that cultural resources would not be adversely affected by operations or discharges. The distribution of sensitive or vulnerable resources that should receive priority protection for oil spill planning and response has been evaluated (Table A3-3 and Figures A3-1 through A3-7).

Exploratory drilling would be conducted entirely in the winter season during frozen conditions. The drilling schedule is based upon completion of all drilling operations into new hydrocarbon zones no later than April 1 of each year. This drilling end-date leaves a sufficient number of days prior to the average onset of breakup to achieve blowout control and complete cleanup operations.

In general, the project area contains extensive wetland complexes, rivers, meandering streams, and lakes. Based upon wind data and blowout plume trajectory modeling, a blowout from some of the planned wells has the potential to encounter frozen water surfaces. The response strategies and tactics described in *Scenario 1– West Inigok Area Exploration Well Blowout during Winter* (core plan) provide examples of containment strategies that would be employed at any well location including the construction of snow berms surrounding the pad to confine the largest concentration of the fallout. Recovery efforts would be directed at achieving the highest levels of cleanup where spring run-off could potentially affect water bodies.

Some lakes and ponds near proposed well locations were evaluated as possible water sources for building ice roads and ice airstrips. Depth and the presence of fish (along with other criteria) were characterized. Techniques to aid in cleanup would include building snow berms during the blowout (to the degree possible with proper safety considerations) to prevent flow of oil onto frozen water bodies.

Specific information regarding the receiving environment and possible special considerations at each proposed drill site are presented in Table A3-3.

Table A3-3
Receiving Environment – Sensitive Resources and Considerations for Winter Season

Proposed Well	Sensitive Resources	Water Bodies and Additional Considerations
UCW-1	Caribou may be present during all seasons with calving generally in May-June. Polar bear denning is not documented in the proposed well vicinity. Spectacled eider, Steller's eider, and yellow-billed loon nesting are not present during winter.	Well would be sited within the vicinity of tundra ponds and a small meandering stream, located outside the modeled plume deposition zone. If necessary, a snow berm would be constructed around the deposition zone for containment.
LCW-1	Caribou may be present during all seasons with calving generally in May-June. Polar bear denning is not documented in the proposed well vicinity. Spectacled eider, Steller's eider. and yellow-billed loon nesting are not present during winter.	Modeled plume indicates potential deposition onto a snow-covered, frozen tundra lake. If necessary, a snow berm would be constructed around the deposition zone for containment. Cleanup would prioritize oil and snow/ice removal on affected lake surface areas.

Figure A3-1 through A3-7 show the proposed drill site locations in relation to wildlife area resource information obtained from the Alaska Department of Fish and Game and the US Fish and Wildlife Service. Figures A3-8 through A3-9 provides site-specific details for the prospects, including:

- Drill site locations
- Predicted plume deposition
- Waterbodies in the near vicinity of well sites.

