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June 2, 2023

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RE: NOTIFICATION UNDER WATER LICENCE N7L1-1834 SHELL CANADA ENERGY, CAMP FAREWELL

Please find attached a notification under Water Licence N7L1-1834 pertaining to upcoming activities at the former Camp Farewell Staging area, prepared by WSP Canada Inc. on behalf of Shell Canada Limited. The notification proposes soil assessment, groundwater monitoring, debris removal, fuel staging and helicopter refueling scheduled between June and September 2023. The results of the program will be documented in a annual report for the Site.

Should you have any queries, please contact Kyle Thompson, or the WSP contact listed within the attached documents.

Sincerely,

Kyle Thompson
Sr. Program Manager, Legacy Soil &
Groundwater Projects
Shell Canada Limited
Office - 1-403-691-3174 ext. 3174
E-mail - Kyle.Thompson@shell.com

Attachments: Notification under Water Licence N7L1-1834 Shell Canada Energy, Camp Farewell

DATE June 2, 2023 **Project No.** 22573538-1300-2341

TO Bijaya Adhikari, PhD.
Science and Regulatory Coordinator

CC Shell Canada Limited

FROM Punchalee Clair **EMAIL punchalee.clair@wsp.com**

NOTIFICATION UNDER WATER LICENCE N7L1-1834 SHELL CANADA ENERGY, CAMP FAREWELL

Introduction

On behalf of Shell Canada Limited (Shell), WSP Canada Inc. (WSP [formerly Golder Associates Ltd.]) is submitting this notification under Water Licence N7L1-1834 for upcoming soil assessment, groundwater monitoring, debris removal and fuel staging at Camp Farewell (co-ordinates 69°12'30.07"N/135°06'04.4"W), in the Inuvialuit Settlement Region, Northwest Territories (the Site; Figures 1 and 2).

This notification was developed to provide the Inuvialuit Water Board (IWB) a summary of the upcoming 2023 Scope of Work needed to transition the Site from assessment to remediation. The 2023 Scope of Work is based on results from the assessments completed in 2021 and 2022. Remedial activities are anticipated to start in 2024 and will be completed prior to the expiry of the Water Licence N7L1-1834 (2017 term amendment, expires July 17, 2029).

Throughout the field program, Shell will continue to follow the terms and conditions outlined in Water Licence number N7L1-1834.

Background

Camp Farewell operated as a camp and logistical staging area in support of the former Mackenzie Delta Drilling Program. The camp was established in 1969 and was used intermittently until 2012. During that time, Shell continually held leases and permits to operate at the Site. The former camp facilities consisted of an accommodation building, an airstrip, a bermed tank farm for fuel storage, an equipment storage area, wastewater storage (sewage lagoon), burn pit and a water withdrawal location.

Site decommissioning activities began in 2013 when then former sewage lagoon was dewatered, excavated and backfilled. Following the decommissioning of the sewage lagoon, the wastewater produced on-site was transported to the Inuvik disposal facility. Soil and groundwater assessments, decommissioning of the remaining major infrastructure and soil remediation was completed in stages until 2019. The Site is currently vacant except for existing monitoring wells, an emergency shack, woody debris from the wood pilings removal and a dock at a lake north of the Site. Confirmatory sampling of previous remediation areas was completed in 2021 and 2022.

In March 2023, Shell submitted an amendment request to the Environmental Impact Screening Committee (EISC) registry file [05-18-01] for additional soil assessment, debris removal and fuel staging during the summer of 2023.

The 2023 summer program was excluded from additional environmental impact screening via the EISC Decision Letter issued March 27, 2023.

Summary of the 2021 and 2022 Activities

The 2021 and 2022 Site activities consisted of the following:

- mobilized and demobilized barge camp and equipment to and from the Site;
- completed daily wildlife sweeps;
- excavated 205 test pits and advanced three hand auger holes on the Site to a depth of 1.5 metres below ground surface (mbgs), or to depth of permafrost;
- advanced 70 boreholes to a maximum depth of 4.5 mbgs and completed eight of the boreholes as monitoring wells;
- collected soil samples from the test pits, hand auger holes and boreholes and submitted select soil samples for laboratory analysis of petroleum hydrocarbons (PHC), polycyclic aromatic hydrocarbons (PAH), metals, sulphate and/or nitrate;
- collected two samples from a wood pile (consisting of former wood pilings) and analyzed for PHC, PAH, polychlorinated biphenyl and select metals;
- collected two soil samples from above and beneath polyurethane foam (found on-site) and analyzed for PHC, volatile organic compounds and/or metals;
- submitted one polyurethane foam and one fibreglass sample (from debris found on-site) for analysis of asbestos;
- completed two rounds of groundwater monitoring and sampling from monitoring wells and submitted groundwater samples for laboratory analysis of PHC, PAH, dissolved metals and/or salinity parameters;
- collected surface water samples from a pond off-site and background locations for analysis of PHC, PAH, total metals, salinity parameters and dissolved organic carbon;
- collected global positioning system (GPS) locations of test pit, hand auger, borehole, wood piling and existing monitoring well locations and elevations;
- completed a habitat assessment; and
- staged two fuel trucks containing 18,200 litres (L) each of Jet A-1 Fuel for refuelling a helicopter.

Analytical results from the sampling described above were compared to the following selected guidelines:

- Government of Northwest Territories Guideline for Contaminated Site Remediation soil guidelines;
- Abandoned Military Sites Remediation soil guidelines;
- Canadian Council of Ministers of the Environment soil and surface water quality guidelines;
- Alberta Soil Remediation Guidelines for Barite;

- Alberta Environmental Quality Guidelines for Surface Waters; and
- Federal Contaminated Sites Action Plan Groundwater Quality Guidelines for Federal Contaminated Sites.

Summary of the 2021 and 2022 results:

- The 2021 and 2022 investigation confirmed impacted soil is still present on the Site following the remediation efforts completed up until 2019. Due to the grid sampling approach used, the extents of the impacts are generally well defined on the Site and off-lease but are not yet fully defined.
- Soil PHC concentrations were greater than the selected guidelines from sample locations across the Site and some off-lease locations. Soil naphthalene concentrations were greater than the selected guidelines from sample locations in the former burn pit and former access road. Soil metal concentrations were greater than the selected guidelines from sample locations in the former burn pit, former access road and an off-lease location east of the Site.
- PHC impacts in soil were not horizontally delineated to the north, east or southeast. PHC impacts extend to permafrost. Naphthalene and metal impacts in soil were not horizontally delineated to the east.
- Groundwater naphthalene, salinity and/or metal concentrations were greater than the selected guidelines from two locations (former burn pit and south of Site boundary). Naphthalene impacts in groundwater are not delineated.
- Concentrations of total metals from surface water samples are consistent with background conditions.
- One wood pile sample exceeded the applied soil guideline for PHC and naphthalene.
- Asbestos was not identified in the fibreglass and polyurethane foam samples.
- Off-lease PHC impacts were observed; they may be naturally occurring (i.e., biogenic origin), however additional field sampling and laboratory analysis must be completed to confirm.

Objective for the 2023 Summer Program

The objective for the 2023 summer program is to close the remaining data gaps and facilitate future remediation planning. The work will include:

- assessing the lease area for remaining debris;
- removal of remaining buried debris from lease area including, but not limited to:
  - fibreglass, polyurethane foam, electrical and other debris (straw, steel mesh, plastic) from the tank farm berm along the northern perimeter of the Site and a small area in the central portion of the Site;
  - polyurethane foam exposed in the top of bank, at a depth of about 1 metre (m) below Site grade, along the southwestern perimeter of the Site; and
  - wood pilings from the former camp area in the western portion of the gravel pad.
- horizontal delineation and vertical investigation of PHC, PAH, salinity and metals in soil; and
- groundwater sampling to re-assess PHC, PAH, salinity and dissolved metals at existing monitoring wells.

Summary of the 2023 Scope of Work

The 2023 summer assessment program will include:

- mobilizing a barge camp with equipment to Site for the duration of the project;
- removal of previously identified buried debris from:
  - The berm along the northern perimeter and central portion of the Site (Figure 2): vegetation (i.e. brush), surficial soil and/or gravel will be peeled away and stockpiled using an excavator, buried debris (i.e., fibreglass, polyurethane foam, electrical and other debris [straw, steel mesh, plastic]) will be removed using the excavator and packaged by hand in lined soil bags, and the stockpiled surficial material will be placed back where it came from using the excavator, and if possible, covered with removed vegetation. The extent of buried debris removal from the berm is anticipated to be from the edge of the berm to the lease boundary, a distance of approximately 15 m.
  - The top of bank along the southwestern perimeter of the Site (Figure 2): vegetation (i.e. brush), surficial soil and/or gravel will be peeled away and stockpiled using an excavator, buried debris (i.e., polyurethane foam) will be removed using the excavator and packaged by hand in lined soil bags, and surficial material will be placed back where it came from using the excavator, benched or sloped and covered in coconut matting to mitigate soil erosion and promote natural re-vegetation. The work along the top of the bank will be conducted under the guidance of an on-site geotechnical engineer to ensure slope stability during and after debris removal. Coconut matting and silt fencing, strengthened with steel poles and snow fencing to contain larger material (i.e. rocks), will be available onsite to mitigate the potential movement of sediment down the slope towards the river. The extent of foam removal from the bank is anticipated to be between the exposed face of the bank and the former 2018 remediation boundary, a distance of approximately 10 m.
  - Wood pilings from the former camp area: 24 wood pilings identified in 2021 will be removed using the excavator by digging to a depth of approximately 5 mbgs. Wood and soil samples will be collected for laboratory analyses of benzene, toluene, ethylbenzene, xylenes (BTEX), PHC Fractions F1 to F4, PAH, phenols, cresols and metals. Soils excavated with the pilings will be returned to the holes in reverse order they are excavated and compacted with the excavator bucket.
  - The removed buried debris (i.e., collected in lined soil bags and the excavated wood pilings) will either be removed from the Site on the barge at the end of the 2023 summer program for disposal at a licensed facility or temporarily stored on-site adjacent to the emergency shelter, in secondary containment, and weighed down if necessary (i.e., with wood) for future off-site removal and disposal at a licensed facility in 2024. Waste will be disposed of appropriately as outlined in the Waste Management Plan (Appendix A).
- advancing approximately 21 boreholes, on- and off-lease (to the north and east), to a maximum depth of 2.5 mbgs;
- boreholes will be advanced using a Mobile Augers M5T™ portable drill rig (same or equivalent to equipment used in 2022), except for select sample locations which will be obtained using hand augers; the lease area is previously disturbed and filled in, no vegetation will be disturbed to advance the boreholes on the lease; minimal vegetation brushing may occur to advance the off-lease locations;

- collecting soil samples from the boreholes and submitting select soil samples for laboratory analysis of BTEX, PHC fractions F1 to F4, PAH, salinity and/or metals;
- collecting GPS locations of borehole locations;
- completing one round of monitoring and collecting groundwater samples from existing monitoring wells and submitting select groundwater samples for laboratory analysis of BTEX, PHC Fractions F1 to F2, PAHs, metals and/or sulphate;
- installing two thermistors (one in the background area and one within the Site footprint) for temperature profiling and permafrost depth determination;
- completing a slope survey along the south end of the Site;
- assessing the off-site dock for future removal;
- staging one double-walled fuel truck containing 2,000 litres (L) of diesel for refueling equipment (i.e. loader, excavator, pick-up truck etc.) including drip trays and spill kits as per the Spill Contingency Plan (Appendix 1); and
- staging up to two double-walled, single-compartment, fuel trucks containing 18,200 L each, inculding drip trays and spill kits as per the Spill Contingency Plan (Appendix 1), for refuelling a helicopter at Camp Farewell twice a day from mid-June to September 30, 2023, and using the helicopter to access Shell wellsites in the region for the purpose of completing soil and water sampling (Phase II Environmental Site Assessments under EISC registry file 02-22-03). Alternatively, one 61,000 L double-walled Jet A-1 Enviro-Tank containing 36,400 L of Jet A-1 fuel, a portable ATCO trialer (for shelter during helicopter re-fueling), pump and generator (i.e. a light tower), will be used instead of the fuel trucks. The empty Enviro-Tank will be mobilized to the Site on a barge and filled on-site using two fuel trucks containing 18,200 L of Jet A-1, each. The empty fuel trucks will then be demobilized from Site.

The self-contained barge camp will include water and sewage tanks mobilized from and back to Inuvik for disposal at the end of the project. Camp use of provided water will not exceed a volume of 50 cubic metres per day. Potable water will be brought to Site on the barge, no water withdrawal or deposit of wastewater will occur at the Site.

Regulatory Requirements

The regulatory requirements for the 2023 summer program are presented in Table A.

Table A: Regulatory Requirements

Requirement	Status
EISC Environmental Impact Screening	Amendments to EISC Registry File [05-18-01] were applied for the summer 2021 and 2022 projects and were excluded from additional environmental impact screening via EISC Decision Letters issued June 28, 2021 and July 18, 2022. An amendment to EISC Registry File [05-18-01] for the 2023 summer program was applied for by WSP/Shell on March 16, 2023 and was approved via the EISC Decision Letter issued March 27, 2023.
Community Consultation and Engagement	Consultations with Inuvialuit communities are ongoing and will continue in 2023. Letters detailing the work completed in 2022 were provided to the Hunters and Trappers Committee (HTC) members and Community Corporation (CC) members in Inuvik, Aklavik and Tuktoyaktuk in March 2023. Letters explaining the planned work for 2023 were sent to the HTC members and CC members in Inuvik, Aklavik and Tuktoyaktuk in April 2023. Consultations with the Aklavik HTC, CC and Elders Committee were held on February 24, 2023. Shell representatives held in person engagements with representatives of the HTCs and CCs from Aklavik and Tuktoyaktuk the week of March 13, 2023. Additional sessions will be held at the request of the HTC or CCs.
IWB Water Licence	The IWB will be notified of planned activities as part of Water Licence N7L1-1834 (expires July 17, 2029).
Department of Lands Lease (now Department of Environment and Climate Change [ECC])	The ECC has being notified of planned activities as part of the existing Land Lease for Camp Farewell (107C/04-002) which will expire December 31, 2028.
Canadian Wildlife Service Migratory Bird Sanctuary Permit	The existing Migratory Bird Sanctuary Permit (MM-NR-2021-NT-004.A1) will expire on December 31, 2023. An amendment request has been submitted to seek approval for additional work for 2023.
Fisheries and Oceans Canada (DFO) Authorization	A request to review was submitted to DFO to review the removal of polyurethane foam from the top of bank along the southwestern perimeter of the Site. DFO concluded that the work will not require an authorization under the *Fisheries Act* or the *Species at Risk Act* on May 5, 2023.

Shell will adhere to the conditions provided by the EISC and the IWB in their previous approvals and will implement all mitigation measures committed to in the original submissions.

Project Timeline

The project schedule for the 2023 summer program is presented in Table B. The on-site fieldwork is expected to take approximately two weeks in August to September and the fuel truck or fuel tank staging for helicopter re-fueling will take place from mid-June to September. The additional assessment data collected in 2023 will be used to complete a Remedial Action Plan to guide the Site remediation anticipated to start in 2024. A Project Description (PD) for the future remediation program will be submitted to the EISC prior to that program.

Table B: 2023 Project Schedule

Project Activity	Estimated Time Frame
Applications and permitting	January to June 2023
Community consultation and engagement	Ongoing
Logistics planning	March to June 2023
Fuel truck or fuel tank staging and helicopter refuelling	June to September 2023
Field program	August to September 2023
Reporting	September 2023 to February 2024

Camp Farewell is within the Kendall Island Bird Sanctuary and other sensitive areas as identified in the Community Conservation Plans for Aklavik, Inuvik and Tuktoyaktuk (AICCP 2016; ICCP 2016; TCCP 2016). The 2023 summer program may overlap with traditional harvesting times for some bird, fish and terrestrial species. Shell has committed to notify the HTCs of the timing of the program prior to mobilization to reduce interactions and/or disturbance to traditional harvesting. Waterfowl and shorebird species are expected to be nesting and select mammal and fish species may be undergoing sensitive life history events during the summer program (IEG 2018). Mitigation measures, as outlined in the 2018 PD (IEG 2018), EISC Registry File [05-18-01] approval and subsequent amendments will be implemented to address potential negative impacts on the environment, wildlife and resource harvesting. Minimal vegetation disturbance is anticipated during the drilling of off-lease boreholes and removal of the buried debris from the berm and top of the bank. The drilling methods selected for the 2023 summer program are anticipated to minimize disturbance to existing vegetation. Noise generating activities (i.e., brush clearing, drilling) will be intermittent and of short duration during the day.

Personnel and Equipment Requirements

During the 2023 summer program, local businesses and community members will have the opportunity to supply goods and services. The personnel and equipment list for the 2023 summer program are presented in Tables C and D.

Table C: 2023 Project Personnel

Personnel	Number Required
Site Supervisor	1
Environmental scientist	2
Camp/barge master	1
Surveyor	1
Medic	1
Boat operator	1
Equipment Operator	1
Drilling crew	2

Personnel	Number Required
Inuvialuit Wildlife Monitor	2
Mechanic	1
Catering personnel	1
Housekeeping personnel	1
Labourers (debris removal and other site jobs)	6 to 8

Table D: 2023 Equipment List

Equipment	Number Required
Transport boat	1
Mobile Augers M5T™ portable drill rig (same or equivalent to equipment used in 2022)	1
Fuel truck (diesel)	1
Fuel truck (Jet A-1) OR Fuel Tank (Jet A-1)	2 OR 1
ATCO Trailer	1
Generator (i.e. light stand)	1
Pick-up truck	3
All-terrain vehicle (ATV) or utility task vehicle (UTV)	1
Loader (IT 28, same or equivalent to equipment used in 2022)	1
Excavator (similar to Cat 329 or Hitachi 200 Series)	1
Garmin In-Reach™ hand-held GPS	2
Spill kits, spill trays, secondary containment for temporary storage of lined soil bags and wood pilings	3
Satellite phone	3
Satellite internet system	1
First aid kit and eye wash station	2
Barge camp	1
Miscellaneous environmental field equipment	1
Monitoring well installation and decommissioning supplies	1
Garbage bin (wildlife proof)	1

Reporting

The updated Emergency Response Plan, Spill Contingency Plan and the Waste Management are provided in Appendix A.

An annual report detailing the results of the 2023 activities at Camp Farewell will be submitted to the GNWT ECC, the CWS (in accordance with the permit [due by December 31, 2023]), and the IWB (in accordance with the Water Licence N7L1-1834 [due by March 31, 2024]). A letter detailing the results of the 2023 activities will also be sent to the HTCs and CCs in Inuvik, Aklavik and Tuktoyaktuk.

CLOSURE

We trust the information provided herein meets your requirements. If you have any questions about the contents of this letter, please contact the undersigned, or Kyle Thompson (1-403-691-3174 ex. 3174; Kyle.Thompson@shell.com) at your convenience.

Yours truly,

WSP Canada Inc.

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PC/PK/sh

Attachments: Figures
References
Appendix A – Emergency Response Plan, Spill Contingency Plan, Waste Management Plan

REFERENCES

Literature Cited

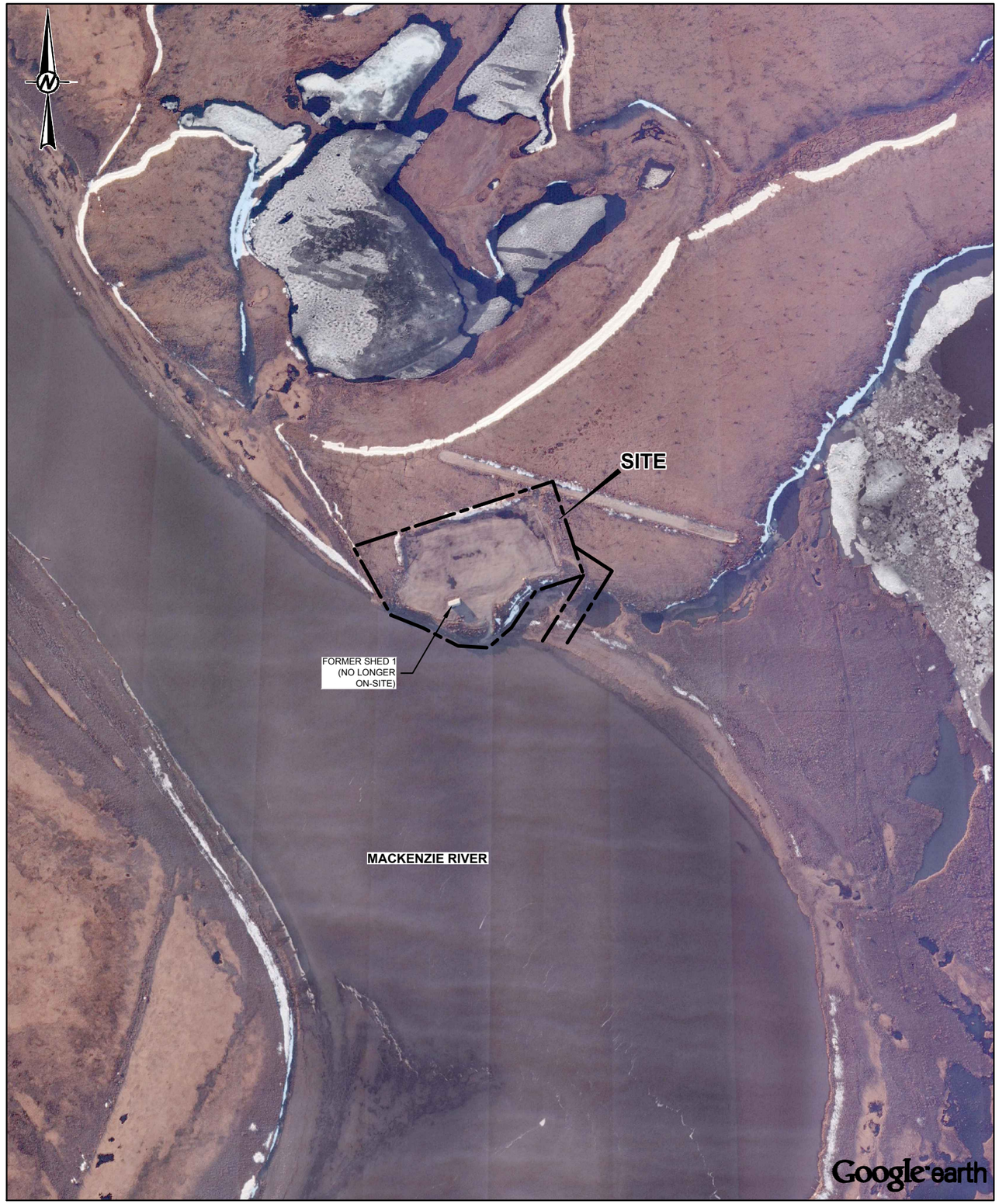
AICCP (Aklavik Inuvialuit Community Conservation Plan, Akaqvikmiut Nunamikini Nunutailivikautinich). 2016. Prepared by the Aklavic Hunters and Trappers Committee, Aklavik Community Corporation, The Wildlife Management Advisory Council (NWT), The Fisheries Joint Management Committee and the Joint Secretariat. Inuvik, 2016.refs

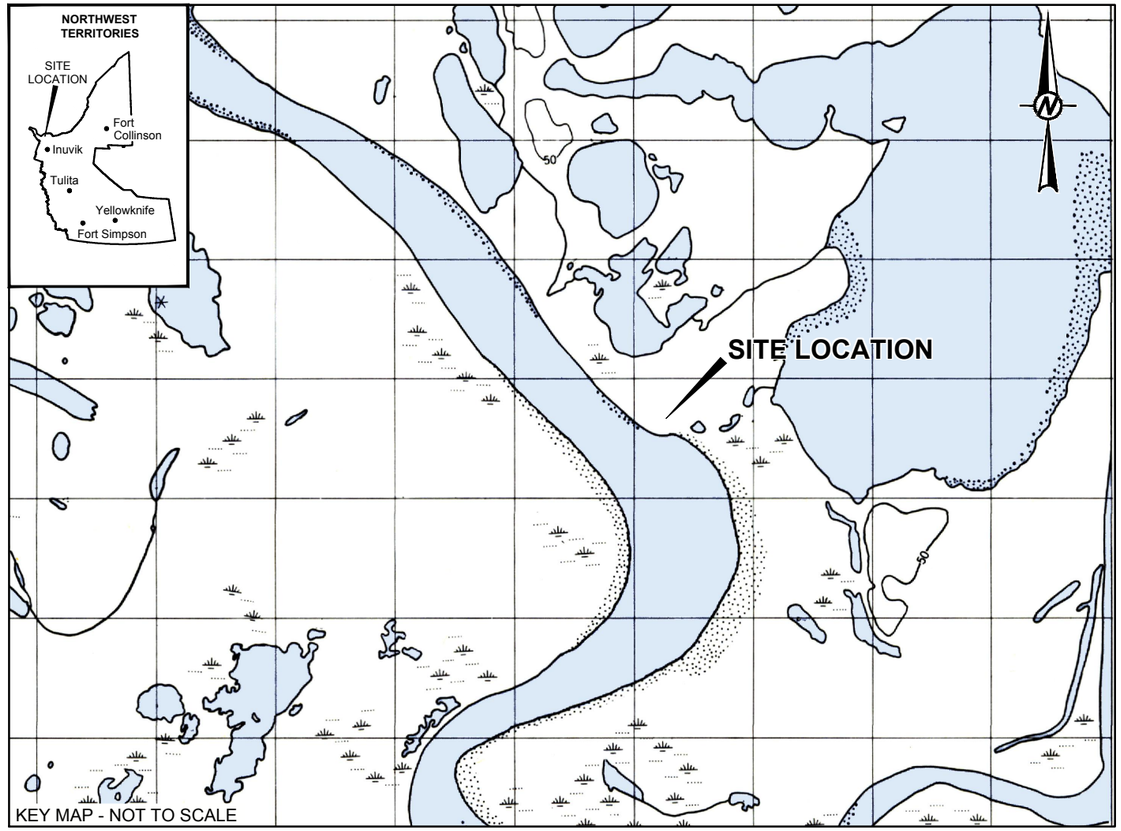
ICCP (Inuvik Community Conservation Plan, Inuuvium Angalatchivingit Niryutinik). 2016. Prepared by the Inuvik Hunters and Trappers Committee, Inuvik Community Corporation, The Wildlife Management Advisory Council (NWT), The Fisheries Joint Management Committee and the Joint Secretariat. Inuvik, 2016.