Figure A3-1 Receiving Environment – Central Arctic Caribou Herd

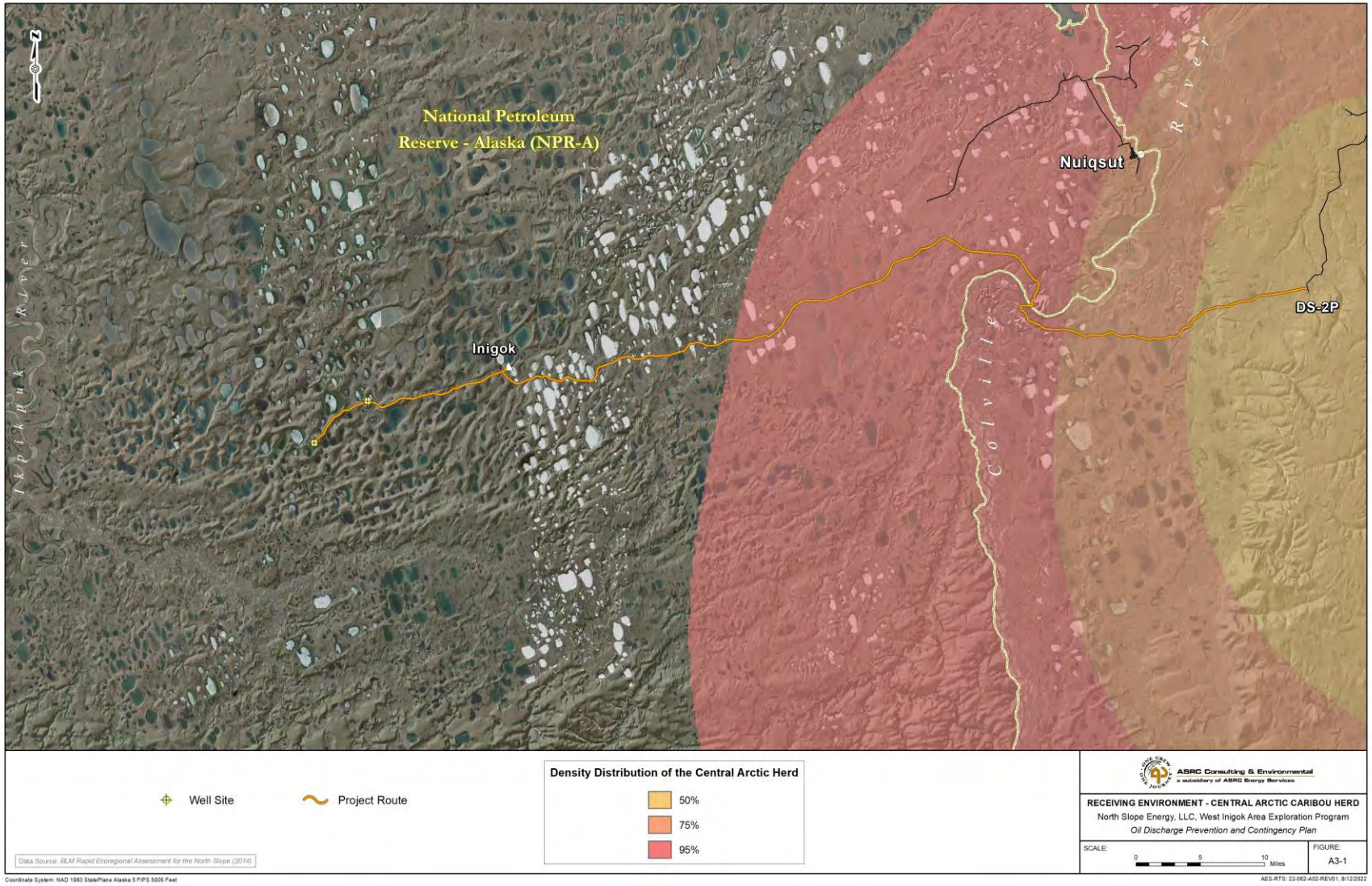

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Figure A3-2 Receiving Environment – Teshekpuk Caribou Herd

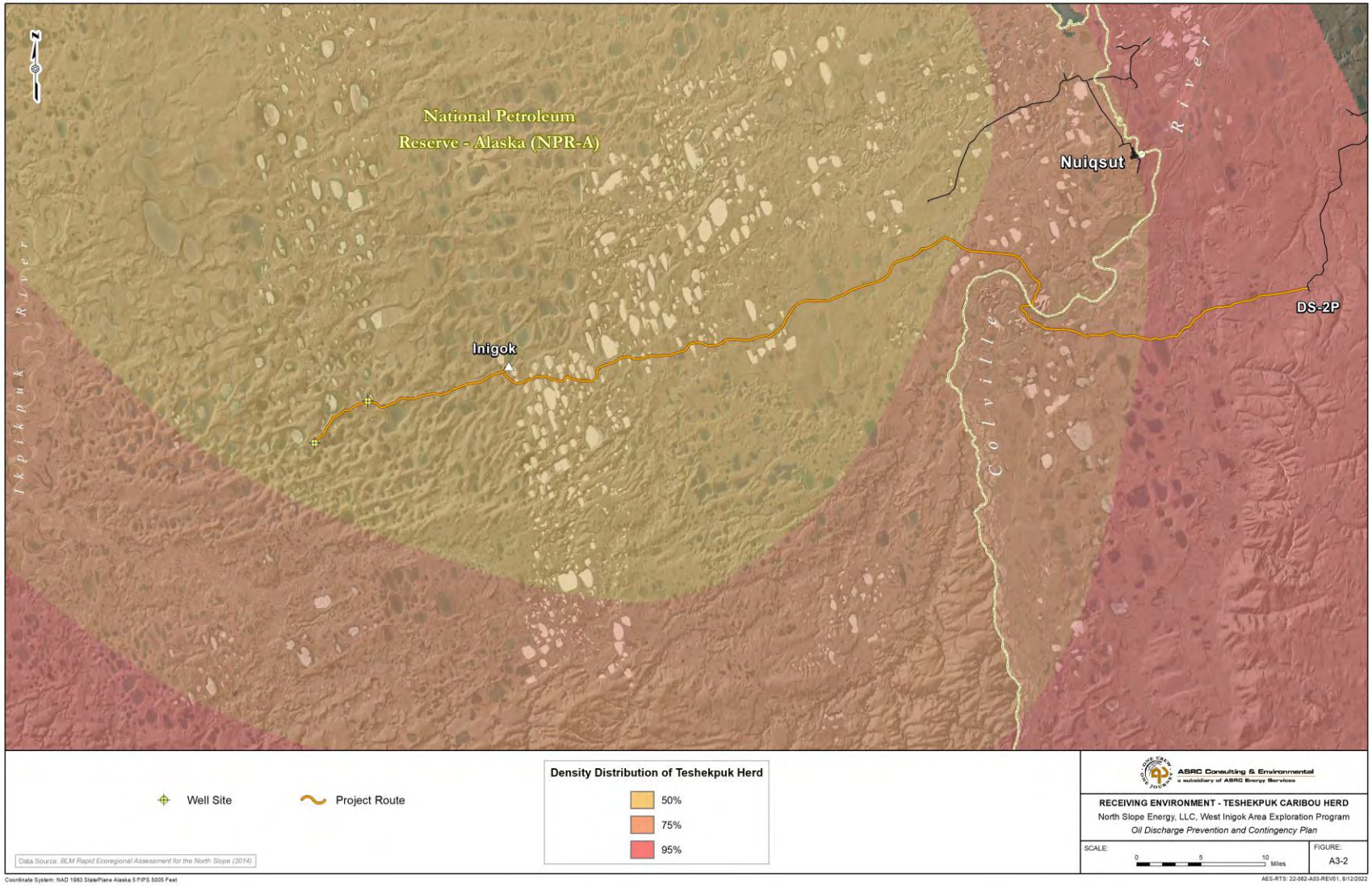

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Figure A3-3 Receiving Environment – Spectacled Eider