IEG. 2018. Shell Canada Energy – Camp Farewell – Project Description for 2018 Remediation Program. April 2018.

TCCP (Tuktoyaktuk Community Conservation Plan, Tuktuuyaqtuum Angalatchivingit Niryutinik). 2016. Prepared by the Tuktoyaktuk Hunters and Trappers Committee, Tuktoyaktuk Community Corporation, The Wildlife Management Advisory Council (NWT), The Fisheries Joint Management Committee and the Joint Secretariat. Inuvik, 2016.

FIGURES





LEGEND

PROPERTY BOUNDARY

REFERENCE

ORIGINAL DRAWING OBTAINED FROM INUKSHUK GEOMATICS INC..; DWG No.: 35136_Shellfarewell_Golder-130901; SCALE: 1:750; DATE: SEPTEMBER 1, 2021.

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TOPOGRAPHIC MAP 107C/4E OBTAINED FROM Canmatrix. © 1958 THE ARMY SURVEY ESTABLISHMENT, R.C.E. PROJECTION: TRANSVERSE MERCATOR; DATUM: NAD27; COORDINATE SYSTEM: UTM ZONE 8.

0 250 500
(APPROX.) METRES

CLIENT
SHELL CANADA LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2023-02-08
DESIGNED	CMcLean
PREPARED	LMoraes
REVIEWED	ABellavance
APPROVED	LHaderlein

PROJECT
CAMP FAREWELL
INUVIALUIT SETTLEMENT REGION, NORTHWEST TERRITORIES

TITLE
SITE LOCATION PLAN

PROJECT NO.	PHASE-TASK	REV.	FIGURE
22525414	1200-1201	0	1

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

Figure 2: Camp Farewell Site Plan

APPENDIX A

Appendix A – Emergency Response Plan, Spill Contingency Plan, Waste Management Plan

REPORT

Emergency Response Plan

2023 Environmental Site Assessment - West Channel and Camp Farewell

Submitted to:

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Submitted by:

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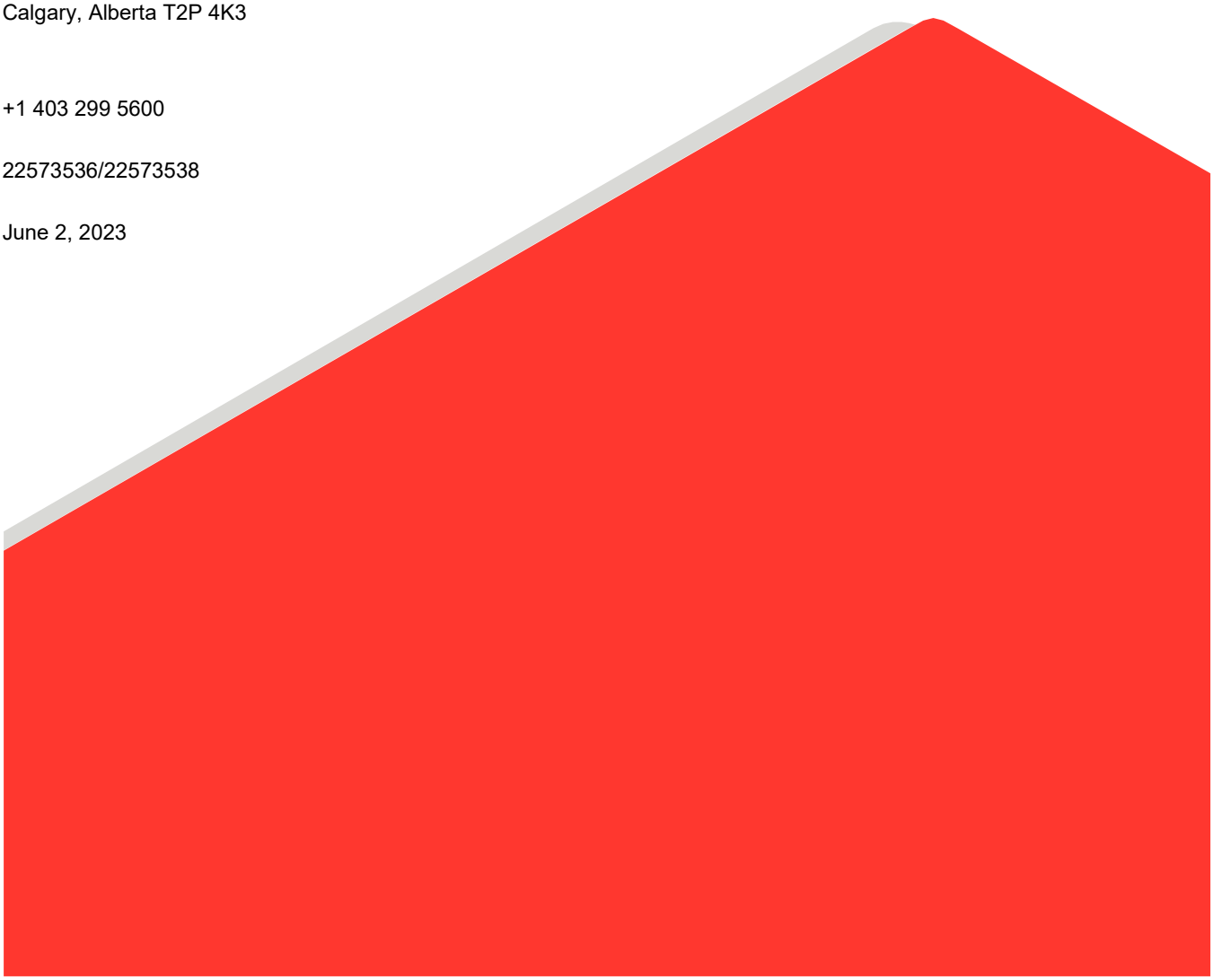
22573536/22573538

June 2, 2023



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APPENDIX A
Crisis Management – Silver Plan

1.0 EMERGENCY RESPONSE PLAN OBJECTIVE

The purpose of this Emergency Response Plan (ERP) is to:

- Provide all project staff (including subcontractors) with a list of identified potential emergencies for the 2023 field program at
  - West Channel at 68° 28'3 3.00" N latitude and 135° 33' 25.00" W longitude; and
  - Camp Farewell at 69° 12' 30.0" N latitude and 135° 06' 04.4" W longitude.
- Assist the project team in determining appropriate responses to potential emergency situations.
- Provide the project team with established procedures and guidelines for emergency response.
- Provide the project team with the tools needed to facilitate a quick and effective response to an emergency.
- Provide emergency response flowcharts and contact information to facilitate a quick and efficient response/evacuation if required.

It is designed to preserve the safety of the crew, minimize the impact of emergencies to environment, property, equipment, and processes, and to restore normal operations as efficiently as possible.

1.1 Emergency Event

An emergency is any event that requires an immediate response to avert damage or threats to:

- The health and safety of our employees and/or our sub-contractors and visitors to the Site.
- The environment.
- The property or equipment.
- The reputation of our company and client.

If an emergency occurs during the project, personnel involved must take the appropriate immediate action to protect their own personal safety, the safety of any other people involved and of the environment.

2.0 EMERGENCY RESPONSE TEAM RESPONSIBILITIES

2.1 Site Superintendent

The Site Superintendent ensures that all personnel on-site know and understand their responsibilities in the event of an emergency on-site as outlined within this plan. They establish the muster points on the Site. The role and responsibilities of the Site Superintendent includes, but not limited to the following:

- They are the primary contact for all personnel to report on-site emergencies. They will immediately assess the emergency and ensure that all emergency response procedures are followed according to the plan.
- They will ensure all personnel are made aware of the emergency and will ensure when an injury has occurred that the injured party receives immediate and appropriate care required for their injury.
- They will communicate all incidents as soon as possible to the WSP Project Manager (PM).
- They will liaise with the Site Medic to arrange for off-site medical assistance, if required.

- They will lead the investigation process of all incidents.
- They will lead planned emergency response drills and debrief sessions.
- They will ensure this plan is updated as appropriate and any changes are communicated to on-site personnel.

2.2 Site Medic

The Site Medic is responsible for inspecting and maintaining first aid equipment and supplies and ensuring adequate number of first aid kits for the number of personnel present at the Site. The Site Medic will provide injury/illness response and immediate care for an injured / ill worker. The Medic will assess and determine if an injured/ill person can be safely treated on-site or requires emergency evacuation (boat or air evac) from Site. The Medic and Site Superintendent will coordinate emergency response actions with off-site medical facilities and air ambulance if necessary. The Site Medic will document all injuries and illnesses in a confidential first aid log which will be kept on-site and initiate care management. Complete Alcohol and Drugs testing will be performed by an approved laboratory in Yellowknife, Northwest Territories.

2.3 On-Site Personnel

All personnel are expected to promptly report all incidents and fit for duty concerns to the Site Superintendent who will ensure the ERP is followed. Personnel are expected to know and understand how to respond in an emergency as per this plan. All personnel must participate in planned emergency response drills. Any medical conditions that could jeopardize the health and well-being of personnel on-site should be disclosed to the Site Medic prior to starting work such as allergies including stinging insects, prescription medication, fatigue, etc.

3.0 SITE EMERGENCY NOTIFICATION AND COMMUNICATION

In the event of an emergency (medical and non-medical), the actions initiated by workers shall follow the procedures established in this ERP. Once all immediate actions have been taken to protect life, health and safety of workers, the emergency notification and communication protocol will be followed. The emergency notification and communication flowchart are included in Figure 1.

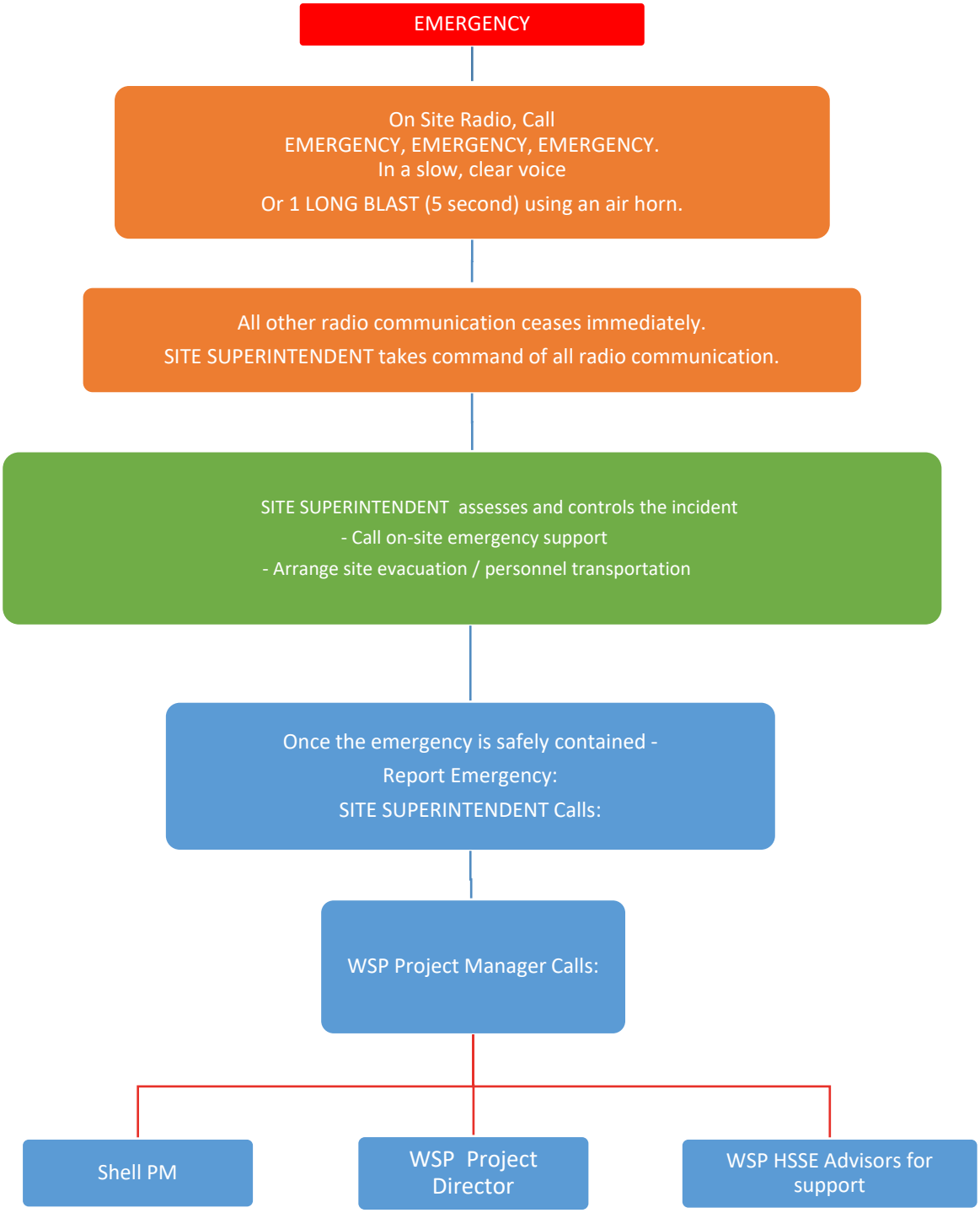
Two-way radios will be used as the primary source of communication while on-site between crew members. Satellite Phones will be the primary source for external communication as there is no cell reception on-site. Additionally, there will be a backup Satellite phone and Satellite based emergency communication devices (inReach). All injuries, illnesses, and other incidents (e.g., near losses) will be reported to the Site Superintendent as soon as possible. All injuries and incidents will be documented and investigated as soon as practical. Investigations will be led by the Site Superintendent. The Shell Project Manager must first be notified by the WSP Project Manager of all incidents following the matrix below (Table 1).

Table 1: On-Site Incident Communication and Reporting Matrix

Incident type	Monday to Friday	Weekends and Holidays
■ Near Loss ■ Security (theft, trespassing, vandalism) ■ Environmental spill (does not meet regulatory compliance) ■ Property/Equipment Damage ■ Injury No Treatment ■ Injury First Aid	■ Site Superintendent calls WSP PM ■ WSP PM informs WSP PD and WSP HSSE Advisor ■ WSP PM calls Shell PM to report ▪ If no response, leave a voicemail and follow up with an email ▪ Follow-up with call to Shell PM	■ Site Superintendent calls WSP PM ▪ If no response, leave voicemail and follow up with email, cc WSP HSSE Advisor and WSP PD ▪ Call WSP PD ■ WSP PM/PD to call Shell PM to report ▪ If no response, leave voicemail and follow up with email ▪ Follow-up with call to Shell PM ■ WSP PM/PD to ensure incident notification escalates the following business day.
■ Loss Medical Treatment ■ Environmental Spill (regulatory non-compliance) ■ Discharge of Firearm ■ Missing Person ■ Fire/Explosion ■ Site Evacuation	■ Site Superintendent calls WSP PM ■ WSP PM informs WSP PD and WSP HSSE Advisor ■ WSP PM calls Shell PM to report ▪ If no response, leave a voicemail and follow up with an email and subsequent call on the following day ▪ Follow-up with call to Shell PM.	

Notes:
HSSE – health, safety, security and environment
PD – project director
PM – project manager

Figure 1: Emergency Notification and Communication Flowchart



3.1 Emergency Contact List

West Channel Site Location: (68° 28' 3.00" N latitude and 135° 33' 25.00" W longitude)

Camp Farewell Site Location: (69° 12' 30.00" N latitude and 135° 06' 4.40" W longitude)

Emergency Contacts	Number
Inuvik Hospital	(867) 777-8000
Inuvik RCMP	(867) 777-1111
Inuvik Fire – Emergency Line	(867) 777-2222
Inuvik Fire – General Inquiries	(867) 777-8611
Canadian Coast Guard Search and Rescue (24 hr)[a]	(800) 267-7270
Canadian Coast Central Regional Headquarters	(855) 209-1976 or *16 on a cell phone
Inuvik Public Health Centre	(867) 777-7246
NT Spill Reporting Line (24 hr)	(867) 920-8130
Environment and Climate Change – Regional Office	(867) 678-8091 ext. 53661
Wildlife Emergencies (24 hr)	(867) 678-0289
To Report a Wildfire (24 hr)	(877) 698-3473
Work Care (consultation for work related injuries/illnesses for WSP)	(833) 977-8001
NT WSCC Incident & Injury Reporting Line	(800) 661-0792
Poison Control Centre	(800) 332-1414

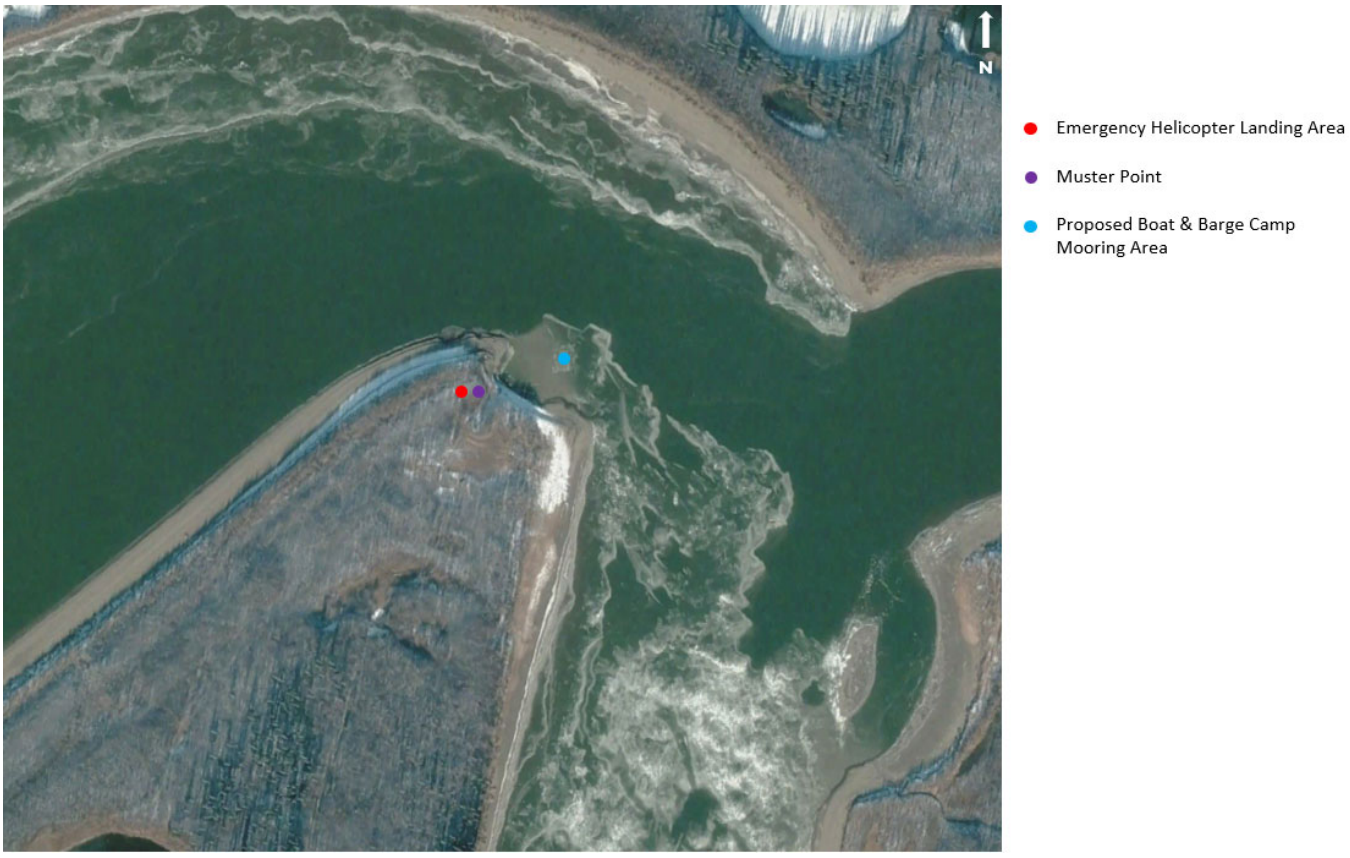
WSP Emergency Contacts	Name	Number
Site Superintendent	Todd Bonin Lisa Switzer	Cell: (403) 299-5600 Satellite/InReach: TBD Cell: (226) 376-2812 Satellite/InReach: TBD StarLink: TBD
Lead Field Technicians	Rebecca O'Brien Justin Jackson	Cell: (780) 686-8236 Cell: (780) 218-5209
Project Manager	Punchalee Clair	Cell: (902) 221-6875
Project Director	Patrick Kalita	Cell: (780) 239-1420
HSSE Advisor Lead	Lisa Switzer	Cell: (226) 376-2812
HSSE Advisor Alternate	Darren Nippers	Cell: (403) 472-0425
Global Shell Safety Support	Carissa Johnson	Cell: (201) 618 2151
Human Resources	Stephanie Ozowa	Office: (403) 466-6555

Shell Emergency Contacts	Name	Number
Project Manager	Kyle Thompson	Office: (403) 691-3174 ext. 3174 Cell: (403) 801-6438
Shell Aviation	Phil Smith	Cell: (985) 707-7625 Office: (504) 425-4580
Subcontractor Emergency Contacts	**Name**	**Number**
BlackComb Helicopters	Operations	24 contact: 604-938-1700 Operations Officer Cell: 604-317-7622 Aircraft common frequency: TBD
Integrated Sensing & Surveillance	Operations Manager	Direct Line: (403) 550-2984 Aircraft common frequency: TBD
E.G.T Manager	Douglas Saunders	Cell: (867) 678-0045
Crew Boat	EGT	Satellite/InReach: TBD

Note:

a) Canadian Coast Guard Search and Rescue is connected with the Joint Rescue Coordination Centre Trenton and share Communication and Traffic Services radio systems.

3.2 Muster Points and Helicopter Landing Areas



West Chanel Project Site Helicopter landing area Coordinates:

69° 12' 35.0" N latitude and 135° 06' 11.37" W longitude in degrees, minutes, and seconds (DMS)

Camp Farewell Project Site Helicopter landing area Coordinates:

69° 12' 35.0" N latitude and 135° 06' 11.37" W longitude in degrees, minutes, and seconds (DMS)

3.3 WSP Crisis Management Team

A crisis, triggering the activation of the WSP Crisis Management Team (CMT), is any event or circumstance which requires an immediate response and damages or threatens in a material way:

- The health and safety of our employees or other people including sub consultants and contractors.
- The properties/assets of our company; and/or
- The reputation of our company.

3.4 Activation of WSP Crisis Management Team

If a crisis occurs, the incident scene must not be disturbed except so far as is necessary to attend to injured persons, prevent further injuries or death, and protect the environment that is endangered because of the emergency. Follow the documented emergency procedures as outline within this ERP and report the crisis to the PM. The PM is responsible for activating the WSP CMT. If the PM cannot be reached, the on-site Safety Representative will place the call to the Project Director who will activate the WSP CMT. The Crisis Management Silver Plan for WSP is included in Appendix A.