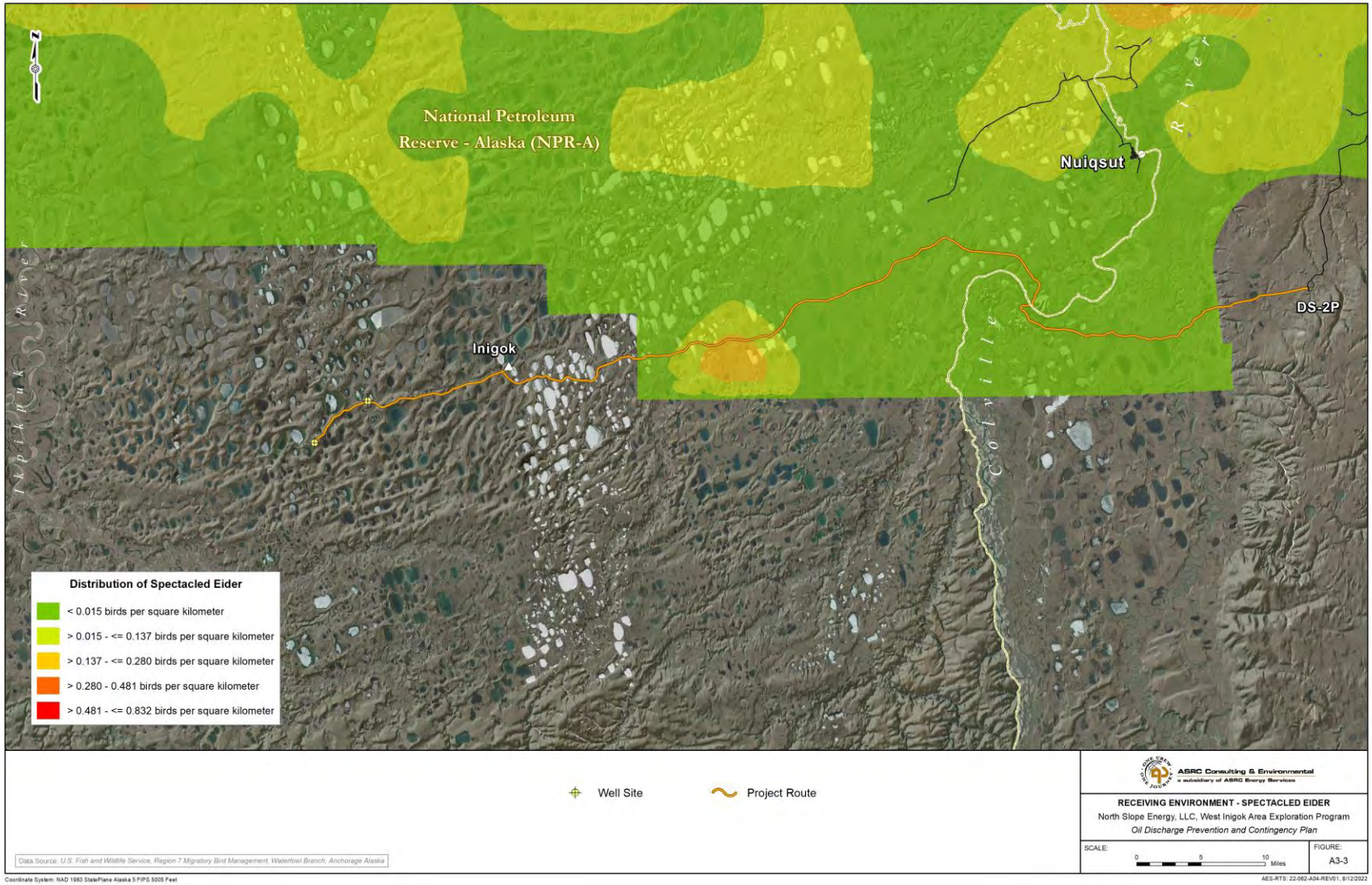

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Figure A3-4 Receiving Environment – Steller's Eider