- Once activated, the WSP CMT will:
  - Report: Advise the Gold/Silver/Bronze Team as appropriate

- Assess: Evaluate the impact and severity of the situation and determine the crisis level per the Crisis and Incident Communications Policy.
- Convene: Assemble the most suitable response team for the situation.
- Execute: Contain & manage situation using all available resources.
  - Facts: what do we know?
  - Assumptions: what do we believe?
  - Scenarios: what are best-case, worst-case & likely scenarios?
  - Target objectives: what is our current objective? (e.g., more info, restore power)
  - Response options: what is the best response from the options available?
  - Implementation: what needs to be done now, by who? (e.g., action plan)
  - Stakeholders: prioritize key stakeholders according to interest & influence
  - Key messages: prepare & deliver key messages for priority stakeholders
- Recover: Post-event, conduct a formal review to drive continual improvement

4.0 EMERGENCY RESPONSE REQUIREMENTS

A First Aid Risk Assessment was completed for this project as required by the Northwest Territories (NWT) Occupational Health and Safety Regulations to determine the first aid attendants, supplies and equipment, facilities and transportation required to render prompt and appropriate first aid to worker and to render prompt and appropriate transportation for injured workers to the nearest appropriate medical facility or hospital. As per the regulations, the Site is categorized as high-risk in respect to the type of injuries that could occur at the work Site.

As per Part 5 of the NWT Occupational Health and Safety Regulations, the project must meet these minimum requirements pertaining to First Aid for the Site:

Applicable Schedule	Number of Workers at the Site	Minimum First Aid Kit and First Aid Attendant Level
Schedule D: Minimum First Aid Kit Requirements: High Risk Work Sites	■ 2 to 25 Workers at Site	■ 1 small Type 3 First Aid Kit
Schedule H: Minimum First Aid Attendant Requirements	■ 2 to 10 Workers at Site ■ 11 to 20 Workers at Site	■ 1 Advanced First Aid Attendant ■ 2 Advanced First Aid Attendant

4.1 Training Requirements

All personnel shall receive an orientation on this ERP by the Site Superintendent on their first visit to Site and prior to starting work. All first aid trained personnel will possess a valid First Aid training certificate. All Site personnel will be trained in the use of fire extinguishers and spill response equipment. The training matrix requirement appear in the Site HSSE Management Plan.

4.2 First Aid Stations

A first aid room is identified and established in the on-site accommodations (the Barge). The Site Medic is responsible for operating and maintaining the first aid room and equipment. An additional first aid kit – Level 2 will be on board the transport boat. Other vehicles with first aid kits will be marked with signage and will be communicated to all personnel during site orientation. The first aid kits will contain the minimum first aid requirements including: a manual, a first aid register and emergency contact numbers, and contain supplies and equipment set out in Schedule H of the OHS Regulations. First aid kits will be inspected weekly, and equipment (AED) tested monthly.

In addition to the minimum requirements of Schedule H, each first aid kit location will also have an eye wash station. One automated external defibrillator (AED) will be available for the duration of the project. The primary location of the AED will be in the first aid room.

5.0 GENERAL SITE EVACUATION

In the event of a Site wide emergency, the First Responder will communicate the nature of the emergency via radio.

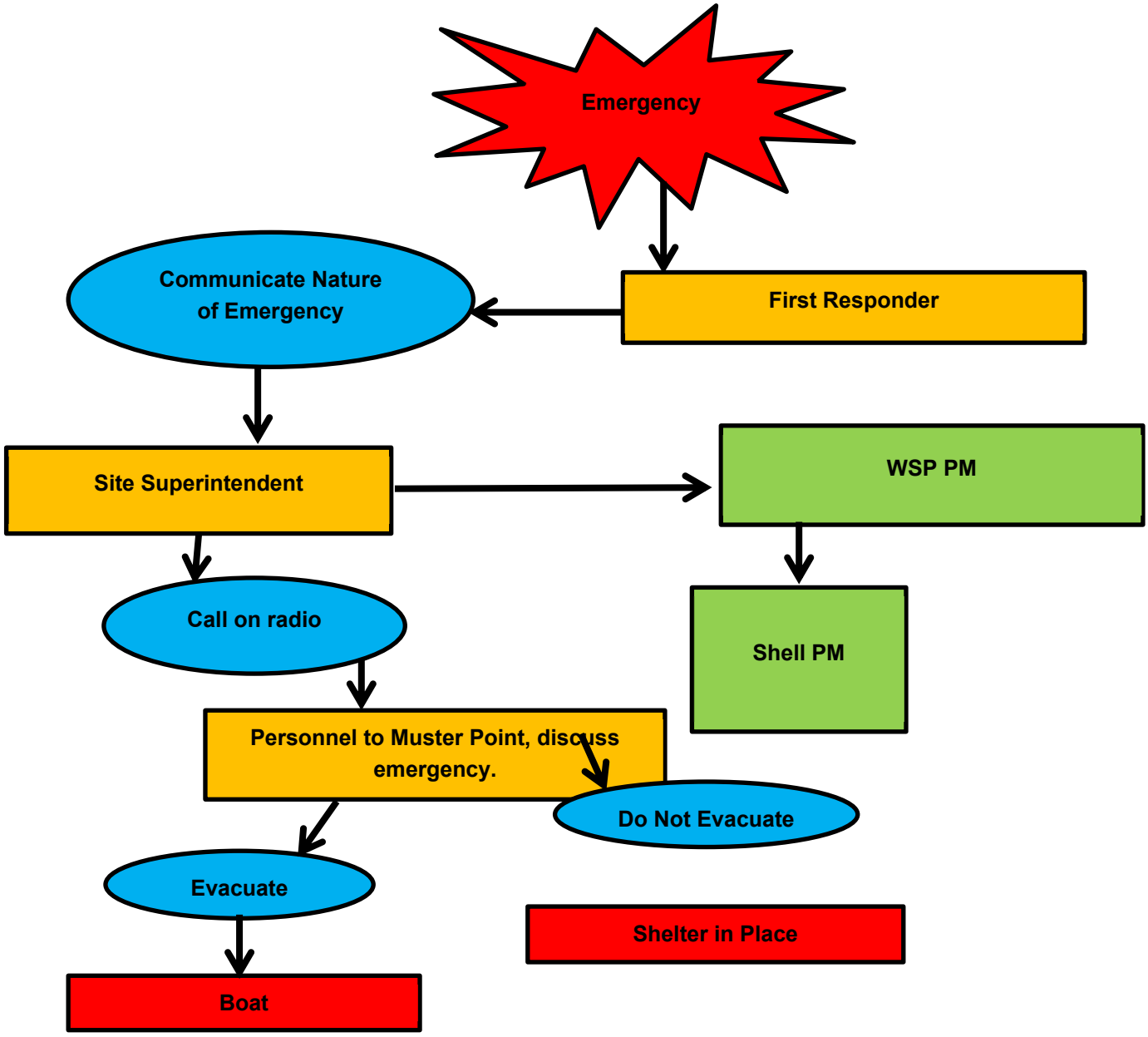
Upon the order to muster:

- All personnel will stop working, shut down and secure equipment.
- All personnel will muster at the Muster Point:
- The Site Superintendent will confirm all personnel are present.
- The Site Superintendent will determine if evacuation from Site or shelter in place is required.
- The Site Superintendent has the authority to order a Site wide evacuation in the event of a catastrophic or potentially catastrophic emergency to protect the health and safety of personnel. All personnel will be evacuated to Inuvik by boat or air (if deemed necessary).

To initiate a Site wide evacuation, the Site Superintendent will call “evacuate, evacuate, evacuate” over the Site radio.

Upon the order to evacuate:

- Each crew will confirm the order with the Site Superintendent via in person or radio communication.
- All personnel will stop working, shut down and leave equipment in place.
- Move to the project evacuation point / muster station.
- Confirm with the Site Superintendent when all crew members are accounted for; and follow instructions from the Site Superintendent for safe evacuation from Site.
- Visitors will be ushered by designated Site personnel to the muster station.



6.0 SITE SPECIFIC EMERGENCY RESPONSE PROCEDURES

The emergency situations with the greatest likelihood of occurring at or near the project Site have been identified and are listed in this section. In addition to the potential emergencies identified, it is recognized that emergencies are often unexpected and can arise at any time. It is the responsibility of the WSP Site Superintendent, in consultation with the Medic, First Aid Attendants and subcontractor site superintendent to assess conditions on a regular basis and adjust plans as new situations are identified. Any changes and/or additions made to the HSSE Plan and this ERP must be communicated to the PM.

6.1 Fire or Explosion

In the event of fire, first responder will attempt to put out a fire using a fire extinguisher if safe to do so; if not, radio for help.

To report a fire in progress:

- Remain calm.
- Sound the alarm / Call “Fire, Fire, Fire” on a radio.
- Evacuate endangered personnel to Muster Point.

Using a fire extinguisher:

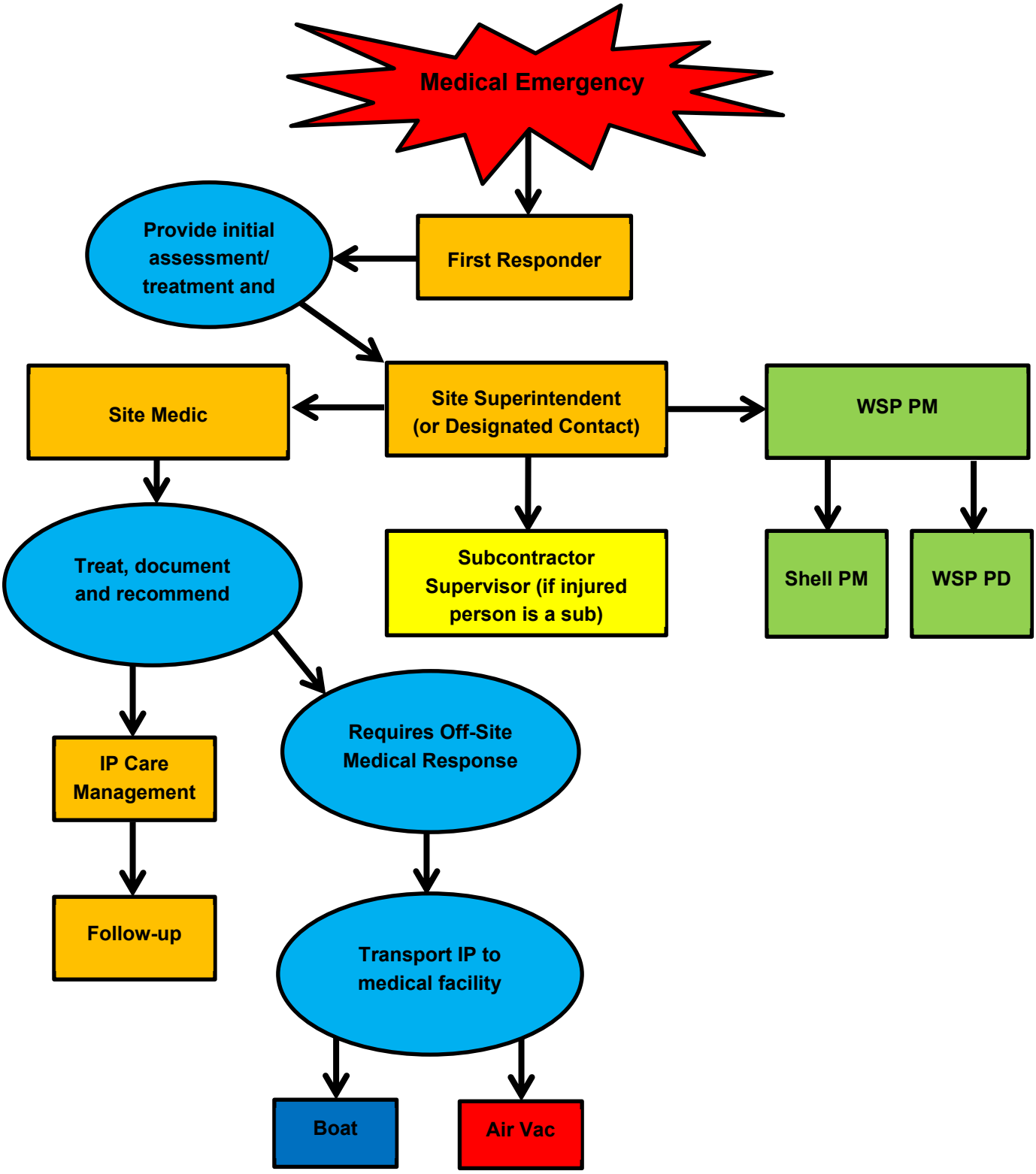
- Before deciding to use a fire extinguisher to fight a fire:
  - Be sure that the fire is small and not spreading.
  - You have the correct type of fire extinguisher for what is burning.
  - Stand several feet from the fire.
- Pull the pin (if necessary, turn the pin to break the zip tie).
- Aim the nozzle at the base of the fire.
- Squeeze the handle slowly.
- Sweep from side to side.
- Drop the fire extinguisher and evacuate if the fire is spreading.

6.2 First Aid and Medical Assistance

All minor injuries or illnesses (small cuts, lacerations, sprains, strains etc.) shall be reported immediately to the Site Superintendent and documented following the injury loss reporting process. The injured person’s condition will be assessed, and appropriate first aid treatment will be applied if/as required. Care management begins the moment a person is injured and concludes when a worker returns to normal condition and duties. The Site Superintendent will lead care management and work with the injured worker to ensure appropriate mitigations are put in place that allow an injured worker to recover. The injured worker’s conditions will be monitored daily following the report of an injury.

In the event of a serious or potentially life-threatening injury/illness:

- Call goes out on the radio in a calm clear voice “MEDICAL, MEDICAL, MEDICAL”.
- All work on-site stops immediately. All crews stand down and maintain radio silence.
- Site Superintendent or alternate takes immediate and sole control of the emergency via radio.
- Medic at the Site responds immediately, mobilizes first aid equipment, and responds to the injured person (IP)
- On-site workers will assist with affected person(s) carry/move/transport in case it is required.
- Site Medic and Site Superintendent will determine the best option for transporting the IP to the hospital/health centre.
- Site Superintendent to call health care center and determine the appropriate transportation method based on the condition of the affected person(s) when assistance beyond on-site capabilities is required.
- Site Superintendent or designated WSP employee shall accompany an IP to the hospital/health centre.


Medical Emergency
First Responder
Provide initial assessment/ treatment and
Site Medic
Site Superintendent (or Designated Contact)
WSP PM
Treat, document and recommend
Subcontractor Supervisor (if injured person is a sub)
Shell PM
WSP PD
IP Care Management
Requires Off-Site Medical Response
Follow-up
Transport IP to medical facility
Boat
Air Vac

6.3 Missing Crew Member

All personnel will be accounted for at the start and end of the workday. If a worker goes missing, a thorough search of the site will be conducted immediately. If the person cannot be safely located, the Site Superintendent will make an emergency call to the RCMP and report a missing person.

6.4 Person Overboard Emergency

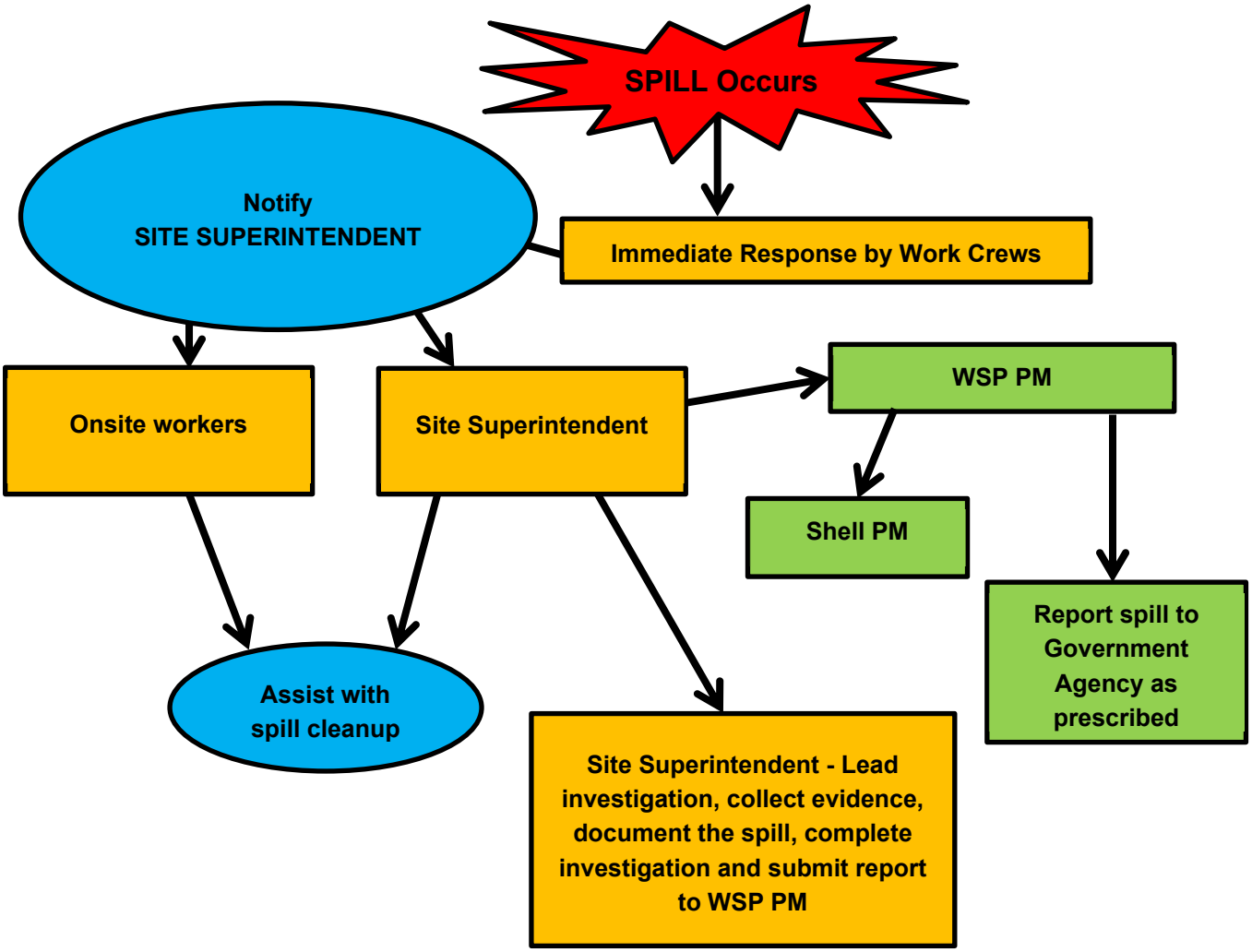
How to respond in the event a person falls overboard from a boat:

- Remain calm.
- Affix the location and maintain visual contact of the victim's location.
- Throw a lifeline e.g., life ring and rope.
- Recover the person overboard and treat them for cold stress.

6.5 Environmental Spill Response Procedures

If there is an environmental release, take the following steps:

- Stop work.
- Ensure safety of all personnel in the work area.
- Identify the material released.
- Contain the spill (using spill kits), stop the flow and control hazards by eliminating all ignition sources, define safety parameters by setting up cones and barricades if needed.
- Report spill to Site Superintendent. The Site Superintendent will report the spill, status, and any injuries to the WSP PM.
- Monitor the air at the perimeter of the flagged off area, as necessary.
- Clean up the released material to the extent possible. Waste and cleanup materials will be removed from Site at the earliest opportunity.
- Assess and remediate any suspected residual impacts.
- Create a GPS waypoint of spill location.
- The Site Superintendent documents the spill. Gathers photos/drawings and evidence for investigation of the incident. Record time and date that it occurred, record type of chemical released, record environment that the spill occurred (water, land air), record size (amount released, area effected) and equipment involved.
- The PM will report to the Shell PM and to the government agency.



6.6 Communication System Interruptions

The main method of communication on-site will be by using two-way handheld radios operating on the same channel for all crews. Interference is not expected to affect two-way radio usage at the Site. Radios are to be charged each day and communication checks to be tested each morning. Defective or broken radios are to be taken out of service, tagged, and replaced. Satellite phones and inReach devices necessary for external communication will be tested before work starts on-site and service verified each day. Should all communication systems fail, this would result in the immediate stoppage of work until communication services are restored.

6.7 Severe Weather

Weather in the region can change very drastically in a short amount of time. When working during periods where rapid weather changes or inclement weather may be expected, make sure that workers are appropriately equipped with winter or rain gear, warm clothing and a change of clothing as appropriate. All travel related decisions will be made by the Site Superintendent.

- The Site Superintendent or designate alternate will obtain frequent weather updates throughout the workday and communicate changes so that crews may be prepared to modify or suspend work when bad weather doesn't allow it to be completed safely.
- High winds are common for the region, conditions will be assessed by the Site Superintendent.
- If forecasted bad weather requires the evacuation of workers from the work area, the Site Superintendent will coordinate the safe mobilization of the field crew back to safety.
- If weather in the area may prevent emergency evacuation of an injured person, the Site Superintendent, with the consultation of the subcontractor and the project management team may decide to suspend high risk work activities until the weather passes.

The Site Superintendent will communicate weather and potential evacuation status with the crew and, considering the weather forecast, time of day and activities taking place (in terms of risk), one of the following decisions will be made:

- Continue work as normal.
- Suspend high hazard activities and wait for weather to improve.
- Suspend all activities and evacuate the work Site.

6.8 Wildlife Encounter

If wildlife is observed, report sighting immediately to the Wildlife Monitor so they can determine threat level and response. If a Wildlife is observed, take the following steps:

- Stop Work.
- Work crew to leave work area, muster and follow the Wildlife Monitors instructions.
- Confirm with Wildlife Monitor when safe to return to area.

All bear-conflicts are to be reported to the local Environment and Climate Change office. Report a wildlife-conflict: Phone: (867) 678-0289.

Refer to the Wildlife Encounter and Armed Monitor Management Plan 2023 (Appendix D of the HSSE Plan) for further reporting requirements once the Wildlife Monitor confirms the encounter has been appropriately managed.

6.9 Workplace Harassment and Violence

Strategies for recognizing and dealing with incidents of harassment and violence in the workplace are outlined within WSP's Harassment and Violence in the Workplace Policy. Acts of harassment and violence are defined within this policy. If personnel encounter aggressive behaviour by another individual, they are to:

- Remain calm.
- Monitor their own non-verbal cues.
- Maintain a safe distance from the aggressor and identify your escape route to safe area.
- Do not make threats or promises.

- Remove themselves from the situation immediately.
- If the situation escalates, call for help using radio or verbally.
- Contact the Site Superintendent when safe to do so and file an incident report.

The Site Superintendent will report the incident to the PM and involve the WSP HSSE Advisor and human resources representative. The incident may be reported to the local authorities depending on the nature of the aggressive act, and arrangements will be made to have the person(s) responsible for the aggressive act to be immediately escorted and permanently removed from the Site.

7.0 HOSPITAL ADDRESSES

Hospital Name	Address	Phone	Level of Care Available
Inuvik Regional Hospital	285-289 MacKenzie Rd, NT	867-777-8000	ER 24/7 / Full Care

The closest hospital is the Inuvik Regional Hospital. Transportation from Site to the hospital will be completed via Helicopter.

Signature Page

WSP Canada Inc.

Punchalee Clair
Project Manager

Patrick Kalita, B.Sc.
Project Director

APPENDIX A

Crisis Management – Silver Plan

Crisis Management – Silver Plan for WSP Canada

Introduction – WSP makes every effort to ensure that our people, clients, and assets are protected against threats and risks, including unplanned and undesired events such as natural or manmade disasters, accidents, crime, civil unrest that has the potential to cause harm to an employee or groups of employees. This document arises from the requirements of the WSP Global Standard 105 for Crisis Management.

Impacts of unplanned and unexpected events may compromise the company's ability to continue operations in a safe and secure manner. Implementation of this Silver Plan is required where there is a need to protect our people, clients, brand, reputation, assets, and the general interests of our stakeholders and the wider community.

The objectives of this plan are to 1.) Identify potential/foreseeable threats and treat them before they are realized, 2.) Contain and manage the immediate of impact unplanned and unexpected events should they eventuate and 3.) Recover to a safe state key business operations and deliverables.

The **Silver** Team operates at a Regional Level and is responsible through business processes for identifying threats to overseas travellers or projects (horizon scanning), providing **strategic** direction in terms of effective crisis management.

During a crisis event the Silver team supports the Gold/Bronze team's response by driving and setting the strategic agenda (this includes the provision of functional support e.g. human resources, IT**,** H, S&S legal**,** and communications support when requested by the Gold/Bronze Teams). Decision support will be provided based on the scenario being managed.

Gold Team	→	Establishes Policy / Process / Links regions to Board (Crisis Management Standard / Policy)	
↕			
Silver Team Management Protocol	→	Regional Teams, including physical Crisis Management Process / Formats / Plan	Plans to follow 8 steps crisis
↕			
Bronze Team / Significant Organizational Change	→	Discipline / Country / Project Teams, including physical crisis management process / formats / plan	Review every 12 months

Implementation of this **Silver Plan** is required where there is a need to protect our people, clients, brand, reputation, assets, and the general interests of our stakeholders and the wider community.

The objectives of this plan are to:

1. Identify potential/foreseeable threats and treat them before they are realized,
2. Contain and manage the immediate impact of crisis, and
3. Return to normal operations.

Silver Team

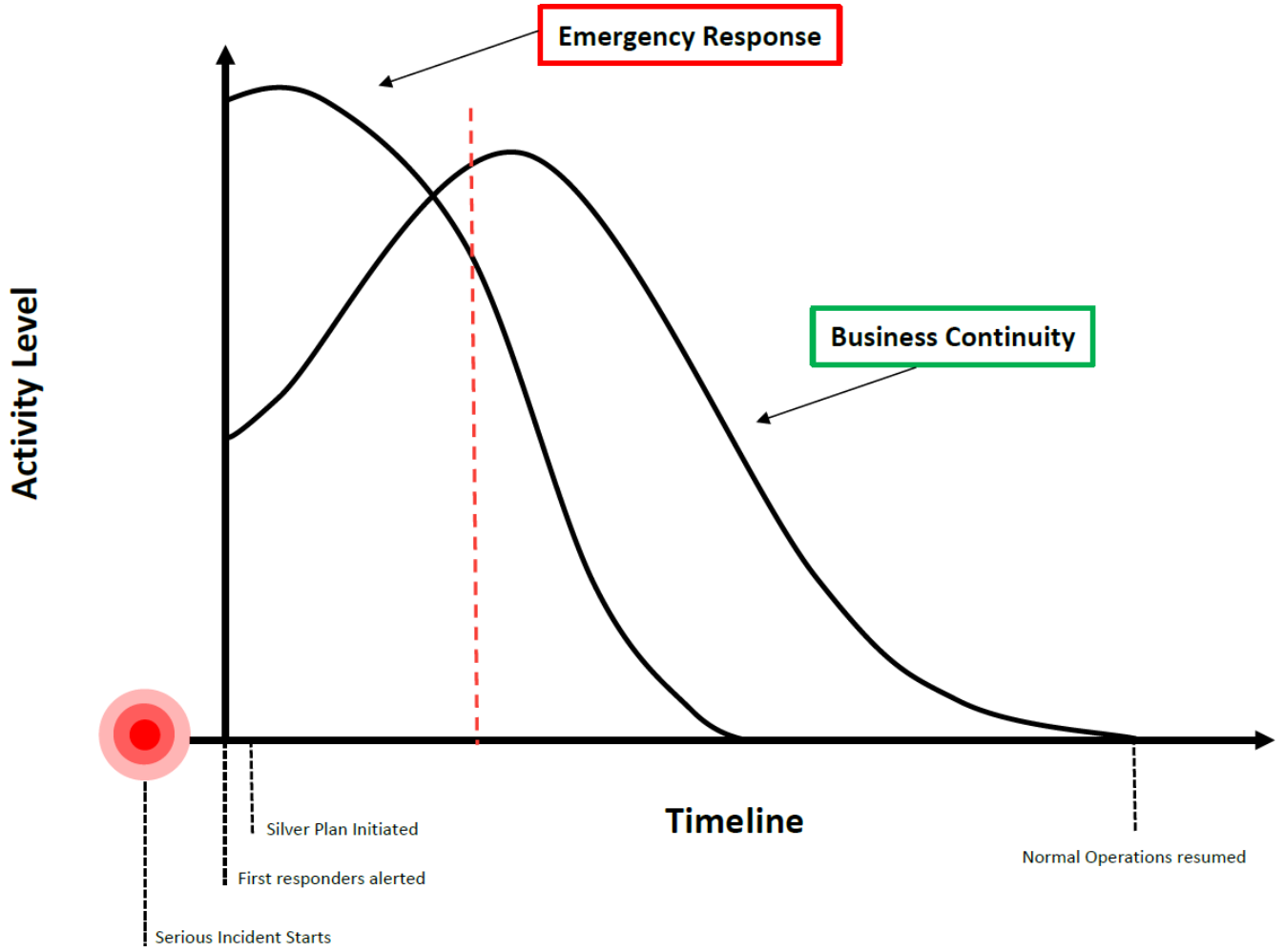
The Silver Team operates at a Canada Region Level and is responsible for identifying threats to its operations and providing strategic direction during a crisis.

The Silver Team will appoint an *emergency response leader* and a *business continuity leader* who will establish their respective teams based on the identified crisis at hand. They will also keep in contact with the Gold team as needed.

When responding to any crisis the Silver Team will follow the **RACER** approach:

- **Report**: Advise the Bronze/Gold Team/SHEQ Team ASAP
- **Assess**: Evaluate the impact and severity of the situation
- **Convene**: Assemble the most suitable response team for the situation
- **Execute**: Contain & manage situation using all available resources
- **Recover**: Post-event, conduct a formal review to drive continual improvement.

Crisis Actions Timeline



Roles and Responsibilities of Silver Team:

Title: Silver Team Membership

Scope	All operations	**Author**	Shawn Scott	**Last review**	2023-01-27
Country	Canada	**ISOS rating**		**Last test date**	

Key contacts	Role	Email	Mobile
International SOS	International support	Membership: 02AABC000037	+61 2 9372 2468
Michael Marley	Global Safety & Security	michael.marley@wsp.com	+44 781 606 3428
Anne- Sophie Tétreault	HSE	Anne-Sophie.Tetreault@wsp.com	+1 514 561-3003
Janet Oh	Legal & Regulatory	janet.oh@wsp.com	+1 514 340-0046
Gary Black	Security	gary.black@wsp.com	+ 1 647-539-8992
Maryse Tremblay	Ethics & Integrity	maryse.tremblay@wsp.com	+1 438-843-8076
John Lopes	Corporate Real Estate & Facilities Management	john.lopes@wsp.com	+1 289 218-9024
Renée Sauriol	Communications	renee.sauriol@wsp.com	+1 514 830-2892
Zoe Nutten	HR	zoe.nutten@wsp.com	+1 416 578-1292
Marc Albert	IT & IT Security	marc.albert@wsp.com	+1 514 349-5309
Peter Hatcher	Regional Leader Ontario, Atlantic, and West Canada	peter.hatcher@wsp.com	+1 403 589 0408
Sébastien Fecteau	Regional Leader Québec	sebastien.fecteau@wsp.com	+1 418 564-6363
Cari Anderson	Corporate Travel Booker/Admin	Cari.anderson@wsp.com	+1 647 643-1664
Charles-Olivier Bernard	Commercial & Risk Management	charles-olivier.bernard@wsp.com	+1 438 337-2875
Nadine Lalonde	Silver Team Call Lead – NON HSE Related	nadine.lalonde@wsp.com	+1 438 462-3379
Myriam Beauchemin	Silver Team Call Lead – HSE Related	myriam.beauchemin@wsp.com	+1 819 570-6032

Crisis Management – Silver Plan for WSP Canada

Nature of Threat: The following groupings list the potential threats that may occur within WSP Canada Operations. The identified threat and impact that should be considered by Silver/Bronze Teams when establishing local plans. These threats are categorized into HSE Led or Non-HSE led as identified in the chart above and this will help identify who is the emergency response coordinator responsible to initiate. Each call will identify the nature of the threat and the identified Emergency Response Leader and Business Continuity Leaders for each type, as identified below, will act as the Silver Team Call Co-Chairs and decision makers.

Category	Threat	Impact to Critical Business Activities	Emergency Response Leader	Business Continuity Leader	External Stakeholders
Workplace emergency	**Emergency impacting one or more workplaces - Natural disaster or utilities outage (non IT)**	Blocked worker access to/from workplace and/or safety risk travelling to/from project sites or home	Anne-Sophie Tétreault (HSE led)	Office Leaders Note: Office Leader to *interface with John Lopes (Facilities/Real Estate) as needed*	Local utilities companies Local news media Emergency Services Landlord Public Safety Canada
HSE	**Health or Safety Critical (Severe Injury or Fatality) Significant Environmental Incident**	Stop to project, WSP or client operations	Anne-Sophie Tétreault (HSE led)	Sector Leader *Note: if across Sectors Regional Leader to be added*	Provincial Ministry of Labour or equivalent Provincial Ministry of Environment
Security	**Terrorism/Active Shooter /Crime/Physical Security threat/Social Unrest**	Blocked worker access to/from workplace and/or immediate safety risk travelling to/from project sites or home	Anne-Sophie Tétreault (HSE led)	Regional Leader	Emergency Services Public Safety Canada Municipal and Provincial police
Travels	**International travels emergency**	Blocked worker access to workplace and/or immediate safety risk	Anne-Sophie Tétreault (HSE Led)	Sector Leader	Foreign Affairs and International Trade Canada (DFAIT) International SOS (iSOS)
Epidemic Pandemic	**Epidemic or Pandemic**	Blocked worker access to/from workplace and/or safety risk travelling to/from project sites or home, quarantines established by authorities, unplanned absences from work.	Anne-Sophie Tétreault (HSE led)	Regional Leader	Public Safety Canada Public Health Agency of Canada Provincial Ministries (Ministry of Labour, Ministry of Health, etc)
IT	**Phone/IT Security/IT network outage/Core System eg. ERP**	Inability to communicate or access critical information and continue operations	Marc Albert (Non-HSE led)	Regional Leader	Server provider ATOS Clients
Legal and Regulatory (includes EI)	**Authorities, Regulations, Liabilities, Insurance**	Major dispute, litigation	Janet Oh (Non-HSE led)	Regional Leader	
Financial	**Capital, Financial, Guarantees**	Pull on guaranties, major project claim, damages	George Niktaris	Regional Leader	
Reputation	**Reputational**	Adverse media attention, including due to involvement and/or failure in high profile project	Renee Sauriol (Non-HSE led)	Regional Leader	National news media Social media contacts – LinkedIn, Facebook, Twitter Clients

Crisis Management – Silver Plan for WSP Canada

Silver Crisis Team: In the event that a threat should develop, the first point of reference for an employee is to raise the issue to their Office Leader or Site Supervisor using the RACER methodology. The first point of contact for the Silver Team is the identified Emergency Response Leader and/or the identified Business Continuity leader associated with the nature of the threat in the chart above. The Emergency Response Leader will then inform the appropriate Silver Team Call Lead to initiate a call with the required team members as identified in the chart below.

Key Contacts										
Key contacts	**Role**	**Email**	**Mobile**	**IT**	**Workplace Emergency**	**Security**	**Reputational**	**Travels**	**HSE**	**Epidemic Pandemic**
Call Leader Type				**Non HSE Led**	**HSE Led**	**HSE Led**	**Non-HSE Led**	**HSE-Led**	**HSE Led**	**HSE Led**
Michael Marley	H&S (EMEIA)	michael.marley@wsp.com	+44 781 606 3428							
Anne-Sophie Tétreault	HSE	Anne-Sophie.Tetreault@wsp.com	+1 514 561-3003		X	X		X	X	X
Janet Oh	Legal & Regulation	janet.oh@wsp.com	+1 514 340-0046			X	X	X	X	X
Gary Black	Security Services	gary.black@wsp.com	+1 647-539-8992		X	X				X
Maryse Tremblay	Ethics & Integrity	maryse.tremblay@wsp.com	+1 438-843-8076				X			
John Lopes	Facilities/Supply Chain	john.lopes@wsp.com	+1 289 218-9024	X	X	X				X
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Detailed Roles and Responsibilities: For each potential threat identified, different SME and business leaders will be called upon to participate on a crisis call as identified in the chart above.

Specific roles and responsibilities of each of these roles are identified below:

Role	High Level Role Responsibilities	Accountabilities
HSE	Subject matter expert (SME) for all areas under HSE. They must retain an overview of the HSE impacts and activities to return to normal operations. They direct other team members within HSE to gather and analyse information, or complete specific tasks, and then make decisions based on the information available. They will coordinate with other SME groups as required	▸ Liaise with Global Health, Safety & Wellbeing Team and any external Security support required ▸ Ensure all HSE statutory commitments are identified, acted on and fully understood by the Team; ▸ Manage Health & Safety, Environment (HSE) responses consistent with the WSP Safety Management System; ▸ Maintain a strategic security overview of the incident, ensuring strategic security issues are appropriately managed; and, ▸ Assist the Team in addressing health, safety and environmental related issues.
Security Services	Subject matter expert (SME) for all areas under Security. They must maintain an overview of Security related impacts and activities during an incident leading to recovery operations. Members of Security Services will work with HSE, Facilities, Civil Police and other First Responders during the response and recovery phases of all incidents.	▸ Liaise with First Responders, Police/fire/Ambulance during a response to an incident; ▸ Ensure communications are maintained with CMT during an incident; ▸ Maintain a strategic security overview of the incident, ensuring strategic security issues are appropriately managed; ▸ Assist HSE, Facilities to maintain health and safety of all employees during an active incident.
Corporate Travel	Subject matter expert (SME) for all areas under Corporate Travel and the tracking of WSP employees travel movements. They gather and analyse information, or complete specific tasks, and then make decisions based on the information available. They will coordinate with other SME groups as required	▸ Work with Travel Management Company, ISOS, and Global Mobilty to identify and create a list of the employees that are either travelling to or have already arrived in the specified regions ▸ Advise Silver team of the list of employees and work with other SME groups, as required, on the development of a safe return strategy ▸ Work with HR and people managers to ensure the employee has been contacted and has confirmed that they are safe ▸ Implement the safe return strategy with employee, people manager, and HR ▸ Update Permissible Travel Matrix as required ▸ Work with Travel Management Company to ensure no further employees travel to the specified regions until issue resolved

IT & IT Security	Subject matter expert (SME) for all areas under IT and IT Security. They must retain an overview of the IT and IT Security impacts and activities to return to normal operations. They direct other team members within IT and IT Security to gather and analyse information, or complete specific tasks, and then make decisions based on the information available. They will coordinate with other SME groups as required	▸ Ensure that the Teams are provided with all IT capability and solutions to operate effectively in the event of a crisis; ▸ Maintenance of Crisis management related IT capability and solutions in readiness for a Crisis event; ▸ Provide support to the Team in terms of continuity of IT systems during the Crisis, and the provisional of additional capability, as required; ▸ Develop, own and maintain required Disaster Recovery Plans in readiness to meet defined success criteria; ▸ Implement and manage Disaster Recovery Plans to conclusion; and, ▸ Provide general IT systems advice and support to the Team on financial planning impacts and aspects
Corporate Real Estate & Facilities Management	Subject matter expert (SME) for all areas under Corporate Real Estate & Facilities Management, Work with internal and external parteners to restore critical business operations as quickly and safely as possible. Manage the Lease review, Landlord engagement and 3rd party	▸ Assess vulnerabilities: Fire, flood, power outages, inclement weather, terrorism, and natural disasters are examples of effects that can prevent the continued operation to the physical property. ▸ 3rd Party Management: Work with vendors/suppliers to bring the property and space back to business operational status. ▸ Communicate Updates: Advise the business of updates towards timeline to return to physical business as usual.
Legal & Regulation	Subject matter expert (SME) for all areas under Legal. They must retain an overview of the Legal impacts and activities to return to normal operations. They direct other team members within Legal to gather and analyze information, or complete specific tasks, and then make decisions based on the information available. They will coordinate with other SME groups as required.	▸ Assist in the development of a positive legal direction; advise on legal landscape and implications; ensuring the Team(s) recognize actions which could have adverse legal effects for WSP. ▸ Manage legal risk and insurance issues; and ▸ Ensure suitable investigative processes are undertaken. ▸ Ensure all legislative and ethical commitments required to be taken by WSP Canada and fully understood by the Team ▸ Review draft communications, and assess disclosure obligations
Ethics & Integrity	Subject matter expert (SME) for all areas under Ethics & Integrity. They must retain an overview of the ethical impacts of an event and activities that could put WSP's business integrity practices in question.	▸ Provide ethics and compliance related advice ▸ Provide guidance in relation to reputational impact tied to a business integrity risk ▸ Advise on how to manage files related to business integrity involving public bodies or public authorities

HR	Subject matter expert (SME) for all areas under People and Culture. They must retain an overview of the People and Culture impacts and activities to return to normal operations. They direct other team members within People and Culture to gather and analyse information, or complete specific tasks, and then make decisions based on the information available. They will coordinate with other SME groups as required	▸ Ensure all social, legislative and ethical commitments in regard to the treatment of staff and their families are acted on and fully understood by the Team; ▸ Ensure country-specific HR issues are adequately considered and dealt with; ▸ Ensure communication messages are appropriate to the current circumstances; ▸ Liaise with HR members from activated Teams; and ▸ Ensure accurate, consistent HR approach between response teams during the Crisis
Communications	Subject matter expert (SME) for all areas under Marketing and Communications. They must retain an overview of the Marketing and Communication impacts and activities to return to normal operations. They direct other team members within Marketing and Communications to gather and analyse information, or complete specific tasks, and then make decisions based on the information available. They will coordinate with other SME groups as required Communications during the first 48 hours of any Crisis are crucial.	▸ Identify and evaluate implications of the incident on WSP / Partners' reputation and future operability; ▸ Advise Team on development of internal and external communications strategy; ▸ Turns all information to the media spokesperson(s); ▸ Manages any Communications Support personnel deployed at the Team location; ▸ Manages any Pre-recorded message updates, if applicable
Regional Leaders	Regional Leaders act as the Business Continuity Leader for their appointed region on behalf of all the Sectors in their identified region. They must retain an overview of the business impacts and activities to return to normal operations. They direct other team members to gather and analyse information, or complete specific tasks, and then make decisions based on the information available.	▸ Providing guidance and support to operations (sectors) ▸ The decision maker with respect to operations (sectors), ▸ Ensure an integrated team response is coordinated, reporting and communicating is maintained; ▸ Lead the Team in managing the return to normal Operations
Sector Leaders	Sector Leaders act as the Business Continuity Leader for their appointed sector They must retain an overview of the business impacts and activities to return to normal operations. They direct other team members to gather and analyse information, or complete specific tasks, and then make decisions based on the information available.	▸ Providing guidance and support to operations (sectors) ▸ The decision maker with respect to operations (sectors), ▸ Ensure an integrated team response is coordinated, reporting and communicating is maintained; ▸ Lead the Team in managing the return to normal Operations

Commercial & Risk Management	Subject matter expert (SME) for all areas under Commerical and Risk Management They must retain an overview of the Commerical and Risk Management impacts and activities to return to normal operations. They direct other team members within Commerical and Risk Management to gather and analyse information, or complete specific tasks, and then make decisions based on the information available. They will coordinate with other SME groups as required	▸ Identify risks and related mitigations. ▸ Evaluate commercial positions and impacts. ▸ Assist in the development of a balanced commercial and risk direction on behalf of WSP's commercial commitments; ensuring the Team(s) recognise actions which could have adverse commercial impact for WSP. ▸ Manage risk and commercial impacts and/or issues; ▸ In collaboration with Finance, ensure all applicable financial notifications and tracking is carried out; ▸ Ensure adequate funds are available for incident response and recovery efforts; and ▸ Provide advice and support to the Team on financial planning impacts and aspects
Silver Team Call Lead HSE	*The call coordinator for HSE threats acts as both the Emergency Team Call Coordinator and Information Manager for the identified threat* **Emergency Team Coordinator:** The Emergency Team Coordinator is the person who gets things done, and takes full responsibility for the execution of the Leaders instructions. The Coordinator reports only to the Emergency Response Leader for the duration of the Crisis. **Information Manager:** The Information Manager controls and monitors the flow of information to/from all stakeholders during the call and post call follow	Emergency Call Lead Coordinator: ▸ Coordinate personnel and provide guidance to Silver members on their roles and tasks; ▸ Support the two-way flow of information, assist with support to other teams; and ▸ Maintain a strategic overview of the incident Information Manager: ▸ Coordinating the recurring meetings ▸ Receive, sort and make sense of incoming intelligence and information ▸ Maintain a chronological record of events and current status of response and recovery actions; ▸ Ensure relevant incoming information is noted and brought to the Team's attention; and, ▸ Maintain regular communication with the other Teams.

Silver Team Call Lead NON HSE	**The call coordinator for non-HSE threats acts as both the Emergency Team Call Coordinator and Information Manager for the identified threat** **Emergency Team Coordinator**: The Emergency Team Coordinator is the person who gets things done, and takes full responsibility for the execution of the Leaders instructions. The Coordinator reports only to the Emergency Response Leader for the duration of the Crisis. **Information Manager:** The Information Manager controls and monitors the flow of information to/from all stakeholders during the call and post call follow	Emergency Call Lead Coordinator: ▸ Coordinate personnel and provide guidance to Silver members on their roles and tasks; ▸ Support the two-way flow of information, assist with support to other teams; and ▸ Maintain a strategic overview of the incident Information Manager: ▸ Coordinating the recurring meetings ▸ Receive, sort and make sense of incoming intelligence and information ▸ Maintain a chronological record of events and current status of response and recovery actions; ▸ Ensure relevant incoming information is noted and brought to the Team's attention; and, ▸ Maintains regular communication with other other teams identified in the particular threat

Process:

Crisis management planning:

Canada will prepare a Crisis Management Plan ("**CMP**"/Silver/Bronze) Plan for each scoped area or situation (e.g. Region/Country/Major Project) that identifies the following based on the nature of operations/situation:

- Location details including key contacts to assist in a crisis
- Related response plans (e.g. playbooks)
- Critical activities
- Foreseeable threats including death, medical emergency, security threat, natural disaster, or civil disturbance
- Response time objectives for each threat event
- Threat mitigation planning.
- For work in high or critical risk countries (based on ISOS or on WSP's High-Risk Country list and policy) a thorough Health, Environment & Safety Plan must be completed and reviewed with the HSE team (and validated by Global HSE team) that includes details of robust security, medical and travel risk controls and a workable country evacuation plan.

Communicate, Train & Test:

- Communicate the CMP to affected people
- Provide crisis response training and refresher sessions for likely respondents
- At a minimum, each CMP must be scenario tested annually

Crisis response:

- **Report**: Advise the Gold/Silver/Bronze Team as appropriate.
- **Assess**: Evaluate the impact and severity of the situation and determine the crisis level per the Crisis and Incident Communications Policy.
- **Convene**: Assemble the most suitable response team for the situation.
- **Execute**: Contain & manage situation using all available resources.
  - Facts: what do we know?
  - Assumptions: what do we believe?
  - Scenarios: what are best-case, worst-case & likely scenarios?
  - Target objectives: what is our current objective? (e.g. more info, restore power)
  - Response options: what is the best response from the options available?
  - Implementation: what needs to be done now, by who? (e.g. action plan)
  - Stakeholders: prioritize key stakeholders according to interest & influence
  - Key messages: prepare & deliver key messages for priority stakeholders
- **Recover:** Post-event, conduct a formal review to drive continual improvement

Review effectiveness of arrangements

- Each Crisis Management Plan/Playbook shall be reviewed and updated periodically, at least annually or following major organizational change of acquisition activity.
- Opportunities to continually improve our approach to Crisis Management should be actively pursued

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REPORT

Spill Contingency Plan

2023 Environmental Site Assessment - West Channel and Camp Farewell

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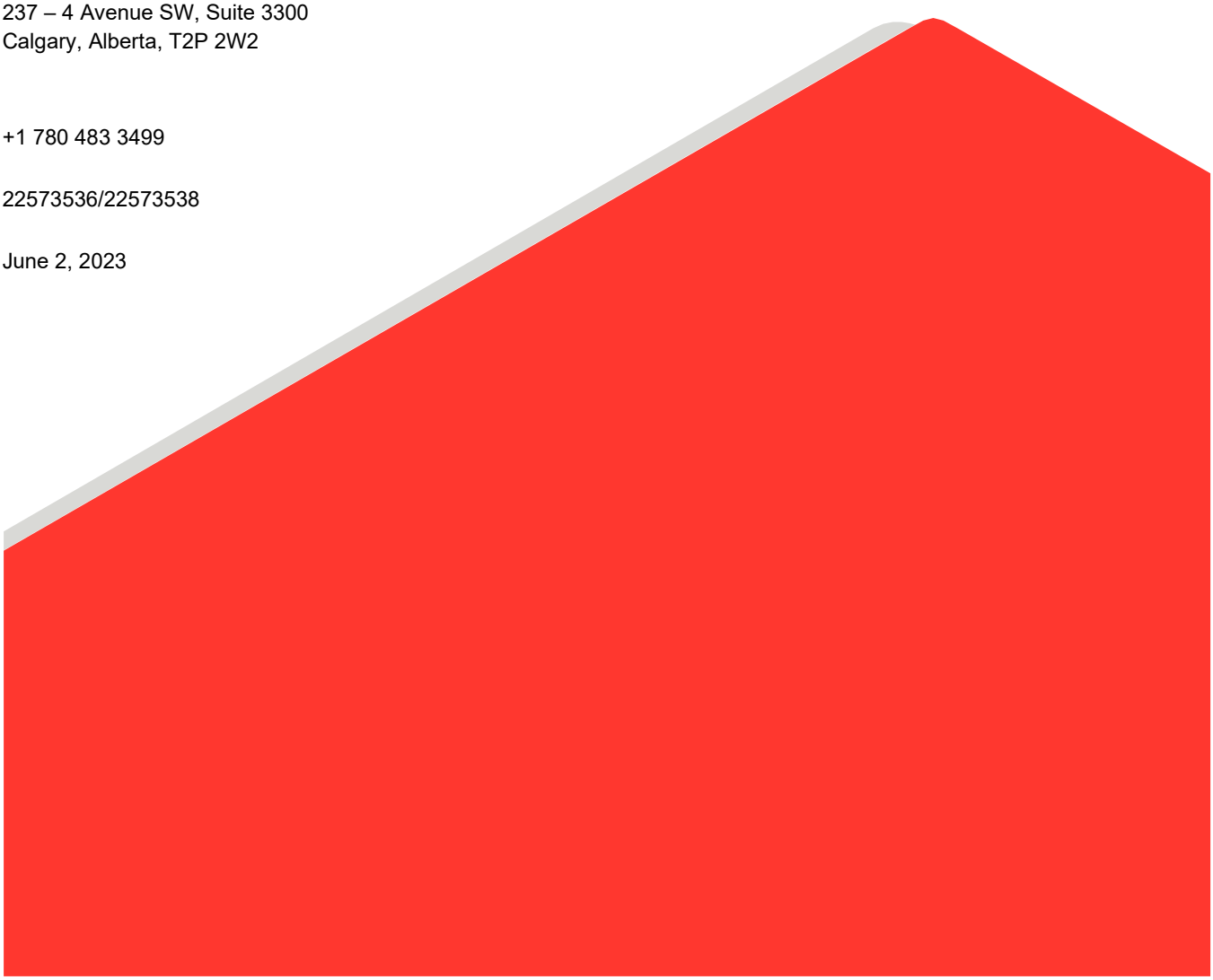
June 2, 2023



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1.0 INTRODUCTION AND PROJECT DETAILS

WSP Canada Inc. (WSP) was contracted by Shell Canada Limited (Shell) to develop a Spill contingency Plan for the Environmental Site Assessment (the Project) at former West Channel and Camp Farewell staging sites (the Sites). The purpose of this Plan is to describe the proper responses to several types of spills that may occur during the planned activities at the Sites.