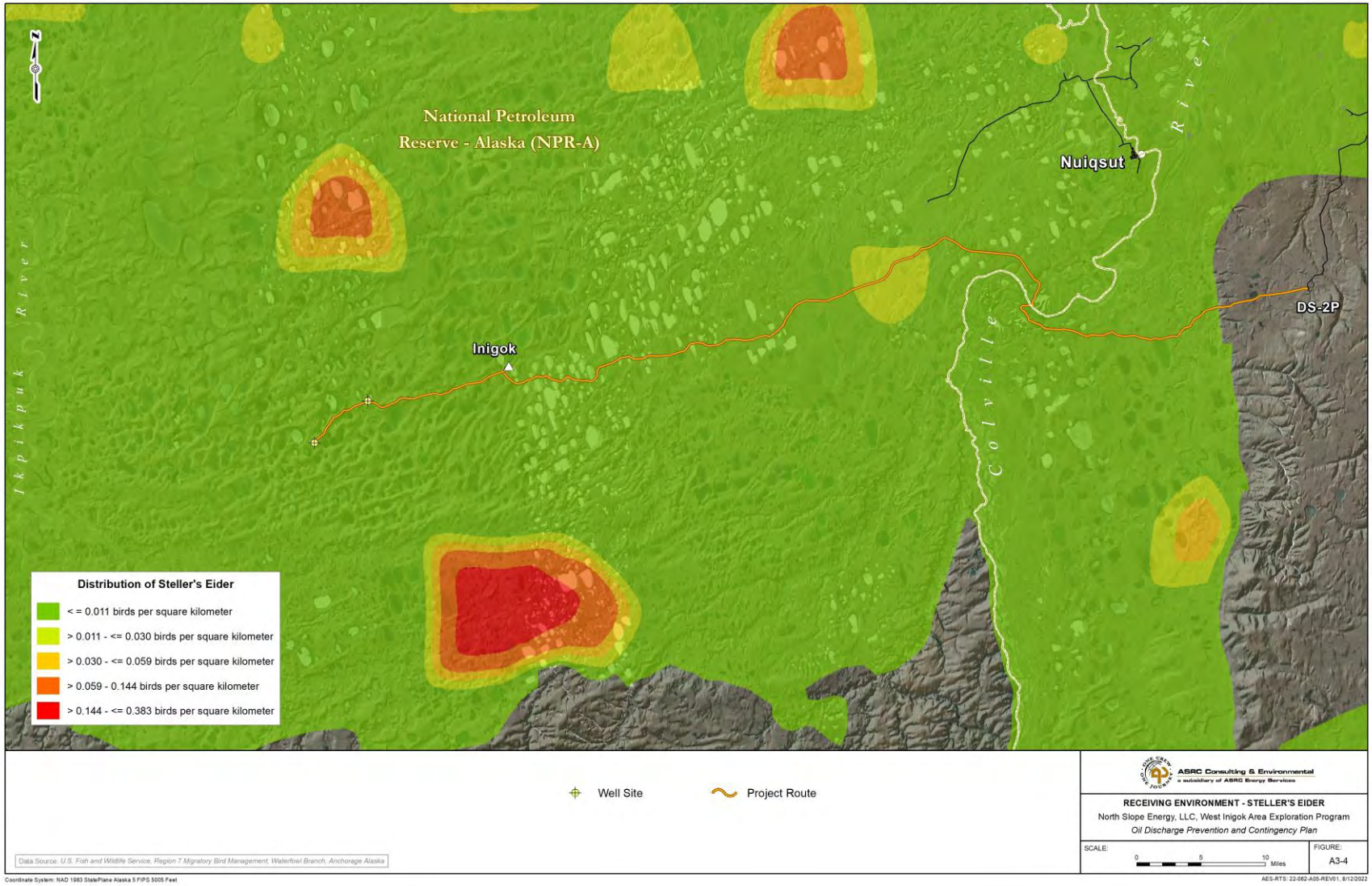

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Figure A3-5 Receiving Environment – Yellow-Billed Loon