The Plan will be effective upon its approval and will be implemented at the beginning of the 2023 phase of the Project (i.e., mid-June 2023). It includes the Spill Response Contact List for relevant organizations and agencies in the Northwest Territories (NWT/NT), and the reporting requirements in the event of a chemical, fuel, or waste spill. Paper copies of this Plan will be available on the Site (through the Site Superintendent) and will be posted at several prominent locations. All personnel will have access to paper and digital copies of the Plan. Prior to the commencement of work, the Plan will be distributed to personnel from Shell, WSP and selected subcontractors. It will be discussed with the entire crew at daily Health and Safety meetings.

Project details are provided in the following sections.

2.0 SITE LOCATIONS AND WORK DESCRIPTION

The location of West Channel and Camp Farewell sites as well as the proposed work description is described in sections below.

2.1 West Channel

The West Channel Staging Site (Lat/Long: 68°28'33.00"N / 135°33'25.00"W) is adjacent to the Peel Channel, approximately 37 kilometres northwest of Aklavik, on Inuvialuit 7(1)(a) private land in the Mackenzie Delta, NT.

The proposed scope of work at West Channel includes:

- Limited vegetation removal;
- Site survey;
- Drilling boreholes;
- Installing monitoring wells and temporary piezometers; and
- Sampling soil and groundwater.

Technical details can be found in the 2023 West Channel Technical Scope of Work (WSP 2023a). A barge camp will be set up for accommodation adjacent to the Site for the duration of the work.

2.2 Camp Farewell

The Camp Farewell site is located at 69°12’30.0’’N latitude and 135°06’04.4’’W longitude on the Mackenzie River within the Inuvialuit Settlement Region on the northeastern bank of the Middle Channel of the Mackenzie River Delta, NWT. The Site is approximately 125 kilometres northwest of Inuvik. The Site covers a land area of approximately 14 hectares (35 acres) within the Kendall Island Bird Sanctuary.

The proposed scope of work at Camp Farewell includes:

- Debris removal;

- Slope survey;
- Drilling boreholes; and
- Sampling soil and groundwater.

Technical details can be found in the 2023 Camp Farewell Technical Scope of Work 2023 (WSP 2023b). A barge camp will be set up for accommodation adjacent to the Site for the duration of the work.

In addition, staging of Jet A-1 Fuel for refuelling a helicopter will take place at Camp Farewell. The helicopter is being used to access Shell former wellsites in the region for the purpose of completing soil and water sampling.

3.0 POTENTIAL SPILLS AND THEIR ENVIRONMENTAL IMPACTS

3.1 Antifreeze-Coolant, Diesel Fuel, Lube Oils, Grease, and Aviation Fuel

Diesel, coolant, lube oils, grease, and aviation fuel may be harmful to human health, wildlife, and aquatic life. Diesel burns slowly which reduces the risk to the environment during recovery because a burn can be easier to contain.

There will be one 50,000 L tank of diesel aboard the barge (within the hull) and fuel trucks or fuel tank at the Site. In a worst-case scenario, the hull of the barge is punctured and contents seep through and overflow secondary containment into the surrounding water bodies.

The diesel fuel truck will be staged at least 100 m from any water body. The fuel truck will contain approximately 2,000 L of diesel that could leak into the surrounding land.

There will be two double walled, single compartment, fuel trucks containing 18,200 L each of aviation fuel (Jet A-1) for refuelling a helicopter at Camp Farewell twice a day from mid-June to September 30, 2023. The Jet-A1 fuel trucks will be stored at least 100 m away from any water body. Alternatively, one 61,000 L double-walled Jet A-1 Enviro-Tank containing up to 36,400 L of Jet A-1 fuel with a pump and generator (i.e. light tower), will be used instead of the fuel trucks. A total of 36,400 L of Jet A-1 will be stored in the fuel trucks or Enviro-Tank on-site that could leak into the surrounding land. Jet A-1 may be harmful to human health, wildlife, and aquatic life.

Antifreeze or engine coolant products are used in automotive engines and generally consist of ethylene glycol or propylene glycol mixed with distilled water. Coolant will be used in the engines of the vehicles onsite in limited quantities that could leak onto the surrounding land.

3.2 Propane

Propane may be harmful to human health, to wildlife and to the surrounding environment. Propane is extremely volatile and flammable and can possibly impact human health and the surrounding environment if leaks that may result in fires or explosions are not prevented, recognized, or stopped. There will be up to four 2,273 L tanks at the Site at any given time. In a worst-case scenario, all cylinders are punctured or fail, and contents leak into the surrounding environment and ignite, possibly leading to an explosion. This would involve up to 9,092 L of propane. Emergency response drills and daily safety meetings will address this scenario.

3.3 Sewage

Direct exposure to sewage may be harmful to wildlife and humans as it may cause illness.

There are three 4,000 L combined grey and black (sewage) tanks on the barge servicing the camp. There is also a spacer barge with one 45,000 L tank for storage capacity, if required.

In a worst-case scenario 57,000 L of sewage from the barge camp would enter the river.

3.4 Classification of Dangerous Goods

The waste generator (consignor) is responsible for classifying all dangerous goods that are shipped. Goods classified by the manufacturer will be verified by the contractor on-site. Where the composition of the products has been changed, (e.g., mixtures of hazardous waste) the products may need to be reclassified. The carrier is responsible for ensuring that the documentation matches the package. All vehicles transporting dangerous goods into, or out of the Site will have proper placarding on vehicles. Containers will also be labelled according to the requirements laid out by the *Transportation of Dangerous Goods (TDG) Act* and Regulations. The Site contractor is responsible for completing the shipping document. Personnel transporting dangerous goods must complete transportation of dangerous goods training as outlined in the Health, Safety, Security and Environment Management Plan.

Persons ordering and receiving dangerous goods shall ensure that shipping documents are sent by the suppliers where required by the TDG Act and Regulations and shall refuse shipments if not in compliance. Documents must be retained for at least two years.

4.0 SPILL RESPONSE ORGANIZATION

4.1 Regulatory Agencies

- Poses an imminent threat to a listed species at risk or its critical habitat.

If applicable, a detailed report including GPS location(s) will be submitted to the applicable regulatory agency no later than 30 days after the initial report of any spill occurrence.

Table A below indicates the current spill response contact list and Figure A below depicts a flow chart for spill response. The WSP Site Supervisor (and Alternate) will be responsible for activating the Plan.

Table A: Spill Response Contact List

Organization	Contact	Phone Number
NWT 24-Hour Spill Report Line	n/a	867-920-8130
IWB	Mardy Semmler	867-678-2942
GNWT Environment Protection Officer, Inuvik	Alicia McRae	867-678-6653 867-620-0770 (mobile)
GNWT Environment and Natural Resources, Inuvik (Water Resources Officer)	Lloyd Gruben	867-678-8091 ext. 53659 867-678-0623 (mobile)
Canadian Coast Guard 24-Hour Spill Reporting Line for Arctic Waters	n/a	1-800-265-0237
WSP Site Superintendent	Lisa Switzer	226-376-2812
WSP Project Manager	Punchalee Clair	902-221-6875
WSP Project Director	Patrick Kalita	780-239-1420
WSP Health and Safety Advisor	Lisa Switzer	226-376-2812
Shell Project Manager	Kyle Thompson	403-691-3174 ext. 3174
Shell Media and Public Enquiries	n/a	1-800-661-1600

Notes:
n/a – not applicable
TBD – to be determined

A variety of communications equipment will be available at the Site for use during the Project. Table B below summarizes the communications equipment for the Project.

Table B: Communications Equipment for the Project

Project Component	Company	Equipment (Number)
Summer Field Work	WSP	Satellite phone (2) / cell phone (2) / inReach device (2) / handheld radios (2)
	Civil Subcontractors	Satellite phone (2) / Satellite-based Land line (1) Cab-mounted radios (2) / cell phones (3) / handheld radios (3)
	Drilling Subcontractors	Satellite phone (1) / handheld radios (1)
	Total	Satellite phone (6) / cab-mounted radios (2) / cell phones (7) / inReach device (2) / handheld radios (6) / Satellite-based internet available onsite

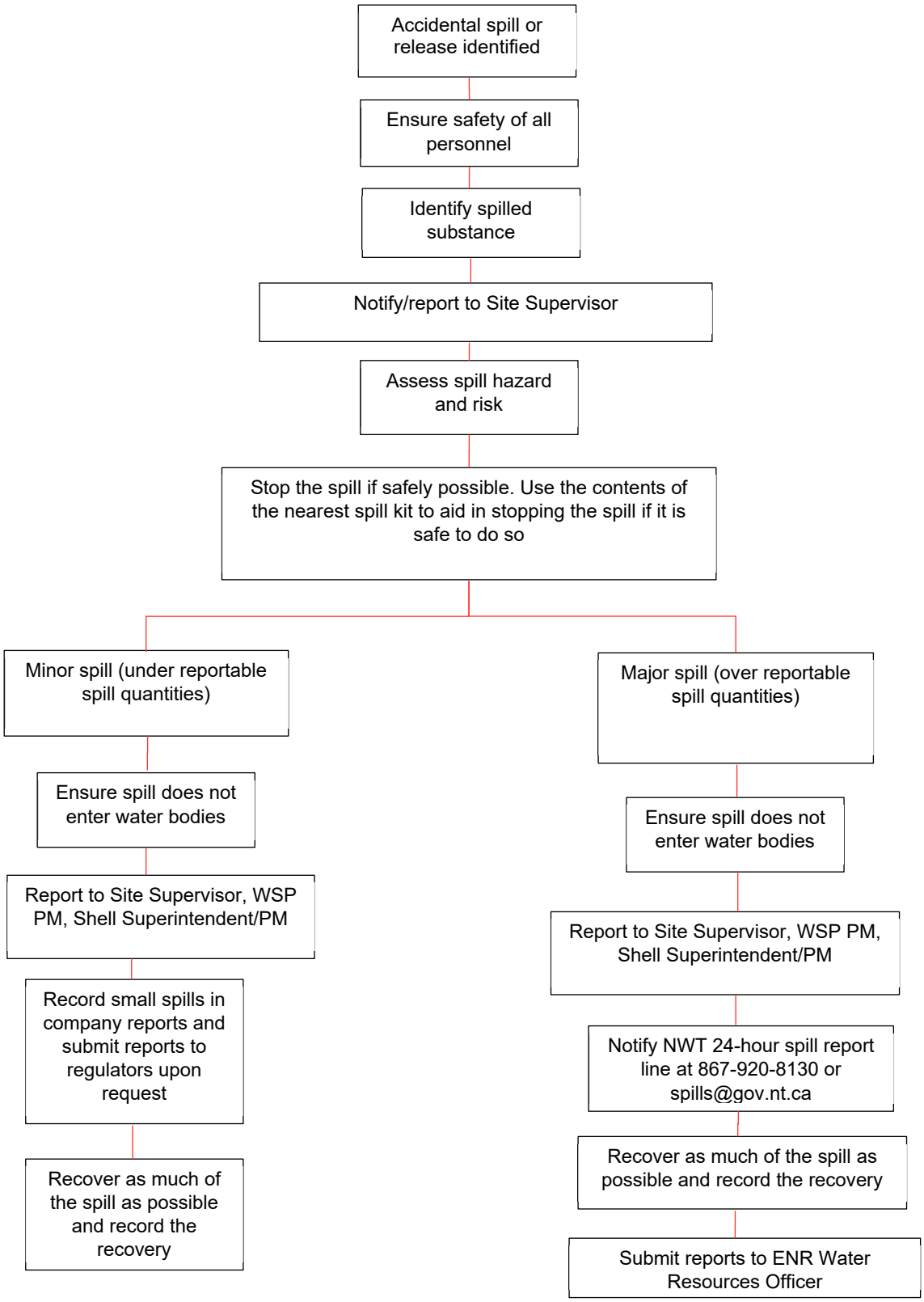


Figure A: Spill Response Flow Chart

5.0 PREVENTATIVE MEASURES

The following section provides details on the existing preventative measures that are in place for the Project regarding fuel storage, secondary containment, fuel handling procedures, and related activities that have the potential to result in a spill event.

Spill kits will be located wherever fuel is stored or used. Refer further to Section 7.1.1 for details on spill kit contents. Portable drip trays and appropriately sized fuel transfer hoses will be used when refueling motorized equipment, to avoid any leaks/drips onto the land. No heavy equipment will be refueled within 30 m of a water body. Equipment on-site will be refueled in-land using a fuel truck. Established procedures and drip trays will be used during refueling operations to prevent any spills.

The WSP Site Supervisor and designated fuel monitor will conduct daily visual inspections to check for leaks or damage to any fuel storage facilities. Regular maintenance and oil checks of all motorized equipment will also be undertaken to avoid preventable leaks.

6.0 SPILL RESPONSE ACTIONS

6.1 Initial Spill Response Actions

- Ensure safety of all personnel.
- If needed, evacuate or divert workers from the spill area.
- Remove all sources of ignition.
- Stop the spill if safely possible (e.g., shut off pump, replace cap, tip drum upward, patch leaking hole). Use the contents of the nearest spill kit to aid in stopping the spill if it is safe to do so.
- Minimize vehicular traffic as much as possible at the spill site.
- Mark, flag and flag-off any area that is deemed hazardous to humans or wildlife.
- Monitor the air at the perimeter of the flagged off area, as necessary.
- Use personal protective equipment (PPE) until concentrations are determined to be within acceptable levels.
- Assess spill hazards and risks.
- Identify the leak location along with the type of product/material spilled, the duration and the volume released.
- Evaluate ground and weather conditions to assess the risk to environment (i.e., rain, gravel, sand, water body, muskeg, etc.).
- Contain the spill by using contents of spill kits. Place sorbent materials on the spill or dig a berm/bell hole to contain the spill.
- Relay information to internal company contacts, government agencies and, if required, the designated communications representative.

6.2 Spill Assessment (Land)

Land spills will spread outward from the initial spill point toward lower-lying areas. Soil infiltration will also occur at varying rates, dependent on the soil type and the nature of the product spilled.

Following the initial hazard assessment and development of a site safety plan, detailed information on the location and effects of the spill on the land will be collected. The spill boundary will be identified with the appropriate equipment, including:

- PPE;
- Gas detection monitors;
- Measuring tape;
- GPS;
- Shovel;
- Excavator, drill or sampling equipment if subsurface contamination is suspected; and
- Camera.

Use a handheld air monitor to assess the potential of flammable vapours in the area. Produce a sketch of the spill and take photographs. Next, identify land uses in areas affected by the spill. Look at whether the spill affects private landowners, public land (green areas, parks), dispositions (pipelines, utilities, roads, facilities, trappers, etc.), or sensitive areas (protected areas, wildlife habitat, archaeological resources etc.).

Based on the land use in the spilled area, evaluate Site for wildlife, and determine the approval requirements for accessing the spill site. Reporting details are provided in Section 9.0. It is important to note the terrain, soil types, characteristics and conditions, as well as the vegetation types on the Site. Surface runoff patterns, erosion potential, moisture levels and movement of the water table can all impact the severity of the spill and the way in which it can be contained so it is imperative to take note of all of these observations before proceeding with cleanup. When the previous considerations have been addressed, the next course of action is to determine the equipment resources that are required to control the spill. The initial assessment will impact what equipment will be used, how it will be transported to the spill site and how it will improve or create access to the spill.

6.3 Spill Assessment (Water)

Begin by assessing the characteristics of the affected water course including width, depth and velocity. Shoreline characteristics and sensitivities also need to be taken into consideration. The degree of impact, degree of sensitivity (ecological, cultural, human use, etc.) and the physical limitations can all affect the way in which a spill will be contained. Note that there are no water bodies at the Site. Therefore, this section focuses on a spill potentially reaching the Mackenzie River.

In the absence of any current or wind, a spill on water bodies will spread out in all directions from the site of the spill until a uniform stable thickness is reached. If wind and/or current are present, the spill will move with the wind or current until it reaches the shoreline.

Wave action in the water body may also affect the spill causing oil-in-water or water-in-oil emulsions to form, making recovery and cleanup efforts more difficult.

The Site Supervisor and/or subcontractors will attempt to contain the spill to as small an area as possible and the water body near the spill source. Dispersion of the spill over a large area on the water body could cause widespread impacts when the spill reaches the shore. If the spill can be contained on the water body, the spilled material is moved toward shore for recovery.

Containment options for spills on water bodies may include the use a containment boom to surround the spill. If the area that may be impinged by the spilled materials is environmentally sensitive, appropriate shoreline protection measures may be implemented.

6.4 First Aid

A medic will be on-site at all times. First aid measures will vary based on the type of materials involved in the spill. It is recommended that personnel follow all chemical-specific instructions or call the NWT 24-Hour Spill Reporting Line for assistance. Refer to the chemical-specific safety data sheets (SDS) if skin contact, eye contact, inhalation, or ingestion should occur and follow the first aid procedure on the SDS. Information on poison control for hazardous chemicals ingested can be obtained by calling the Inuvik Regional Hospital at (867) 777-8000 or Tuktoyaktuk Regional Health Services at (867) 977-2321.

7.0 RESPONSE ACTIONS BY SPILL TYPE

7.1 Chemical Spills

The action plan laid out here is generally applicable to any chemical spill that the Project may encounter, but some chemicals may have special handling and disposal requirements. Refer to Workplace Hazardous Materials Information System (WHMIS) labels and SDSs for chemical-specific information.

7.1.1 Initial Action

In the event of a chemical spill, the following measures will be taken immediately:

- Determine the type of chemical.
- Evacuate unnecessary personnel.
- Ventilate area of leak or spill (opening all doors and windows).
- Wear PPE (gloves, safety glasses, impervious material long-sleeved shirt/coat).
- If available, wear respirator/self-contained breathing apparatus.
- Remove all other chemicals from the area if safe to do so.
- For small spills, dilute with water, mop or wipe up and place in proper container.
- For large spills, contain by diking (soil/dry sand/kitty litter), absorb with inert material (soil/dry sand/kitty litter) and place in chemical waste container.
- After mopping up chemical, wash area well with soap and water, mopping into spill container and not to the ground.
- Do not use combustible materials (i.e., sawdust or cardboard).
- Contain runoff from spill clean-up.
- Notify the NWT 24-Hour Spill Report Line at (867) 920-8130 to receive disposal information.

7.1.2 Follow-Up Action

After the spill has been cleaned up, other reporting, disposal, and follow-up activities may be required. The following measures will be taken if applicable:

- Contain chemical, inert absorbent material, and mop up water as directed by Spill Report Line personnel and applicable regulators, and dispose of material off-site in Inuvik.
- Arrange for repair or replacement of chemical containers, and equipment, if damaged or leaking.
- Submit a detailed report on the occurrence to the applicable regulatory agency within 30 days of reporting the spill event.

7.2 Antifreeze-Coolant, Diesel, Lube Oils, Propane, Grease and Aviation Fuel Spills

Petroleum product spills may range from minor spills during operations such as refueling, to constant leakage from tanks or equipment fuel lines in need of repair, to major spills causing contaminated soil/water issues.

Depending on the location of the spill, a petroleum product spill may result in contaminated soil or water. The contaminated material must be cleaned up and removed for disposal along with the spilled petroleum product.

Petroleum and antifreeze product spills can be handled in the same manner. Refer to WHMIS labels and SDS for chemical-specific information.

7.2.1 Initial Action

In the event of a petroleum or antifreeze product spill, the following measures will be taken immediately:

- Shut off ignition sources, if safe to do so.
- Identify the spilled material and locate the source.
- Stop the spill at the source, if safe to do so.
- Take actions to contain/clean up spilled material.
- Record relevant information for reporting including the quantity of material spilled, product type, location, date, weather, and other relevant information.
- Notify the NWT 24-Hour Spill Report Line at (867) 920-8130.

7.2.2 Follow-Up Action

After the initial clean-up and reporting procedures, other activities may be required such as reporting and disposal. The following measures will be taken if applicable:

- Collect soil samples for laboratory analysis to determine that spill has been cleaned up.
- Dispose of soil off-site in Inuvik.
- Arrange for repair or replacement of petroleum product containers, and equipment, if damaged or leaking.
- Submit a detailed report on the occurrence to the relevant regulatory agency within 30 days of reporting the event.

- For large spills, install wells to monitor groundwater for signs of contamination. Determine the level of final clean-up in consultation with an Aboriginal Affairs and Northern Development Canada inspector.

7.3 Sewage

The transfer of sewage from the barge to the Inuvik sewage lagoon at the end of the season will be undertaken in a manner that will prevent spills. In the event of a spill, the area of impact will be minimized and then cleaned up.

7.3.1 Preventative Action

- Personnel undertaking sewage transfers in Inuvik will be properly trained and aware of the potential concerns with this activity.
- All hoses and connections will be checked for condition and presence of potential leaks.
- The pump operator will remain at the pump for the duration of the transfer.
- The pump operator will have direct visual contact with the line and the receiving tank or will have constant radio contract with a spotter.
- A spotter will walk the line during the transfer looking for any leaks or signs of potential failure (bulges, etc.).
- If the spotter identifies any concerns, the pump will be shut down and the issue addressed.
- Drip trays or secondary containment will be used to prevent drips from entering the environment.
- Once the transfer is completed, the hoses will be emptied as much as possible. Then they will be carefully removed and handled to keep any remaining contents in the hose.
- All connections, lids and caps will be made secure.

7.3.2 Initial Action

In the event of a sewage spill, the following measures will be taken immediately:

- Shut off ignition sources if methane gas is present (when safe to do so).
- Identify the spilled material and locate the source.
- Stop the spill at the source, if safe to do so.
- Take actions to contain/clean up spilled material.
- Record relevant information for reporting including the quantity of material spilled, product type, location, date, weather, and other relevant information.
- If spill volume is above the recordable quantity (as per Appendix A), notify the NWT 24-Hour Spill Report Line at (867) 920-8130.

7.3.3 Follow-Up Action

After the initial clean-up and reporting procedures, other activities may be required such as reporting and disposal. The following measures will be taken if applicable:

- Load material onto barge, if spill did not occur in Inuvik, and dispose of sewage off-site in Inuvik in an appropriate manner.
- Submit a detailed report (if required) on the occurrence to the applicable regulatory agency within 30 days of reporting the event.

8.0 RESOURCE INVENTORY

The following section provides details on the resources that will be available on the Site to aid in spill response. The procedures for handling, transporting, and disposing, in Inuvik, of spill-related wastes are outlined in the Waste Management Plan. The Waste Management Plan will be implemented during all Project activities and its contents will be included in daily Health and Safety meetings with all staff and contractors. In addition, SDS for the material detailed in Section 2 will be available (see Section 10.0).

8.1 On-Site Resources

A minimum of five spill kits will be located throughout the Site with contents described below. In addition, earth moving, and other equipment is located at the Site at all times to assist with spill response (as listed below). Spill response equipment will be located inside all heavy equipment and vehicles used at the Site. Additional spill response equipment will be located at the fuel transfer location. Spill kits will be replenished throughout the program as required.

8.1.1 Spill Kit Contents

- Four Tyvek splash suits;
- Four pairs of chemical master gloves;
- 10 large bags with ties for temporary use;
- Two oil only booms (5” x 10');
- Two oil only floating booms (5” x 10');
- 50 oil only mats (16” x 20”);
- Five sorbent socks;
- 10 sorbent pads;
- Two large tarps;
- Roll(s) of duct tape;
- One utility knife;
- One field notebook and pencil;
- One rake;
- One pick axe;
- Three aluminum scoop shovels; and
- One instruction binder.

8.1.2 Equipment Specific to Chemical Spills

One of the spill kits available at the Site will have additional supplies to aid in the event of a chemical or fuel spill. The kit will include:

- Heavy-duty gloves;
- Safety glasses;
- Mop/wringer/spill squeegee;
- Shovel/broom/dustpan;
- Chemical spill container with sealable lid; and
- Sand/kitty litter (absorbent, non-flammable material).

Additionally, a 50-gallon Universal Sorbent Spill Kit will be provided, which includes:

- 10 socks (3" by 48");
- Four socks (3" by 10');
- 50 pads (15" by 17");
- Four pillows;
- 50 wipers;
- Five disposal bags and ties;
- Five tamperproof seals;
- Two pairs of nitrile gloves; and
- One emergency response guidebook.

8.1.3 Equipment Specific to Antifreeze-Coolant, Diesel Fuel, Lube Oils, Propane, Grease and Aviation Fuel Spills

One spill kit will be on-hand at the fuel storage area. The kit will include:

- Chemical-resistant gloves;
- Safety glasses;
- Mop/wringer/spill squeegee;
- Shovel/broom/dustpan;
- Chemical spill container with sealable lid; and
- Sand/kitty litter (absorbent, non-flammable material).

Additionally, a 50-gallon Universal Sorbent Spill Kit will be provided with contents described in Section 8.1.2.

8.1.4 Equipment Specific to Sewage Transfer Spills

Two spill kits will be on-hand in the vicinity of the sewage transfer with one kit near each end of the transfer. The kits will include:

- Heavy-duty gloves;
- Safety glasses;
- Mop/wringer/spill squeegee;
- Shovel/broom/dustpan; and
- Sand/kitty litter (absorbent, non-flammable material).

Additionally, a 50-gallon Universal Sorbent Spill Kit will be provided with contents described in Section 8.1.2.

8.1.5 Earth Moving and Other Equipment

It is anticipated that the following equipment will be available on the Site:

- One loader;
- One excavator;
- One Mobile Augers M5T Drill Rig;
- One emergency boat;
- Fuel transfer hoses with pumps; and
- One service truck with toolbox.

8.2 Off-Site Resources

Spill response contact numbers are provided in Table A above.

9.0 SPILL RESPONSE TRAINING

The Project is committed to ensuring that all personnel involved in spill response activities fully understand their roles and the roles of others with whom they may interact during an incident. To meet this commitment and to ensure personnel respond effectively, training activities will include:

9.1 Orientation

- Provide all Site personnel with an orientation of the Project's Spill Contingency Plan and its applicable elements.
- Discuss and clarify bridging between WSP's emergency response procedures and this Project Spill Contingency Plan, where applicable.
- Utilize summary wall charts outlining key responsibilities and lines of communication for quick reference purposes.
- Devote a portion of scheduled safety and/or staff meetings to discussion of spill response issues on an ongoing basis.

9.2 Spill Response Drills

WSP will conduct a minimum of one monthly spill response drill to ensure the readiness of the project team.

9.3 External Orientation

As appropriate, brief and familiarize all external groups or agencies having a role in this Plan and define their specific responsibilities under the Plan.

9.4 Training Records

The WSP Site Supervisor will be tracking all training requirements and compliance utilizing a spreadsheet. Training records will be reviewed by WSP prior to mobilization.

10.0 REPORTING REQUIREMENTS

As outlined in Section 3.2, all spills, regardless of quantity, will be reported to the Site Supervisor and the Shell PM. Spills to be reported include spills that have already occurred, or potential spills that are about to occur. Spills must be reported if the amount is greater than or equal to the amount listed in the spill response thresholds (Appendix A). The spill response thresholds for a wide variety of materials, compounds, and liquids are provided by the Spill Contingency Planning and Reporting Regulations under the *Environmental Protection Act* (1988) and are provided in Appendix A.

In accordance with the Spill Contingency Planning and Reporting Regulations, any reportable spill will be reported immediately to the NWT 24-Hour Spill Report Line at (867) 920-8130. The following details will be provided (if possible):

- Date and time of spill;
- Location of spill;
- Direction spill is moving;
- Name and phone number of a contact person close to the location of spill;
- Type and quantity of contaminant spilled and cause of spill;
- Whether spill is continuing or has been stopped;
- Description of existing containment;
- Actions taken to contain, recover, clean-up and dispose of the contaminant; and
- Name and phone number of the person reporting the spill and the person in charge or control of contaminants at time of spill.

A detailed report on the occurrence may also be submitted using the NT-NU Spill Report Form and emailed to spills@gov.nt.ca (Appendix B).

In the very unlikely event that the public may be affected by a spill, the WSP PM will inform Shell of the nature and size of the spill.

11.0 SAFETY DATA SHEETS

SDS have been provided in Appendix C for the materials outlined in Section 2. It should be noted that the documents in Appendix C still use the previous name Material Safety Data Sheets, but are referred to by their current official name, SDS. These SDS are presented for informational purposes only and should not be used for WHMIS purposes. SDS from the actual vendors will be acquired and maintained for WHMIS compliance and, if applicable, will replace the sheets in this Plan.

The list of contaminants presented above is not intended to be a comprehensive list of potential contaminants the Project might face but is merely to present the common contaminants that may be encountered on a regular basis.

12.0 REFERENCES

WSP, 2023a. 2023 Technical Scope of Work former West Channel Staging Site. May 29, 2023

WSP. 2023b. 2023 Technical Scope of Work Camp Farewell, Inuvialuit Settlement Region, Northwest Territories. May 18, 2023.

13.0 STATEMENT OF LIMITATIONS

This report was prepared for the exclusive use of Shell Canada Limited. The report, which specifically includes all tables and figures, is based on data and information provided by Shell as described in this report. However, it is never possible, even with exhaustive sampling and testing, to dismiss the possibility that part of a site may be contaminated and remain undetected.

The services performed as described in this report were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services. Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. WSP Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The content of this report is based on information collected during our investigation, our present understanding of the Site conditions, and our professional judgment in light of such information at the time of this report. This report provides a professional opinion and therefore no warranty is expressed, implied, or made as to the conclusions, advice and recommendations offered in this report. This report does not provide a legal opinion regarding compliance with applicable laws.

With respect to regulatory compliance issues, it should be noted that regulatory statutes and the interpretation of regulatory statues are subject to change. The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, WSP Canada Inc. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

Signature Page

WSP Canada Inc.

Punchalee Clair, P.Eng.
Project Manager

Patrick Kalita, B.Sc.
Project Director

PC/PK/kdc

APPENDIX A

Spill Response Threshold

Spill Response Threshold

Immediately Reportable Spill Quantities

Substance for NWT 24 hour Spill Line	Immediately Reportable Quantities
Explosives Compressed gas (toxic/corrosive) Infectious substance Sewage and Wastewater (unless otherwise authorized) Radioactive materials Unknown substance	Any amount
Compressed gas (Flammable) Compressed gas (non-corrosive, non-flammable)	Any amount of gas from containers with a capacity grater than 100 L
Flammable liquid	≥100 L
Flammable solid Substances liable to spontaneous combustion Water reactant substances	≥ 25 kilogram (kg)
Oxidizing substances	≥ 50 L or 50 kg
Organic peroxides Environmentally hazardous substances intended for disposal	≥1 L or 1 kg
Toxic substances	≥ 5 L or 5 kg
Corrosive substances Miscellaneous products, substances or organisms	≥ 5 L or 5 kg
Polychlorinated biphenyl (PCB) mixtures of 5 or more parts per million (ppm)	≥ 0.5 L or 0.5 kg
Other contaminants--for example, crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, wastewater.	≥ 100 L or 100 kg
Sour natural gas (i.e., contains H_2S) Sweet natural gas	Uncontrolled release or sustained flow of 10 minutes or more
Flammable liquid Vehicle fluid	≥ 20 L When released on a frozen water body that is being used as a working surface

In addition, all releases of harmful substances, regardless of quantity, are to be reported to the NWT spill line if the release is near or into a water body, is near or into a designated sensitive environment or habitat, poses an imminent threat to human health or safety, or poses an imminent threat to a listed species at risk or its critical habitat.

APPENDIX B

NT/NU Spill Response Form

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
Tel: (867) 920-8130 • Fax: (867) 873-6924 • Email: spills@gov.nt.ca

REPORT LINE USE ONLY

A	Report Date: MM DD YY	Report Time:	☐ Original Spill Report **OR** ☐ Update # _____ to the Original Spill Report	**Report Number:**
B	Occurrence Date: MM DD YY	Occurrence Time:		
C	Land Use Permit Number (if applicable):		Water Licence Number (if applicable):	
D	Geographic Place Name or Distance and Direction from the Named Location:		Region: ☐ NT ☐ Nunavut ☐ Adjacent Jurisdiction or Ocean	
E	Latitude: _____ Degrees _____ Minutes _____ Seconds		Longitude: _____ Degrees _____ Minutes _____ Seconds	
F	Responsible Party or Vessel Name:		Responsible Party Address or Office Location:	
G	Any Contractor Involved:		Contractor Address or Office Location:	
H	Product Spilled: ☐ Potential Spill	Quantity in Litres, Kilograms or Cubic Metres:	U.N. Number:	
I	Spill Source:	Spill Cause:	Area of Contamination in Square Metres:	
J	Factors Affecting Spill or Recovery:	Describe Any Assistance Required:	Hazards to Persons, Property or Environment:	
K	Additional Information, Comments, Actions Proposed or Taken to Contain, Recover or Dispose of Spilled Product and Contaminated Materials:			

L	Reported to Spill Line by:	Position:	Employer:	Location Calling From:	Telephone:
M	Any Alternate Contact:	Position:	Employer:	Alternate Contact Location:	Alternate Telephone:

REPORT LINE USE ONLY

N	Received at Spill Line by:	Position:	Employer:	Location Called:	Report Line Number:

Lead Agency: ☐ EC ☐ CCG/TCMSS ☐ GNWT ☐ GN ☐ ILA ☐ AANDC ☐ NEB ☐ Other: _____

Significance: ☐ Minor ☐ Major ☐ Unknown

File Status: ☐ Open ☐ Closed

Agency:	**Contact Name:**	**Contact Time:**	**Remarks:**
Lead Agency:			
First Support Agency:			
Second Support Agency:			
Third Support Agency:			

APPENDIX C

Safety Data Sheets

SAFETY DATA SHEET
According to the Hazardous Products Regulations
Ethylene Glycol Antifreeze Grade

Version	Revision Date:	SDS Number:	Print Date: 2022-08-29
5.4	2022-07-13	800001009853	Date of last issue: 22.09.2021
			Date of first issue: 21.10.2003

SECTION 1. IDENTIFICATION

Product name : Ethylene Glycol Antifreeze Grade

Product code : U1281, U1293, U1296

Manufacturer or supplier's details

Manufacturer/Supplier : **Shell Chemicals Canada**
PO Box 4280 STN C
CALGARY AB T2T 5Z5
Canada

Telephone : 1-855-697-4355

Telefax : 1-866-213-7508

Emergency telephone number

CHEMTREC (24 hr) : 1-800-424-9300

Recommended use of the chemical and restrictions on use

Recommended use : Chemical intermediate.

Restrictions on use : This product must not be used in applications other than the above without first seeking the advice of the supplier.

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity (Oral) : Category 4

Specific target organ toxicity - repeated exposure : Category 2 (Kidney)

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : PHYSICAL HAZARDS:
Not classified as a physical hazard under GHS criteria.
HEALTH HAZARDS:
H302 Harmful if swallowed.

H373 May cause damage to organs (Kidney) through prolonged or repeated exposure.
ENVIRONMENTAL HAZARDS:
Not classified as an environmental hazard under GHS criteria.

Precautionary statements : **Prevention:**
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash hands thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
Response:
P301 + P312 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
P330 Rinse mouth.
P314 Get medical advice/ attention if you feel unwell.
Storage:
No precautionary phrases.
Disposal:
P501 Dispose of contents and container to appropriate waste site or reclaimer in accordance with local and national regulations.

Other hazards which do not result in classification
Inhalation of vapours or mists may cause irritation to the respiratory system.
Slightly irritating to respiratory system.
Slightly irritating to the skin.
Slightly irritating to the eye.
Vapours may be irritating to the eye.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Substance name : Ethylene Glycol Antifreeze Grade

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
ethanediol	107-21-1	90 - 100
Diethylene glycol	111-46-6	0 - 10

SECTION 4. FIRST-AID MEASURES

General advice : Not expected to be a health hazard when used under normal conditions.

If inhaled : No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice.

In case of skin contact : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available.
If persistent irritation occurs, obtain medical attention.

In case of eye contact	:	Flush eye with copious quantities of water. Remove contact lenses, if present and easy to do. Continue rinsing. If persistent irritation occurs, obtain medical attention.
If swallowed	:	If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Rinse mouth.
Most important symptoms and effects, both acute and delayed	:	Kidney toxicity may be recognized by blood in the urine or increased or decreased urine flow. Other signs and symptoms can include nausea, vomiting, abdominal cramps, diarrhoea, lumbar pain shortly after ingestion, and possibly narcosis and death. Not considered to be an inhalation hazard under normal conditions of use. Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing. No specific hazards under normal use conditions. Skin irritation signs and symptoms may include a burning sensation, redness, or swelling. Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision. Ingestion may result in nausea, vomiting and/or diarrhoea.
Protection of first-aiders	:	When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.
Notes to physician	:	Call a doctor or poison control center for guidance. Treat symptomatically. May cause significant renal, respiratory, and CNS toxicity. May cause significant acidosis. The preferred treatment is immediate transportation to a medical facility and use of appropriate treatment including possible administration of activated charcoal, gastric lavage and or gastric aspiration. If none of the above are immediately available and a delay of more than one hour is anticipated before such medical attention can be obtained, induction of vomiting may be appropriate using IPECAC syrup (Contraindicated if there are any signs of CNS depression). This should be considered on a case by case basis following specialist advice. Specific other treatments may include ethanol therapy, fomepizole, treatment of acidosis and haemodialysis. Seek specialist advice without delay.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Alcohol-resistant foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable extinguishing media	:	Do not use water in a jet.
Specific hazards during firefighting	:	Material will not burn unless preheated. Carbon monoxide may be evolved if incomplete combustion occurs. Containers exposed to intense heat from fires should be cooled with large quantities of water.
Specific extinguishing methods	:	Standard procedure for chemical fires.
Further information	:	Evacuate the area of all non-essential personnel. Keep adjacent containers cool by spraying with water.
Special protective equipment for firefighters	:	Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Observe all relevant local and international regulations. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Local authorities should be advised if significant spillages cannot be contained. Avoid contact with skin, eyes and clothing.
Environmental precautions	:	Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Use appropriate containment to avoid environmental contamination. Ventilate contaminated area thoroughly.
Methods and materials for containment and cleaning up	:	Contain run-off from residue flush and dispose of properly. Soak up residue with an absorbent such as clay, sand or other suitable material. For small liquid spills (< 1 drum), transfer by mechanical means to a labeled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely. For large liquid spills (> 1 drum), transfer by mechanical

means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely

Additional advice : For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet.
For guidance on disposal of spilled material see Section 13 of this Safety Data Sheet.

SECTION 7. HANDLING AND STORAGE

General Precautions : Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet.
Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
Ensure that all local regulations regarding handling and storage facilities are followed.

Advice on safe handling : Use local exhaust extraction over processing area.
Handle and open container with care in a well-ventilated area.
Do not empty into drains.
When handling product in drums, safety footwear should be worn and proper handling equipment should be used.
Handling Temperature:
Ambient.

Avoidance of contact : Strong oxidising agents.
Strong acids.
Strong bases.

Product Transfer : Keep containers closed when not in use. Do not pressurize drum containers to empty.

Storage

Conditions for safe storage : Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.

Other data : Tanks must be clean, dry and rust-free.
Keep container tightly closed.
Must be stored in a diked (bunded) well- ventilated area, away from sunlight, ignition sources and other sources of heat.
Cleaning, inspection and maintenance of storage tanks is a specialist operation, which requires the implementation of strict procedures and precautions.

Drums should be stacked to a maximum of 3 high.
Storage Temperature:
Ambient.

Packaging material : Suitable material: Stainless steel., Mild steel., Carbon steel
Unsuitable material: Data not available

Container Advice : Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.

Specific use(s) : Not applicable

Ensure that all local regulations regarding handling and storage facilities are followed.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
ethanediol	107-21-1	TWA (Vapour)	25 ppm	ACGIH
		STEL (Vapour)	50 ppm	ACGIH
		STEL (Inhalable fraction, Aerosol only)	10 mg/m3	ACGIH

Biological occupational exposure limits

No biological limit allocated.

Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.
Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.
National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/
Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/
Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances http://www.hse.gov.uk/
Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA) , Germany

http://www.dguv.de/inhalt/index.jsp
L'Institut National de Recherche et de Securité, (INRS), France http://www.inrs.fr/accueil

Engineering measures : Adequate ventilation to control airborne concentrations.
Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.
Eye washes and showers for emergency use.
The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances.
Appropriate measures include:

General Information:
Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned.
Practice good housekeeping.
Define procedures for safe handling and maintenance of controls.
Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.
Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.
Drain down system prior to equipment break-in or maintenance.
Retain drain downs in sealed storage pending disposal or subsequent recycle.

Personal protective equipment

Respiratory protection : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation.
Check with respiratory protective equipment suppliers.
Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus.
Where air-filtering respirators are suitable, select an appropriate combination of mask and filter.
If air-filtering respirators are suitable for conditions of use:
Select a filter suitable for the combination of organic gases and vapours and particles [Type A/Type P boiling point >65°C (149°F)].

Hand protection
Remarks : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374,

US: F739) made from the following materials may provide suitable chemical protection. Longer term protection: Nitrile rubber gloves. Incidental contact/Splash protection: PVC or neoprene rubber gloves. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

Eye protection : If material is handled such that it could be splashed into eyes, protective eyewear is recommended.

Skin and body protection : Skin protection is not ordinarily required beyond standard work clothes.
It is good practice to wear chemical resistant gloves.

Thermal hazards : Not applicable

Protective measures : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
The following information, while appropriate for the product is general in nature. The selection of Personal Protective Equipment will vary depending on the conditions of use.

Hygiene measures : Wash hands before eating, drinking, smoking and using the toilet.
Launder contaminated clothing before re-use.

Environmental exposure controls

General advice : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.
Minimise release to the environment. An environmental assessment must be made to ensure compliance with local envi-

ronmental legislation.
Information on accidental release measures are to be found in section 6.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Slightly viscous liquid.
Colour	:	colourless
Odour	:	mild
Odour Threshold	:	25 ppm
pH	:	Not applicable
Melting / freezing point	:	-13 °C / 9 °F
Boiling point/boiling range	:	190 - 240 °C / 374 - 464 °F
Flash point	:	115 °C / 239 °F Method: ASTM D-93 / PMCC
Evaporation rate	:	0.01 Method: ASTM D 3539, nBuAc=1
Flammability		
Flammability (solid, gas)	:	Not applicable
Lower explosion limit and upper explosion limit / flammability limit		
Upper explosion limit	:	28 %(V)
Lower explosion limit	:	3.2 %(V)
Vapour pressure	:	< 10 Pa (20 °C / 68 °F)
Relative vapour density	:	Data not available
Relative density	:	1.115 Method: ASTM D4052
Density	:	Typical 1,113 kg/m3 (20 °C / 68 °F)Method: ASTM D4052
Solubility(ies)		
Water solubility	:	completely soluble
Partition coefficient: n-octanol/water	:	log Pow: -1.93 (20 °C / 68 °F) Data not available
Auto-ignition temperature	:	Data not available

Decomposition temperature	:	Data not available
Viscosity		
Viscosity, dynamic	:	Data not available
Viscosity, kinematic	:	18.8 mm2/s (20 °C / 68 °F) Method: ASTM D445
Explosive properties	:	Not applicable
Oxidizing properties	:	Not applicable
Surface tension	:	50.5 mN/m
Conductivity	:	Data not available
Molecular weight	:	62 g/mol

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.
Chemical stability	:	No hazardous reaction is expected when handled and stored according to provisions Oxidises on contact with air.
Possibility of hazardous reactions	:	None known.
Conditions to avoid	:	Extremes of temperature and direct sunlight. Product cannot ignite due to static electricity.
Incompatible materials	:	Strong oxidising agents. Strong acids. Strong bases.
Hazardous decomposition products	:	Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

SECTION 11. TOXICOLOGICAL INFORMATION

Basis for assessment	:	Information given is based on product testing.

Information on likely routes of exposure
Skin and eye contact are the primary routes of exposure although exposure may occur through inhalation or following accidental ingestion.

Acute toxicity

Components:

ethanediol:

Acute oral toxicity	:	LD 50 (Rat, male and female): > 2,000 mg/kg Method: Acceptable non-standard method. Remarks: Harmful if swallowed. There is a marked difference in acute oral toxicity between rodents and man, man being more susceptible than rodents. The estimated fatal dose for man is 100 milliliters (1/2 cup). This material has also been shown to be toxic and potentially lethal by ingestion to cats and dogs.
Acute inhalation toxicity	:	LC 50 (Rat, male and female): > 2.5 mg/l Exposure time: 6 h Test atmosphere: Aerosol Method: Literature data Remarks: LC50 > 1.0 - <= 5.0 mg/l LC50 greater than near-saturated vapour concentration. Based on available data, the classification criteria are not met.
Acute dermal toxicity	:	LD 50 (Mouse, male and female): > 2,000 mg/kg Method: Literature data Remarks: Based on available data, the classification criteria are not met.

Diethylene glycol:

Acute oral toxicity	:	LD 50 (Rat, male and female): > 5,000 mg/kg Method: Literature data Remarks: Based on available data, the classification criteria are not met. There is a marked difference in acute oral toxicity between rodents and man, man being more susceptible than rodents. The estimated fatal dose for man is 100 milliliters (1/2 cup). This material has also been shown to be toxic and potentially lethal by ingestion to cats and dogs.
Acute inhalation toxicity	:	LC 50 (Rat): > 1 -<= 5 mg/l Exposure time: 4 h Test atmosphere: Aerosol Method: Literature data Remarks: LC50 greater than near-saturated vapour concentration. Based on available data, the classification criteria are not met.
Acute dermal toxicity	:	LD 50 (Rabbit): > 2,000 mg/kg Method: Literature data Remarks: Based on available data, the classification criteria are not met.

Skin corrosion/irritation

Components:

ethanediol:
Species: Rabbit
Method: Acceptable non-standard method.
Remarks: Slightly irritating to skin.
Insufficient to classify.

Diethylene glycol:
Species: Rabbit
Method: Literature data
Remarks: Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation

Components:

ethanediol:
Species: Rabbit
Method: Acceptable non-standard method.
Remarks: Slightly irritating to the eye.
Insufficient to classify.

Diethylene glycol:
Species: Rabbit
Method: Literature data
Remarks: Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation

Components:

ethanediol:
Species: Guinea pig
Method: Literature data
Remarks: Based on available data, the classification criteria are not met.

Diethylene glycol:
Species: Guinea pig
Method: Tested according to Annex V of Directive 67/548/EEC.
Remarks: Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Components:

ethanediol:
Genotoxicity in vitro : Method: OECD Test Guideline 471
Remarks: Based on data from similar materials

: Method: Acceptable non-standard method.

Remarks: Based on data from similar materials

: Method: Literature data
Remarks: Based on data from similar materials

Genotoxicity in vivo : Species: Rat
Method: Literature data
Remarks: Based on available data, the classification criteria are not met.

Germ cell mutagenicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Diethylene glycol:
Genotoxicity in vitro : Method: OECD Test Guideline 471
Remarks: Based on available data, the classification criteria are not met.

: Method: OECD Test Guideline 473
Remarks: Based on available data, the classification criteria are not met.

: Method: OECD Test Guideline 479
Remarks: Based on available data, the classification criteria are not met.

Genotoxicity in vivo : Species: Mouse
Method: OECD Test Guideline 474
Remarks: Based on available data, the classification criteria are not met.