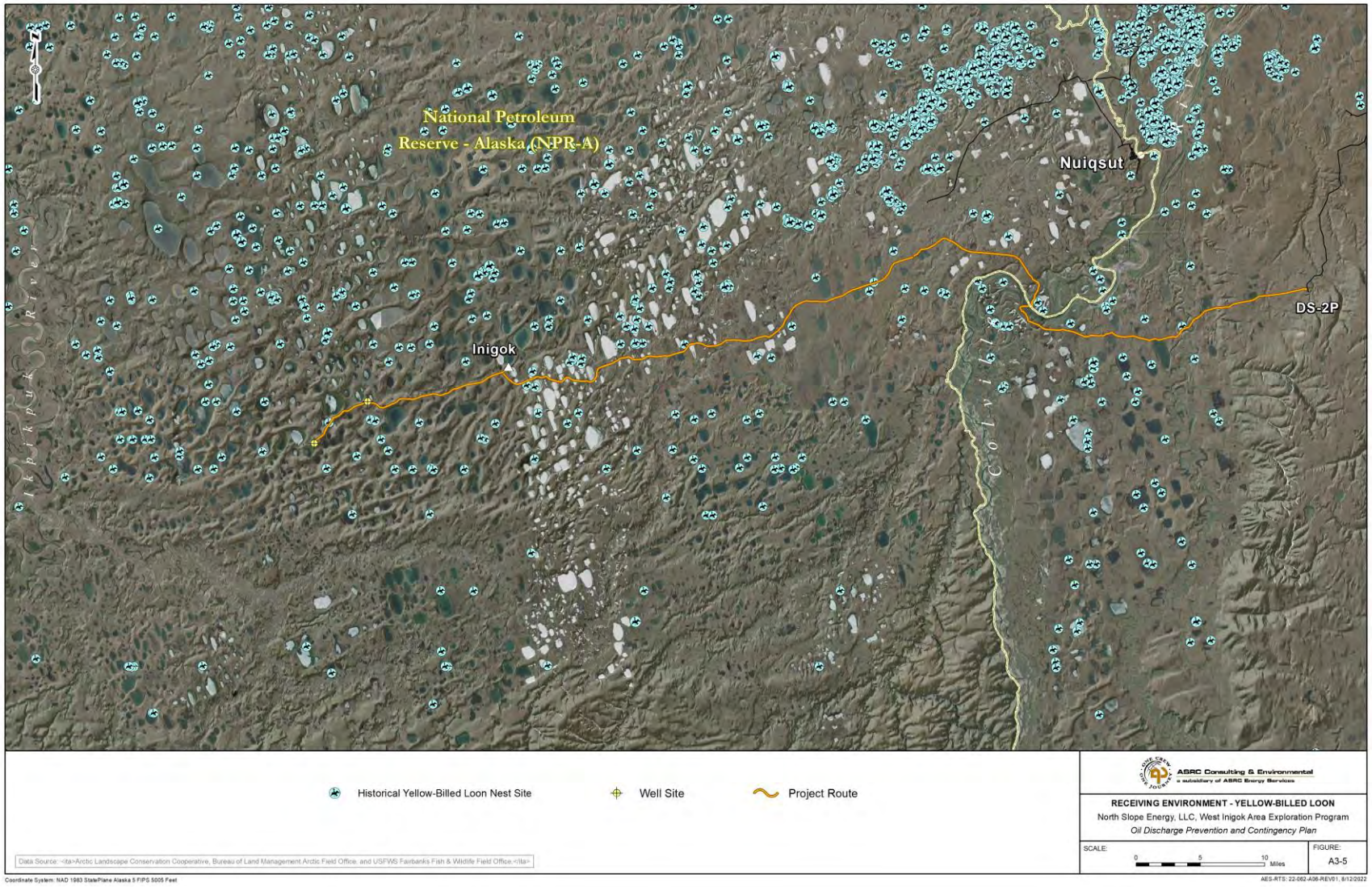

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Figure A3-6 Receiving Environment – Polar Bear