Germ cell mutagenicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Carcinogenicity

Components:

ethanediol:
Species: Mouse, (male and female)
Application Route: Oral
Method: Literature data
Remarks: Based on available data, the classification criteria are not met.

Carcinogenicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Diethylene glycol:
Species: Rat, (male and female)
Application Route: Oral
Method: Literature data
Remarks: Based on available data, the classification criteria are not met.
Tumours produced in animals are not considered relevant to humans.

Carcinogenicity - Assessment	:	This product does not meet the criteria for classification in categories 1A/1B.
IARC		No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA		No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
NTP		No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Components:

ethanediol:

Effects on fertility	:	Species: Rat Sex: male and female Application Route: Oral Method: Literature data Remarks: Based on available data, the classification criteria are not met.
Effects on foetal development	:	Species: Rat, male and female Application Route: Oral Method: Literature data Remarks: Based on available data, the classification criteria are not met. Causes foetotoxicity in animals; considered to be secondary to maternal toxicity.
Reproductive toxicity - Assessment	:	This product does not meet the criteria for classification in categories 1A/1B.

Diethylene glycol:

Effects on fertility	:	Species: Mouse Sex: male and female Application Route: Oral Method: Acceptable non-standard method. Remarks: Based on available data, the classification criteria are not met.
Effects on foetal development	:	Species: Rabbit, female Application Route: Oral Method: OECD Test Guideline 414

Remarks: Based on available data, the classification criteria are not met.

Reproductive toxicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

STOT - single exposure

Components:

ethanediol:
Remarks: Inhalation of vapours or mists may cause irritation to the respiratory system.
Based on available data, the classification criteria are not met.
Ingestion may cause drowsiness and dizziness.

Diethylene glycol:
Remarks: Based on available data, the classification criteria are not met.
Inhalation of vapours or mists may cause irritation to the respiratory system.
Ingestion may cause drowsiness and dizziness.

STOT - repeated exposure

Components:

ethanediol:
Exposure routes: Oral
Target Organs: Kidney
Remarks: May cause damage to organs or organ systems through prolonged or repeated exposure.

Diethylene glycol:
Remarks: Based on available data, the classification criteria are not met.

Repeated dose toxicity

Components:

ethanediol:
Species: Rat, male
Application Route: Oral
Method: Test(s) equivalent or similar to OECD Test Guideline 408
Target Organs: Kidney

Diethylene glycol:
Species: Rat, male and female
Application Route: Oral
Method: Acceptable non-standard method.
Target Organs: No specific target organs noted

Species: Dog, male
Application Route: Dermal
Method: OECD Test Guideline 410
Target Organs: No specific target organs noted

Aspiration toxicity

Components:

ethanediol:
Based on available data, the classification criteria are not met.

Diethylene glycol:
Based on available data, the classification criteria are not met.

Further information

Components:

ethanediol:
Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

Diethylene glycol:
Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

SECTION 12. ECOLOGICAL INFORMATION

Basis for assessment : Information given is based on product testing.

Ecotoxicity

Components:

ethanediol:

Toxicity to fish (Acute toxicity) : LC50 (Pimephales promelas (fathead minnow)): 72,860 mg/l
Exposure time: 96 h
Method: Other guideline method.
Remarks: Practically non toxic:
LC/EC/IC50 > 100 mg/l

Toxicity to crustacean (Acute toxicity) : EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202
Remarks: Practically non toxic:
LC/EC/IC50 > 100 mg/l

Toxicity to algae/aquatic plants (Acute toxicity) : EC50 (Pseudokirchneriella subcapitata (algae)): 6,500 - 13,000 mg/l
Exposure time: 96 h
Method: Other guideline method.
Remarks: Practically non toxic:
LC/EC/IC50 > 100 mg/l

Toxicity to fish (Chronic toxicity) : NOEC (Pimephales promelas (fathead minnow)): 15,380 mg/l
Exposure time: 7 d
Method: Other guideline method.
Remarks: NOEC/NOEL > 100 mg/l

Toxicity to crustacean(Chronic toxicity)	:	NOEC (Chironomus sp. (midge)): 8,590 mg/l Exposure time: 7 d Method: Other guideline method. Remarks: NOEC/NOEL > 100 mg/l
Toxicity to bacteria	:	EC20 (Activated sludge, domestic waste): > 1,995 mg/l Exposure time: 0.5 h Method: Other guideline method. Remarks: Practically non toxic: LC/EC/IC50 > 100 mg/l

Diethylene glycol:

Toxicity to fish (Acute toxicity)	:	LC50 (Pimephales promelas (fathead minnow)): 75,200 mg/l Exposure time: 96 h Method: Literature data. Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to crustacean (Acute toxicity)	:	EC50 (Daphnia magna (Water flea)): > 10,000 mg/l Exposure time: 24 h Method: Other guideline method. Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to algae/aquatic plants (Acute toxicity)	:	EC50 (Scenedesmus quadricauda (Green algae)): 2,700 mg/l Exposure time: 192 h Method: Information given is based on data obtained from similar substances. Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): 15,380 mg/l Exposure time: 7 d Method: Other guideline method. Remarks: NOEC/NOEL > 100 mg/l
Toxicity to crustacean(Chronic toxicity)	:	NOEC (Ceriodaphnia dubia (Water flea)): 8,590 mg/l Exposure time: 7 d Method: Other guideline method. Remarks: NOEC/NOEL > 100 mg/l
Toxicity to bacteria	:	EC20 (Activated sludge, domestic waste): > 1,995 mg/l Exposure time: 0.5 h Method: Other guideline method. Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l

Persistence and degradability

Components:

ethanediol:

Biodegradability	:	Biodegradation: 90 - 100 %

Exposure time: 10 d
Method: OECD Test Guideline 301A
Remarks: Readily biodegradable.
Not Persistent per IMO criteria.
International Oil Pollution Compensation (IOPC) Fund definition: “A non-persistent oil is oil, which, at the time of shipment, consists of hydrocarbon fractions, (a) at least 50% of which, by volume, distills at a temperature of 340ºC (645ºF) and (b) at least 95% of which, by volume, distils at a temperature of 370ºC (700ºF) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

Diethylene glycol:
Biodegradability : Biodegradation: 70 - 80 %
Exposure time: 28 d
Method: OECD Test Guideline 301B
Remarks: Readily biodegradable.
Oxidises rapidly by photo-chemical reactions in air.

Bioaccumulative potential

Partition coefficient: n-octanol/water : log Pow: -1.93 (20 °C)
Remarks: Data not available

Components:

ethanediol:
Bioaccumulation : Remarks: Does not have the potential to bioaccumulate significantly.

Diethylene glycol:
Bioaccumulation : Remarks: Does not bioaccumulate significantly.

Mobility in soil

Components:

ethanediol:
Mobility : Remarks: Disperses in water.
If product enters soil, one or more constituents will be highly mobile and may contaminate groundwater.

Diethylene glycol:
Mobility : Remarks: If the product enters soil, one or more constituents will or may be mobile and may contaminate groundwater.
Dissolves in water.

Other adverse effects

Components:

ethanediol:
Results of PBT and vPvB assessment : The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not consid-

ered to be PBT or vPvB.

Additional ecological information : Does not have ozone depletion potential.

Diethylene glycol:
Results of PBT and vPvB assessment : The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB.

Additional ecological information : Data not available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Recover or recycle if possible.
It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.
Remove all packaging for recovery or waste disposal.
Waste product should not be allowed to contaminate soil or ground water, or be disposed of into the environment.
Do not dispose of tank water bottoms by allowing them to drain into the ground. This will result in soil and groundwater contamination.
Do not dispose into the environment, in drains or in water courses
Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.

Disposal should be in accordance with applicable regional, national, and local laws and regulations.
Local regulations may be more stringent than regional or national requirements and must be complied with.

MARPOL - see International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) which provides technical aspects at controlling pollutions from ships.

Contaminated packaging : Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand.

SECTION 14. TRANSPORT INFORMATION

National Regulations

TDG
Not regulated as a dangerous good

International Regulations

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Maritime transport in bulk according to IMO instruments

Pollution category	:	Z
Ship type	:	3
Product name	:	Ethylene glycol

Special precautions for user

Remarks	:	Special Precautions: Refer to Section 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.
Additional Information	**:**	This product may be transported under nitrogen blanketing. Nitrogen is an odourless and invisible gas. Exposure to nitrogen enriched atmospheres displaces available oxygen which may cause asphyxiation or death. Personnel must observe strict safety precautions when involved with a confined space entry. Transport in bulk according to Annex II of Marpol and the IBC Code

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all the information required by the HPR.

The components of this product are reported in the following inventories:

AIIC	:	Listed
DSL	:	Listed
IECSC	:	Listed

ENCS	:	Listed
KECI	:	Listed
NZIoC	:	Listed
PICCS	:	Listed
TSCA	:	Listed

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

A vertical bar (|) in the left margin indicates an amendment from the previous version.

Sources of key data used to compile the Safety Data Sheet	:	The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID date base, EC 1272 regulation, etc).
Revision Date	:	2022-07-13

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

CA / EN

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

Ultra Low Sulfur Fuel Oil/ECA Marine Fuel Oil

Version	Revision Date:	SDS Number:	Print Date: 09/05/2022
2.0	08/05/2021	800010031915	Date of last issue: 02/05/2018

SECTION 1. IDENTIFICATION

Product name : Ultra Low Sulfur Fuel Oil/ECA Marine Fuel Oil

Product code : X3405

CAS-No. : 68334-30-5

Manufacturer or supplier's details

Company : **Shell Chemical LP**
PO Box 576
HOUSTON TX 77001
USA

SDS Request : 1-800-240-6737

Customer Service : 1-855-697-4355

Emergency telephone number

Chemtrec Domestic (24 hr) : 1-800-424-9300

Chemtrec International (24 hr) : 1-703-527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Diesel fuel

Restrictions on use :
This product must not be used in applications other than those listed in Section 1 without first seeking the advice of the supplier., This product is not to be used as a solvent or cleaning agent; for lighting or brightening fires; as a skin cleanser.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids : Category 3

Aspiration hazard : Category 1

Acute toxicity (Inhalation) : Category 4

Skin irritation : Category 2

Carcinogenicity : Category 2

Specific target organ toxicity - repeated exposure : Category 2 (Blood, thymus, Liver)

Long-term (chronic) aquatic hazard : Category 2

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements :

PHYSICAL HAZARDS:
H226 Flammable liquid and vapour.
HEALTH HAZARDS:
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H332 Harmful if inhaled.
H373 May cause damage to organs (Blood, Liver, thymus) through prolonged or repeated exposure.
H351 Suspected of causing cancer.
ENVIRONMENTAL HAZARDS:
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements :

Prevention:

P201 + P202 Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash hands thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a

POISON CENTER or doctor/ physician if you feel unwell.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P314 Get medical advice/ attention if you feel unwell.
P321 Specific treatment (see supplemental first aid instructions on this label).
P331 Do NOT induce vomiting.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P370 + P378 In case of fire: Use appropriate media to extinguish.
P391 Collect spillage.

Storage:

P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards which do not result in classification

May ignite on surfaces at temperatures above auto-ignition temperature.
Vapour in the headspace of tanks and containers may ignite and explode at temperatures exceeding auto-ignition temperature, where vapour concentrations are within the flammability range.
This material is a static accumulator.
Even with proper grounding and bonding, this material can still accumulate an electrostatic charge.
If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.
This product is intended for use in closed systems only.
The classification of this material is based on OSHA HCS 2012 criteria.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Chemical nature : May contain catalytically cracked oils in which polycyclic aromatic compounds, mainly 3-ring but some 4- to 6-ring species are present.

May contain cetane improver (Ethyl Hexyl Nitrate) at <0.2% v/v.
May also contain several additives at <0.1% v/v each.

Hazardous components

Chemical name	Synonyms	CAS-No.	Concentration (% w/w)
Fuels, diesel	Fuels, diesel (Flash-point not more than 60°C)	68334-30-5	<= 100

Dyes and markers can be used to indicate tax status and prevent fraud.

Further information

Contains:

Chemical name	Identification number	Concentration (% w/w)
Cumene	98-82-8	0 - 0.5
Naphthalene	91-20-3	0 - 0.5

SECTION 4. FIRST-AID MEASURES

General advice : Not expected to be a health hazard when used under normal conditions.

If inhaled : Call emergency number for your location / facility.
Remove to fresh air. Do not attempt to rescue the victim unless proper respiratory protection is worn. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting, or unresponsive, give 100% oxygen with rescue breathing or Cardio-Pulmonary Resuscitation as required and transport to the nearest medical facility.

In case of skin contact : Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.
When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop.
Obtain medical attention even in the absence of apparent wounds.

In case of eye contact : Flush eye with copious quantities of water.
Remove contact lenses, if present and easy to do. Continue rinsing.
If persistent irritation occurs, obtain medical attention.

If swallowed : Call emergency number for your location / facility.
If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.
If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing.

Most important symptoms and effects, both acute and delayed : Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing.
Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters.
Eye irritation signs and symptoms may include a burning sen-

sation, redness, swelling, and/or blurred vision.
If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever.
If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing.
Liver damage may be indicated by loss of appetite, jaundice (yellowish skin and eye colour), fatigue, bleeding or easy bruising and sometimes pain and swelling in the upper right abdomen.

Damage to blood-forming organs may be evidenced by: a) fatigue and anaemia (RBC), b) decreased resistance to infection, and/or excessive bruising and bleeding (platelet effect).

Protection of first-aiders : When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.

Indication of any immediate medical attention and special treatment needed : Call a doctor or poison control center for guidance.
Potential for chemical pneumonitis.
Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.

Unsuitable extinguishing media : Do not use direct water jets on the burning product as they could cause a steam explosion and spread of the fire.
Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

Specific hazards during fire-fighting : Hazardous combustion products may include:
A complex mixture of airborne solid and liquid particulates and gases (smoke).
Oxides of sulphur.
Unidentified organic and inorganic compounds.
Carbon monoxide may be evolved if incomplete combustion occurs.
Will float and can be reignited on surface water.
Flammable vapours may be present even at temperatures below the flash point.
The vapour is heavier than air, spreads along the ground and distant ignition is possible.

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Further information : Clear fire area of all non-emergency personnel.

Keep adjacent containers cool by spraying with water.
If possible remove containers from the danger zone.
If the fire cannot be extinguished the only course of action is to evacuate immediately.
Contain residual material at affected sites to prevent material from entering drains (sewers), ditches, and waterways.

Special protective equipment for firefighters : Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Do not breathe fumes, vapour.
Do not operate electrical equipment.
Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area and evacuate all personnel. Attempt to disperse the gas or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Monitor area with combustible gas meter.

Environmental precautions : Take measures to minimise the effects on groundwater.
Contain residual material at affected sites to prevent material from entering drains (sewers), ditches, and waterways.
Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers.

Methods and materials for containment and cleaning up : For small liquid spills (< 1 drum), transfer by mechanical means to a labeled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely
Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers.

Observe all relevant local and international regulations.
Evacuate the area of all non-essential personnel.
Ventilate contaminated area thoroughly.

Additional advice : For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet.
Notify authorities if any exposure to the general public or the

environment occurs or is likely to occur.
For guidance on disposal of spilled material see Section 13 of this Safety Data Sheet.
Local authorities should be advised if significant spillages cannot be contained.
Maritime spillages should be dealt with using a Shipboard Oil Pollution Emergency Plan (SOPEP), as required by MARPOL Annex 1 Regulation 26.

U.S. regulations may require reporting releases of this material to the environment which exceed the reportable quantity (refer to Section 15) to the National Response Center at (800) 424-8802.
Under Section 311 of the Clean Water Act (CWA) this material is considered an oil. As such, spills into surface waters must be reported to the National Response Center at (800) 424-8802.
This material is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Petroleum Exclusion. Therefore, releases to the environment may not be reportable under CERCLA.

SECTION 7. HANDLING AND STORAGE

Technical measures	:	Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. Air-dry contaminated clothing in a well-ventilated area before laundering. Prevent spillages. Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Never siphon by mouth. Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse.
Advice on safe handling	:	Ensure that all local regulations regarding handling and storage facilities are followed. Avoid inhaling vapour and/or mists. Avoid prolonged or repeated contact with skin. When using do not eat or drink. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Earth all equipment. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.

Avoidance of contact	:	Strong oxidising agents.
Product Transfer	:	Avoid splash filling Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes. Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes. Keep containers closed when not in use. Contamination resulting from product transfer may give rise to light hydrocarbon vapour in the headspace of tanks that have previously contained gasoline. This vapour may explode if there is a source of ignition. Partly filled containers present a greater hazard than those that are full, therefore handling, transfer and sampling activities need special care. Even with proper grounding and bonding, this material can still accumulate an electrostatic charge. If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur. Be aware of handling operations that may give rise to additional hazards that result from the accumulation of static charges. These include but are not limited to pumping (especially turbulent flow), mixing, filtering, splash filling, cleaning and filling of tanks and containers, sampling, switch loading, gauging, vacuum truck operations, and mechanical movements. These activities may lead to static discharge e.g. spark formation. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (≤ 1 m/s until fill pipe submerged to twice its diameter, then ≤ 7 m/s). Avoid splash filling. Do NOT use compressed air for filling, discharging, or handling operations.
Further information on storage stability	:	Drum and small container storage: Drums should be stacked to a maximum of 3 high. Use properly labeled and closable containers. Tank storage: Tanks must be specifically designed for use with this product. Bulk storage tanks should be diked (bunded). Locate tanks away from heat and other sources of ignition. Must be stored in a diked (bunded) well- ventilated area, away from sunlight, ignition sources and other sources of heat. Vapours from tanks should not be released to atmosphere. Breathing losses during storage should be controlled by a suitable vapour treatment system. The vapour is heavier than air. Beware of accumulation in pits and confined spaces. Keep container tightly closed and in a cool, well-ventilated place. Keep in a cool place. Electrostatic charges will be generated during pumping. Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment to reduce the risk. The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable. Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.

Keep in a bunded area with a sealed (low permeability) floor, to provide containment against spillage.
Prevent ingress of water.

Specific use(s) : See additional references that provide safe handling practices for liquids that are determined to be static accumulators: American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practices on Static Electricity).
IEC/TS 60079-32-1: Electrostatic hazards, guidance
Ensure that all local regulations regarding handling and storage facilities are followed.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Fuels, diesel	68334-30-5	TWA (Inhalable fraction and vapor)	100 mg/m3 (total hydrocarbons)	ACGIH
Cumene	98-82-8	TWA	50 ppm 245 mg/m3	OSHA Z-1
Cumene		TWA	5 ppm	ACGIH
Naphthalene	91-20-3	TWA	10 ppm 50 mg/m3	OSHA Z-1
Naphthalene		TWA	10 ppm	ACGIH

Biological occupational exposure limits

No biological limit allocated.

Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.
Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.
National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/
Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/
L'Institut National de Recherche et de Securité, (INRS), France http://www.inrs.fr/accueil
Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances http://www.hse.gov.uk/
Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA) , Germany http://www.dguv.de/inhalt/index.jsp

Engineering measures : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:
Use sealed systems as far as possible.
Firewater monitors and deluge systems are recommended.
Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits.
Local exhaust ventilation is recommended.
Eye washes and showers for emergency use.

General Information:

Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned.
Practice good housekeeping.
Define procedures for safe handling and maintenance of controls.
Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.
Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.
Drain down system prior to equipment break-in or maintenance.
Retain drain downs in sealed storage pending disposal or subsequent recycle.
Do not ingest. If swallowed, then seek immediate medical assistance

Personal protective equipment

Respiratory protection : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation.
Check with respiratory protective equipment suppliers.
Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus.
Where air-filtering respirators are suitable, select an appropriate combination of mask and filter.

Select a filter suitable for the combination of organic gases and vapours and particles [Type A/Type P boiling point >65°C (149°F)].

Hand protection

Remarks	:	Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. When prolonged or frequent repeated contact occurs. Nitrile rubber. For incidental contact/splash protection Neoprene, PVC gloves may be suitable. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
Eye protection	:	If material is handled such that it could be splashed into eyes, protective eyewear is recommended. If a local risk assessment deems it so then chemical splash goggles may not be required and safety glasses may provide adequate eye protection.
Skin and body protection	:	Wear chemical resistant gloves/gauntlets and boots. Where risk of splashing, also wear an apron.
Protective measures	:	Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
Thermal hazards	:	Not applicable
Hygiene measures	:	Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping. Define procedures for safe handling and maintenance of controls. Educate and train workers in the hazards and control measures relevant to normal activities associated with this product. Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation. Drain down system prior to equipment break-in or mainte-

nance.
Retain drain downs in sealed storage pending disposal or subsequent recycle.
Do not ingest. If swallowed, then seek immediate medical assistance.
If repeated and/or prolonged skin exposure to the substance is likely, then wear suitable gloves tested to EN374 and provide employee skin care programmes.

Environmental exposure controls

General advice : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.
Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.
Information on accidental release measures are to be found in section 6.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	Amber or as dyed
Odour	:	Strong hydrocarbon
Odour Threshold	:	Data not available
pH	:	Not applicable
Melting point/freezing point	:	Data not available
Initial boiling point and boiling range	:	170 - 390 °C / 338 - 734 °F
Flash point	:	55 - 75 °C / 131 - 167 °F
Evaporation rate	:	Data not available
Flammability (solid, gas)	:	Not applicable
Upper explosion limit / upper flammability limit	:	6 %(V)
Lower explosion limit / Lower flammability limit	:	1 %(V)
Vapour pressure	:	<= 0.4 kPa (38 °C / 100 °F)
		<= 0.4 kPa (50 °C / 122 °F)

Relative density	:	Data not available
Density	:	820 - 860 kg/m3 (15 °C / 59 °F) Method: ASTM D4052
Solubility(ies)		
Water solubility	:	negligible
Solubility in other solvents	:	Data not available
Partition coefficient: n-octanol/water	:	log Pow: ca. 2 - 15
Auto-ignition temperature	:	> 220 °C / 428 °F
Decomposition temperature	:	Data not available
Viscosity		
Viscosity, kinematic	:	2 - 4.5 mm2/s (40 °C / 104 °F) Method: ASTM D445
Explosive properties	:	Classification Code: Not classified.
Oxidizing properties	:	Not applicable
Conductivity	:	Low conductivity: < 100 pS/m, The conductivity of this material makes it a static accumulator., A liquid is typically considered nonconductive if its conductivity is below 100 pS/m and is considered semi-conductive if its conductivity is below 10,000 pS/m., Whether a liquid is nonconductive or semiconductive, the precautions are the same., A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.
Chemical stability	:	Stable under normal use conditions.
Possibility of hazardous reactions	:	No hazardous reaction is expected when handled and stored according to provisions
Conditions to avoid	:	Avoid heat, sparks, open flames and other ignition sources. In certain circumstances product can ignite due to static electricity.
Incompatible materials	:	Strong oxidising agents.

Hazardous decomposition products	:	Hazardous decomposition products are not expected to form during normal storage. Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

SECTION 11. TOXICOLOGICAL INFORMATION

Basis for assessment	:	Information given is based on product data, a knowledge of the components and the toxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Information on likely routes of exposure
Skin and eye contact are the primary routes of exposure although exposure may occur through inhalation or following accidental ingestion.

Acute toxicity

Product:

Acute oral toxicity	:	LD50 (rat): > 5,000 mg/kg Remarks: Low toxicity:
Acute inhalation toxicity	:	LC 50 (rat): >1-<=5 mg/l Exposure time: 4 h Remarks: Harmful if inhaled.
Acute dermal toxicity	:	LD 50 (Rabbit): > 2,000 mg/kg Remarks: Low toxicity:

Skin corrosion/irritation

Product:
Remarks: Irritating to skin.

Serious eye damage/eye irritation

Product:
Remarks: Slightly irritating to the eye., Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation

Product:
Remarks: Not a sensitiser.
Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Product:

: Remarks: Positive in in-vitro, but negative in in-vivo mutagenicity assays.

Carcinogenicity

Product:

Remarks: Limited evidence of carcinogenic effect, Repeated skin contact has resulted in irritation and skin cancer in animals.

IARC	Group 2B: Possibly carcinogenic to humans	
	Cumene	98-82-8
	Naphthalene	91-20-3
ACGIH	Confirmed animal carcinogen with unknown relevance to humans	
	Fuels, diesel	68334-30-5
	Naphthalene	91-20-3
OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.	
NTP	Reasonably anticipated to be a human carcinogen	
	Cumene	98-82-8
	Naphthalene	91-20-3

Reproductive toxicity

Product:

: Remarks: Not a developmental toxicant., Based on available data, the classification criteria are not met., Does not impair fertility.

STOT - single exposure

Product:

Remarks: Not classified.

STOT - repeated exposure

Product:

Target Organs: Blood, thymus, Liver
Remarks: May cause damage to organs or organ systems through prolonged or repeated exposure.