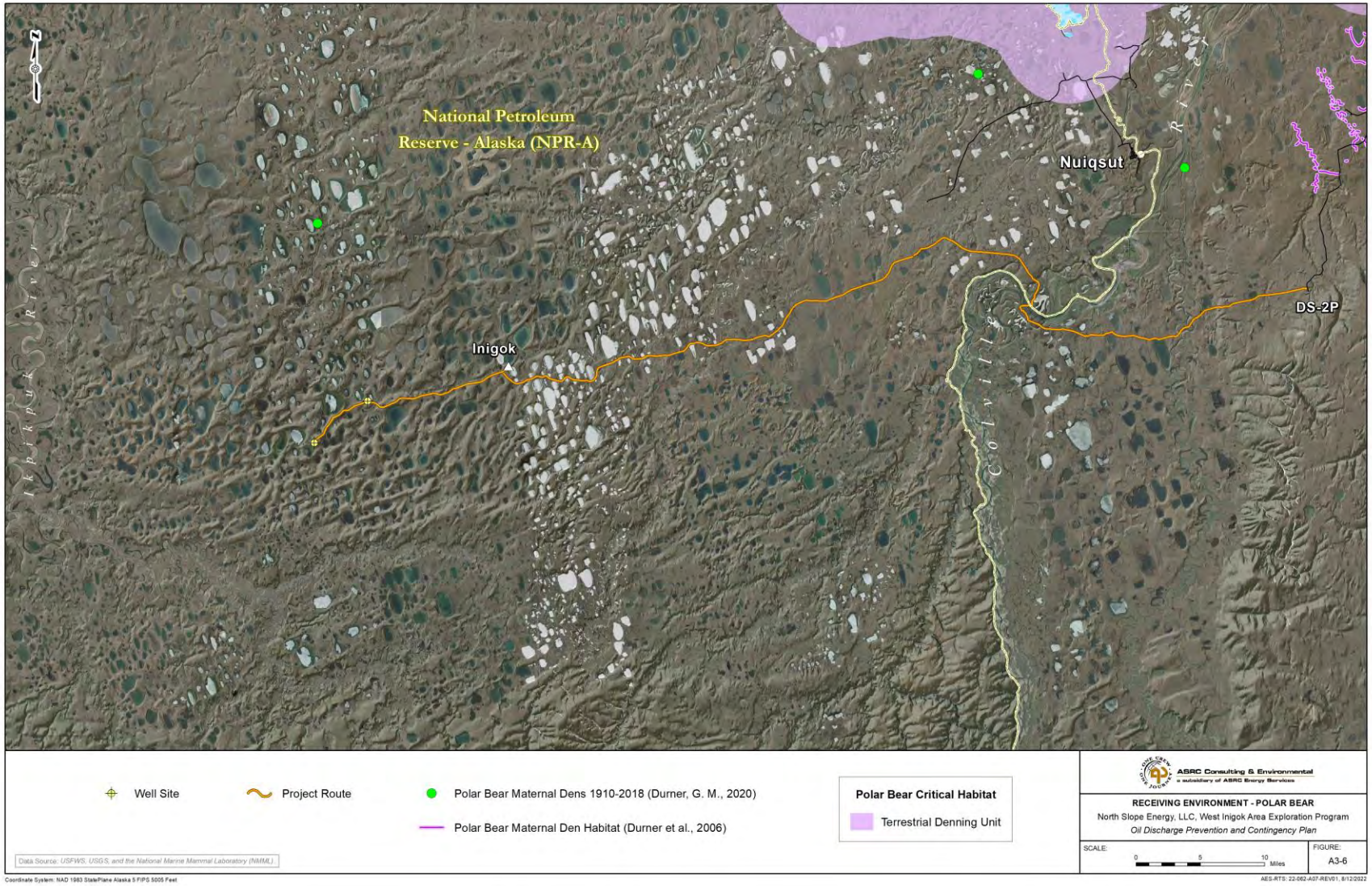

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Figure A3-7 Receiving Environment – Raptors

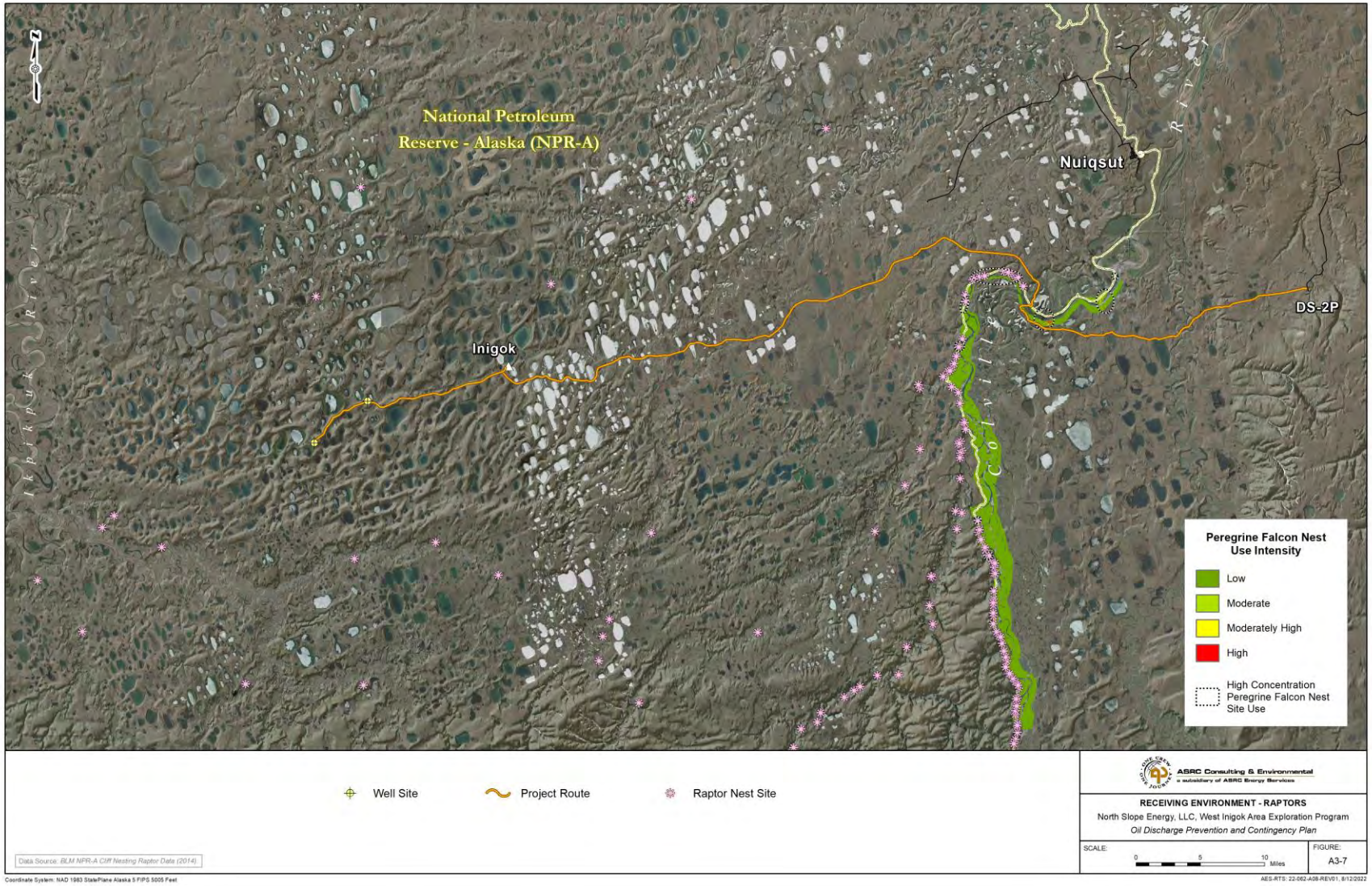

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Figure A3-8 Blowout Plume – UCW-1

Figure A3-9 Blowout Plume – LCW-1

3.3 Command System

3.3.2 North Slope Energy Incident Response Organization

The North Slope Energy Incident Management Team names and telephone numbers are listed in Table A3-4.

Table A3-4
Incident Management Team Name and Telephone Numbers

Title	Name	Work Number	Cell
Incident Commanders	TBD	TBD	TBD
On-scene Commander	Drill Site Manager	TBD	TBD
Public Information Officer Alternate	Witt O'Brien's	(985) 781-0804	
Safety Officer Alternate	Witt O'Brien's	(985) 781-0804	
Operations Section Alternate	Witt O'Brien's	(985) 781-0804	
Logistics Section Alternate	Witt O'Brien's	(985) 781-0804	
Planning Section Alternate	Witt O'Brien's	(985) 781-0804	
Finance Section Alternate	Witt O'Brien's	(985) 781-0804	

3.6 Response Equipment

3.6.1 Equipment List

The core plan (Table 3.6-1) provides a list of on-site response containers and contents to address spill response. Table A3-5 provides a select list of support contractor equipment that that could be mobilized to support drilling operations and response operations.

Table A3-5
Support Contractor Equipment

Quantity	Equipment
1	Loader
2	Grader
1	Excavator
13	Steiger tractors with trailer
2	PistenBully snow groomer
4	Tucker Sno-Cat
3	Water tank trailer
2	Snow blower
1	75-ton crane
2	Vacuum skid
7	Generator
10	Heater
8	Light plant
4	Shale bin
4	Trail groomer
10	Fuel sleigh
3	Fuel truck
5	Mobile camp