Aspiration toxicity

Product:

Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

Further information

Product:

Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

SECTION 12. ECOLOGICAL INFORMATION

Basis for assessment : Information given is based on a knowledge of the components and the ecotoxicology of similar products.
Fuels are typically made from blending several refinery streams. Ecotoxicological studies have been carried out on a variety of hydrocarbon blends and streams but not those containing additives.
Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Ecotoxicity

Product:

Toxicity to fish (Acute toxicity) :
Remarks: LL/EL/IL50 > 1 <= 10 mg/l
Toxic

Toxicity to daphnia and other aquatic invertebrates (Acute toxicity) :
Remarks: LL/EL/IL50 > 1 <= 10 mg/l
Toxic

Toxicity to algae (Acute toxicity) :
Remarks: LL/EL/IL50 > 1 <= 10 mg/l
Toxic

Toxicity to fish (Chronic toxicity) : Remarks: Data not available

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Remarks: Data not available

Toxicity to microorganisms (Acute toxicity) : Remarks: LL/EL/IL50 > 100 mg/l
Practically non toxic:
Based on available data, the classification criteria are not met.

Persistence and degradability

Product:

Biodegradability : Remarks: Readily biodegradable.
Not Persistent per IMO criteria.
International Oil Pollution Compensation (IOPC) Fund definition: “A non-persistent oil is oil, which, at the time of shipment, consists of hydrocarbon fractions, (a) at least 50% of which, by volume, distills at a temperature of 340ºC (645ºF) and (b) at least 95% of which, by volume, distils at a temperature of 370ºC (700ºF) when tested by the ASTM Method D-86/78 or any subsequent revision thereof."

Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Contains constituents with the potential to bioaccumulate.

Mobility in soil

Product:

Mobility : Remarks: Partly evaporates from water or soil surfaces, but a significant proportion will remain after one day.
If product enters soil, one or more constituents will be mobile and may contaminate groundwater.
Large volumes may penetrate soil and could contaminate groundwater.
Floats on water.

Other adverse effects

Product:

Additional ecological information : Films formed on water may affect oxygen transfer and damage organisms.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Recover or recycle if possible.
Send to drum recoverer or metal reclaimer.It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.
Drain container thoroughly.Do not dispose into the environment, in drains or in water courses

After draining, vent in a safe place away from sparks and fire.Do not dispose of tank water bottoms by allowing them to drain into the ground. This will result in soil and groundwater contamination.
Residues may cause an explosion hazard. Do not puncture, cut or weld uncleaned drums.Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
MARPOL - see International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) which provides technical aspects at controlling pollutions from ships.

Contaminated packaging : Residues may cause an explosion hazard if heated above the flash point. Do not puncture, cut or weld uncleaned drums.
Do not pollute the soil, water or environment with the waste container.
Comply with any local recovery or waste disposal regulations.
Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand.

Local legislation
Remarks : Disposal should be in accordance with applicable regional, national, and local laws and regulations.
Local regulations may be more stringent than regional or national requirements and must be complied with.

SECTION 14. TRANSPORT INFORMATION

National Regulations

US Department of Transportation Classification (49 CFR Parts 171-180)

UN/ID/NA number	:	NA 1993
Proper shipping name	:	Diesel fuel
Class	:	CBL
Packing group	:	III
Labels	:	NON
ERG Code	:	128
Marine pollutant	:	no
Remarks	:	This material is an 'OIL' under 49 CFR Part 130 when transported in a container of 3500 gallon capacity or greater.Reclassified as combustible liquid for land transportation within the US per 49CFR 173.120(b)(2).This material is not regulated under 49 CFR if in a container of 119 gallon capacity or less.

International Regulations

IATA-DGR

UN/ID No.	:	UN 1202
Proper shipping name	:	DIESEL FUEL

Class	:	3
Packing group	:	III
Labels	:	3

IMDG-Code

UN number	:	UN 1202
Proper shipping name	:	DIESEL FUEL
Class	:	3
Packing group	:	III
Labels	:	3
Marine pollutant	:	yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied. MARPOL Annex 1 rules apply for bulk shipments by sea.

Special precautions for user

Remarks	:	Special Precautions: Refer to Section 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Naphthalene	**91-20-3**	**100**	*****
Cumene	**98-82-8**	**5000**	*****

*: Calculated RQ exceeds reasonably attainable upper limit.
Shell classifies this material as an "oil" under the CERCLA Petroleum Exclusion, therefore releases to the environment are not reportable under CERCLA.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

Components	CAS-No.	Component TPQ (lbs)

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 311/312 Hazards	:	Fire Hazard Immediate (Acute) Health Hazard
SARA 313	:	The following components are subject to reporting levels established by SARA Title III, Section 313:

Naphthalene	91-20-3	0.5 %

Clean Water Act

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Naphthalene	91-20-3	0.5 %

US State Regulations

Pennsylvania Right To Know

Fuels, diesel	68334-30-5
Cumene	98-82-8
Naphthalene	91-20-3

New Jersey Right To Know

Naphthalene	91-20-3

California Prop. 65

WARNING! This product contains a chemical known to the State of California to cause cancer.

Other regulations:

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

IARC has classified diesel exhaust emissions as a Class 1 carcinogen - carcinogenic to humans. Steps should be taken to prevent personal exposure to diesel exhaust emissions.

SECTION 16. OTHER INFORMATION

Further information

NFPA Rating (Health, Fire, Reactivity)	2, 2, 0

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
OSHA Z-1 / TWA	:	8-hour time weighted average
Abbreviations and Acronyms	:	The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites. ACGIH = American Conference of Governmental Industrial Hygienists ADR = European Agreement concerning the International Carriage of Dangerous Goods by Road AICS = Australian Inventory of Chemical Substances ASTM = American Society for Testing and Materials BEL = Biological exposure limits BTEX = Benzene, Toluene, Ethylbenzene, Xylenes CAS = Chemical Abstracts Service CEFIC = European Chemical Industry Council CLP = Classification Packaging and Labelling

COC = Cleveland Open-Cup
DIN = Deutsches Institut fur Normung
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
DSL = Canada Domestic Substance List
EC = European Commission
EC50 = Effective Concentration fifty
ECETOC = European Center on Ecotoxicology and Toxicology Of Chemicals
ECHA = European Chemicals Agency
EINECS = The European Inventory of Existing Commercial Chemical Substances
EL50 = Effective Loading fifty
ENCS = Japanese Existing and New Chemical Substances Inventory
EWC = European Waste Code
GHS = Globally Harmonised System of Classification and Labelling of Chemicals
IARC = International Agency for Research on Cancer
IATA = International Air Transport Association
IC50 = Inhibitory Concentration fifty
IL50 = Inhibitory Level fifty
IMDG = International Maritime Dangerous Goods
INV = Chinese Chemicals Inventory
IP346 = Institute of Petroleum test method N° 346 for the determination of polycyclic aromatics DMSO-extractables
KECI = Korea Existing Chemicals Inventory
LC50 = Lethal Concentration fifty
LD50 = Lethal Dose fifty per cent.
LL/EL/IL = Lethal Loading/Effective Loading/Inhibitory loading
LL50 = Lethal Loading fifty
MARPOL = International Convention for the Prevention of Pollution From Ships
NOEC/NOEL = No Observed Effect Concentration / No Observed Effect Level
OE_HPV = Occupational Exposure - High Production Volume
PBT = Persistent, Bioaccumulative and Toxic
PICCS = Philippine Inventory of Chemicals and Chemical Substances
PNEC = Predicted No Effect Concentration
REACH = Registration Evaluation And Authorisation Of Chemicals
RID = Regulations Relating to International Carriage of Dangerous Goods by Rail
SKIN_DES = Skin Designation
STEL = Short term exposure limit
TRA = Targeted Risk Assessment
TSCA = US Toxic Substances Control Act
TWA = Time-Weighted Average
vPvB = very Persistent and very Bioaccumulative

This product is intended for use in closed systems only.
A vertical bar (|) in the left margin indicates an amendment from the previous version.

There has been a significant change in the required exposure controls/personal protection requirements in section 8.

Revision Date : 08/05/2021

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

US / EN

SAFETY DATA SHEET

Castrol Multipurpose Grease

Section 1. Chemical product and company identification

GHS product identifier Castrol Multipurpose Grease

Product code 467223-TR01

SDS no. 467223

Relevant identified uses of the substance or mixture and uses advised against

Product use Grease for industrial applications
For specific application advice see appropriate Technical Data Sheet or consult our company representative.

Supplier BP Petrolleri A.Ş.
Değirmen Yolu Cad. No:28 Kat: 3 Asya Ofis Park
34752 İçerenköy / Ataşehir, İstanbul
TURKEY

EMERGENCY TELEPHONE NUMBER CASTROL DIRECT 0212 473 77 37
Carechem: +44 (0) 1235 239 670 (24/7)
Ministry of Health National Poison Information Centre: 114 (24 hours)

Section 2. Hazards identification

Classification of the substance or mixture Not classified.

GHS label elements

Signal word No signal word.

Hazard statements No known significant effects or critical hazards.

Precautionary statements

Prevention Not applicable.

Response Not applicable.

Storage Not applicable.

Disposal Not applicable.

Other hazards which do not result in classification Defatting to the skin.
Note: High Pressure Applications
Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency.
See 'Notes to physician' under First-Aid Measures, Section 4 of this Safety Data Sheet.

Section 3. Composition/information on ingredients

Substance/mixture Mixture

Highly refined base oil (IP 346 DMSO extract < 3%). Proprietary performance additives. Thickening agent.

Ingredient name	%	CAS number
n-phenyl-1-naphthylamine	<1	90-30-2
Hydroxyalkyl carboxylic acid	≤0.3	Confidential.

Section 3. Composition/information on ingredients

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Inhalation — If inhaled, remove to fresh air. Get medical attention if symptoms occur.

Ingestion — Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Skin contact — Wash skin thoroughly with soap and water or use recognised skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.

Eye contact — In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.

Most important symptoms/effects, acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Indication of immediate medical attention and special treatment needed, if necessary

Specific treatments — No specific treatment.

Notes to physician — Treatment should in general be symptomatic and directed to relieving any effects.
Note: High Pressure Applications
Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discoloured and extremely painful with extensive subcutaneous necrosis.
Surgical exploration should be undertaken without delay. Thorough and extensive debridement of the wound and underlying tissue is necessary to minimise tissue loss and prevent or limit permanent damage. Note that high pressure may force the product considerable distances along tissue planes.

Protection of first-aiders — No action shall be taken involving any personal risk or without suitable training.

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media — In case of fire, use water fog, alcohol resistant foam, dry chemical or carbon dioxide extinguisher or spray.

Unsuitable extinguishing media — Do not use water jet.

Specific hazards arising from the chemical — In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products — Combustion products may include the following:
metal oxide/oxides
carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)

Special protective actions for fire-fighters — Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters — Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling.

For emergency responders

If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and material for containment and cleaning up

Small spill

Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill

Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. If emergency personnel are unavailable, contain spilt material. Suction or scoop the spill into appropriate disposal or recycling vessels, then cover spill area with oil absorbent. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures

Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

Not suitable

Prolonged exposure to elevated temperature

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

Section 8. Exposure controls/personal protection

Appropriate engineering controls

Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Safety glasses with side shields.

Skin protection

Hand protection

Wear protective gloves if prolonged or repeated contact is likely. Wear chemical resistant gloves. Recommended: Nitrile gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Body protection

Use of protective clothing is good industrial practice.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.
The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Section 9. Physical and chemical properties

Appearance

Physical state	Grease
Colour	Amber. [Light]
Odour	Not available.
Odour threshold	Not available.
pH	Not available.
Melting point	Not available.
Boiling point	Not available.
Flash point	Closed cup: 228°C (442.4°F) [Pensky-Martens.]
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable. Based on - Physical state
Lower and upper explosive (flammable) limits	Not available.
Vapour pressure	Not available.
Vapour density	Not available.
Relative density	Not available.
Density	1000 kg/m³ (1 g/cm³) at 15°C
Solubility	insoluble in water.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.

Section 10. Stability and reactivity

Reactivity	No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerisation will not occur.
Conditions to avoid	Avoid all possible sources of ignition (spark or flame).
Incompatible materials	Reactive or incompatible with the following materials: oxidising materials.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
n-phenyl-1-naphthylamine	Category 2	Not determined	Not determined

Section 11. Toxicological information

Information on likely routes of exposure Routes of entry anticipated: Dermal, Inhalation.

Potential acute health effects

Eye contact No known significant effects or critical hazards.

Inhalation Vapour inhalation under ambient conditions is not normally a problem due to low vapour pressure.

Skin contact Defatting to the skin. May cause skin dryness and irritation.

Ingestion No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact No specific data.

Inhalation No specific data.

Skin contact Adverse symptoms may include the following:
irritation
dryness
cracking

Ingestion No specific data.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Eye contact Potential risk of transient stinging or redness if accidental eye contact occurs.

Inhalation Inhalation of oil mist or vapours at elevated temperatures may cause respiratory irritation.

Skin contact Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

Ingestion Ingestion of large quantities may cause nausea and diarrhoea.

Potential chronic health effects

General No known significant effects or critical hazards.

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Teratogenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

Section 12. Ecological information

Environmental effects No known significant effects or critical hazards.

Persistence and degradability

Expected to be biodegradable.

Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

Mobility in soil

Mobility Spillages are unlikely to penetrate the soil.

Other ecological information This product is unlikely to disperse in water.

Section 12. Ecological information

Section 13. Disposal considerations

Disposal methods

The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	IMDG	IATA
UN number	Not regulated.	Not regulated.
UN proper shipping name	-	-
Transport hazard class(es)	-	-
Packing group	-	-
Environmental hazards	No.	No.
Additional information	-	-

Special precautions for user Not available.

Section 15. Regulatory information

Regulation according to other foreign laws

REACH Status For the REACH status of this product please consult your company contact, as identified in Section 1.

United States inventory (TSCA 8b) Not determined.

Australia inventory (AICS) All components are listed or exempted.

Canada inventory At least one component is not listed in DSL but all such components are listed in NDSL.

China inventory (IECSC) All components are listed or exempted.

Japan inventory (ENCS) Not determined.

Korea inventory (KECI) All components are listed or exempted.

Philippines inventory (PICCS) Not determined.

Taiwan Chemical Substances Inventory (TCSI) All components are listed or exempted.

Section 15. Regulatory information

Section 16. Other information

History

Date of printing	10/23/2020
Date of issue/Date of revision	10/23/2020
Date of previous issue	No previous validation
Version	1
Prepared by	Product Stewardship
Key to abbreviations	ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation [Regulation (EC) No. 1907/2006] UN = United Nations Varies = may contain one or more of the following 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5, 64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-57-0, 64742-58-1, 64742-62-7, 64742-63-8, 64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0, 72623-87-1
References	Not available.

Indicates information that has changed from previously issued version.

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.

SAFETY DATA SHEET

Propane

Section 1. Identification

GHS product identifier : Propane

Chemical name : propane

Other means of identification : Propyl hydride; n-Propane; Dimethyl methane; Bottled gas; propane in gaseous state; propane liquefied, n-Propane; Dimethylmethane; Freon 290; Liquefied petroleum gas; Lpg; Propyl hydride; R 290; C3H8; UN 1075; UN 1978; A-108; Hydrocarbon propellant.

Product type : Liquefied gas

Product use : Synthetic/Analytical chemistry.

Synonym : Propyl hydride; n-Propane; Dimethyl methane; Bottled gas; propane in gaseous state; propane liquefied, n-Propane; Dimethylmethane; Freon 290; Liquefied petroleum gas; Lpg; Propyl hydride; R 290; C3H8; UN 1075; UN 1978; A-108; Hydrocarbon propellant.

SDS # : 001045

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

24-hour telephone : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : FLAMMABLE GASES - Category 1
GASES UNDER PRESSURE - Liquefied gas

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Extremely flammable gas.
Contains gas under pressure; may explode if heated.
May cause frostbite.
May displace oxygen and cause rapid suffocation.
May form explosive mixtures with air.

Precautionary statements

General : Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position. Approach suspected leak area with caution.

Prevention : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Response : Leaking gas fire: Do not extinguish, unless leak can be stopped safely. In case of leakage, eliminate all ignition sources.

Storage : Protect from sunlight. Store in a well-ventilated place.

Section 2. Hazards identification

Disposal : Not applicable.

Hazards not otherwise classified : Liquid can cause burns similar to frostbite.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : propane

Other means of identification : Propyl hydride; n-Propane; Dimethyl methane; Bottled gas; propane in gaseous state; propane liquefied, n-Propane; Dimethylmethane; Freon 290; Liquefied petroleum gas; Lpg; Propyl hydride; R 290; C3H8; UN 1075; UN 1978; A-108; Hydrocarbon propellant.

Product code : 001045

CAS number/other identifiers

CAS number : 74-98-6

Ingredient name	%	CAS number
Propane	100	74-98-6

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Get medical attention if symptoms occur. In case of contact with liquid, warm frozen tissues slowly with lukewarm water and get medical attention. Do not rub affected area. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if adverse health effects persist or are severe. Ingestion of liquid can cause burns similar to frostbite. If frostbite occurs, get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. As this product rapidly becomes a gas when released, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Liquid can cause burns similar to frostbite.

Inhalation : No known significant effects or critical hazards.

Skin contact : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.

Section 4. First aid measures

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : Ingestion of liquid can cause burns similar to frostbite.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:, frostbite

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:, frostbite

Ingestion : Adverse symptoms may include the following:, frostbite

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Gas may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back, causing fire or explosion.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

Section 6. Accidental release measures

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Do not get in eyes or on skin or clothing. Avoid breathing gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F). Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Propane	**NIOSH REL (United States, 10/2016).** TWA: 1800 mg/m³ 10 hours. TWA: 1000 ppm 10 hours. **OSHA PEL (United States, 5/2018).** TWA: 1800 mg/m³ 8 hours. TWA: 1000 ppm 8 hours. **OSHA PEL 1989 (United States, 3/1989).** TWA: 1800 mg/m³ 8 hours. TWA: 1000 ppm 8 hours. **ACGIH TLV (United States, 3/2019). Oxygen Depletion [Asphyxiant]. Explosive potential.**

Section 8. Exposure controls/personal protection

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. If contact with the liquid is possible, insulated gloves suitable for low temperatures should be worn. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Thermal hazards : If there is a risk of contact with the liquid, all protective equipment worn should be suitable for use with extremely low temperature materials.

Section 9. Physical and chemical properties

Appearance

Physical state : Gas.

Color : Colorless.

Odor : Odorless.BUT MAY HAVE SKUNK ODOR ADDED.

Odor threshold : Not available.

pH : Not available.

Melting point : -187.6°C (-305.7°F)

Boiling point : -42.1°C (-43.8°F)

Section 9. Physical and chemical properties

Critical temperature : 96.55°C (205.8°F)

Flash point : Closed cup: -104°C (-155.2°F)
Open cup: -104°C (-155.2°F)

Evaporation rate : Not available.

Flammability (solid, gas) : Extremely flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and oxidizing materials.

Lower and upper explosive (flammable) limits : Lower: 1.8%
Upper: 8.4%

Vapor pressure : 109 (psig)

Vapor density : 1.6 (Air = 1)

Specific Volume (ft ^{3}/lb) : 8.6206

Gas Density (lb/ft ^{3}) : 0.116 (25°C / 77 to °F)

Relative density : Not applicable.

Solubility : Not available.

Solubility in water : 0.0244 g/l

Partition coefficient: n-octanol/water : 1.09

Auto-ignition temperature : 287°C (548.6°F)

Decomposition temperature : Not available.

Viscosity : Not applicable.

Flow time (ISO 2431) : Not available.

Molecular weight : 44.11 g/mole

Aerosol product

Heat of combustion : -46012932 J/kg

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow gas to accumulate in low or confined areas.

Incompatible materials : Oxidizers

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Liquid can cause burns similar to frostbite.

Inhalation : No known significant effects or critical hazards.

Skin contact : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.

Ingestion : Ingestion of liquid can cause burns similar to frostbite.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:, frostbite

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:, frostbite

Ingestion : Adverse symptoms may include the following:, frostbite

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Section 11. Toxicological information

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Propane	1.09	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1978	UN1978	UN1978	UN1978	UN1978
UN proper shipping name	PROPANE SEE ALSO PETROLEUM GASES, LIQUEFIED	PROPANE	PROPANE SEE ALSO PETROLEUM GASES, LIQUEFIED (propane)	PROPANE	PROPANE
Transport hazard class(es)	2.1 	2.1 	2.1 	2.1 	2.1 
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Additional information

DOT Classification : **Limited quantity**
Yes.

Packaging instruction
Passenger aircraft
Quantity limitation: Forbidden.

Cargo aircraft
Quantity limitation: 150 kg

Special provisions
19, T50

For domestic transportation only, UN1075 may be substituted for the UN number shown as long as the substitution is consistent on package markings, shipping papers, and emergency response information. See 49 CFR 172.102 Special Provision 19.
Containers of NON-ODORIZED liquefied petroleum gas must be marked either NON-ODORIZED or NOT ODORIZED as of September 30, 2006. [49 CFR 172.301(f), 326(d), 330(c) and 338(e)]

TDG Classification : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2).
Explosive Limit and Limited Quantity Index 0.125
ERAP Index 3000
Passenger Carrying Vessel Index 65
Passenger Carrying Road or Rail Index Forbidden
Special provisions 29, 42

IATA : **Quantity limitation** Passenger and Cargo Aircraft: Forbidden. Cargo Aircraft Only: 150 kg.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Section 14. Transport information

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined

Clean Air Act (CAA) 112 regulated flammable substances: propane

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Refer to Section 2: Hazards Identification of this SDS for classification of substance.

State regulations

Massachusetts : This material is listed.

New York : This material is not listed.

New Jersey : This material is listed.

Pennsylvania : This material is listed.

California Prop. 65

This product does not require a Safe Harbor warning under California Prop. 65.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : This material is listed or exempted.

Canada : This material is listed or exempted.

China : This material is listed or exempted.

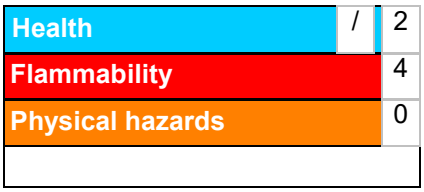
Europe : This material is listed or exempted.

Section 15. Regulatory information

Japan	:	**Japan inventory (ENCS)**: This material is listed or exempted. **Japan inventory (ISHL)**: This material is listed or exempted.
New Zealand	:	This material is listed or exempted.
Philippines	:	This material is listed or exempted.
Republic of Korea	:	This material is listed or exempted.
Taiwan	:	This material is listed or exempted.
Thailand	:	Not determined.
Turkey	:	This material is listed or exempted.
United States	:	This material is active or exempted.
Viet Nam	:	This material is listed or exempted.

Section 16. Other information

Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
FLAMMABLE GASES - Category 1 GASES UNDER PRESSURE - Liquefied gas	Expert judgment Expert judgment

History

Date of printing	:	11/15/2020
Date of issue/Date of revision	:	11/15/2020
Date of previous issue	:	10/5/2020
Version	:	1.02

Section 16. Other information

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

Other special considerations : The information below is given to call attention to the issue of “Naturally occurring radioactive materials”. Although Radon-222 levels in the product represented by this MSDS do not present any direct Radon exposure hazard, customers should be aware of the potential for Radon daughter build up within their processing systems, whatever the source of their product streams. Radon-222 is a naturally occurring radioactive gas which can be a contaminant in natural gas. During subsequent processing , Radon tends to be concentrated in Liquefied Petroleum Gas streams and in product streams having a similar boiling point range. Industry experience has shown that this product may contain small amounts of Radon-222 and its radioactive decay products, called Radon “daughters”. The actual concentration of Radon-222 and radioactive daughters in the delivered product is dependent on the geographical source of the natural gas and storage time prior to delivery. Process equipment (i.e. lines, filters, pumps and reaction units) may accumulate significant levels of radioactive daughters and show a gamma radiation reading during operation. A potential external radiation hazard exists at or near any pipe valve or vessel containing a Radon enriched stream, or containing internal deposits of radioactive material due to the transmission of gamma radiation through its wall. Field studies reported in the literature have not shown any conditions that subject workers to cumulative exposures in excess of general population limits. Equipment emitting gamma radiation should be presumed to be internally contaminated with alpha emitting decay products which may be a hazard if inhaled or ingested. Protective equipment such as coveralls, gloves, and respirator (NIOSH/MHSA approved for high efficiency particulates and radionuclides, or supplied air) should be worn by personnel entering a vessel or working on contaminated process equipment to prevent skin contamination, ingestion, or inhalation of any residues containing alpha radiation. Airborne contamination may be minimized by handling scale and/or contaminated materials in a wet state.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

wsp.com

REPORT

Waste Management Plan

2023 Environmental Site Assessment - West Channel and Camp Farewell

Submitted to:

Shell Canada Limited

400 - 4th Avenue SW, P.O. Box 100, Station M
Calgary, Alberta T2P 4C3

Submitted by:

WSP Canada Inc.
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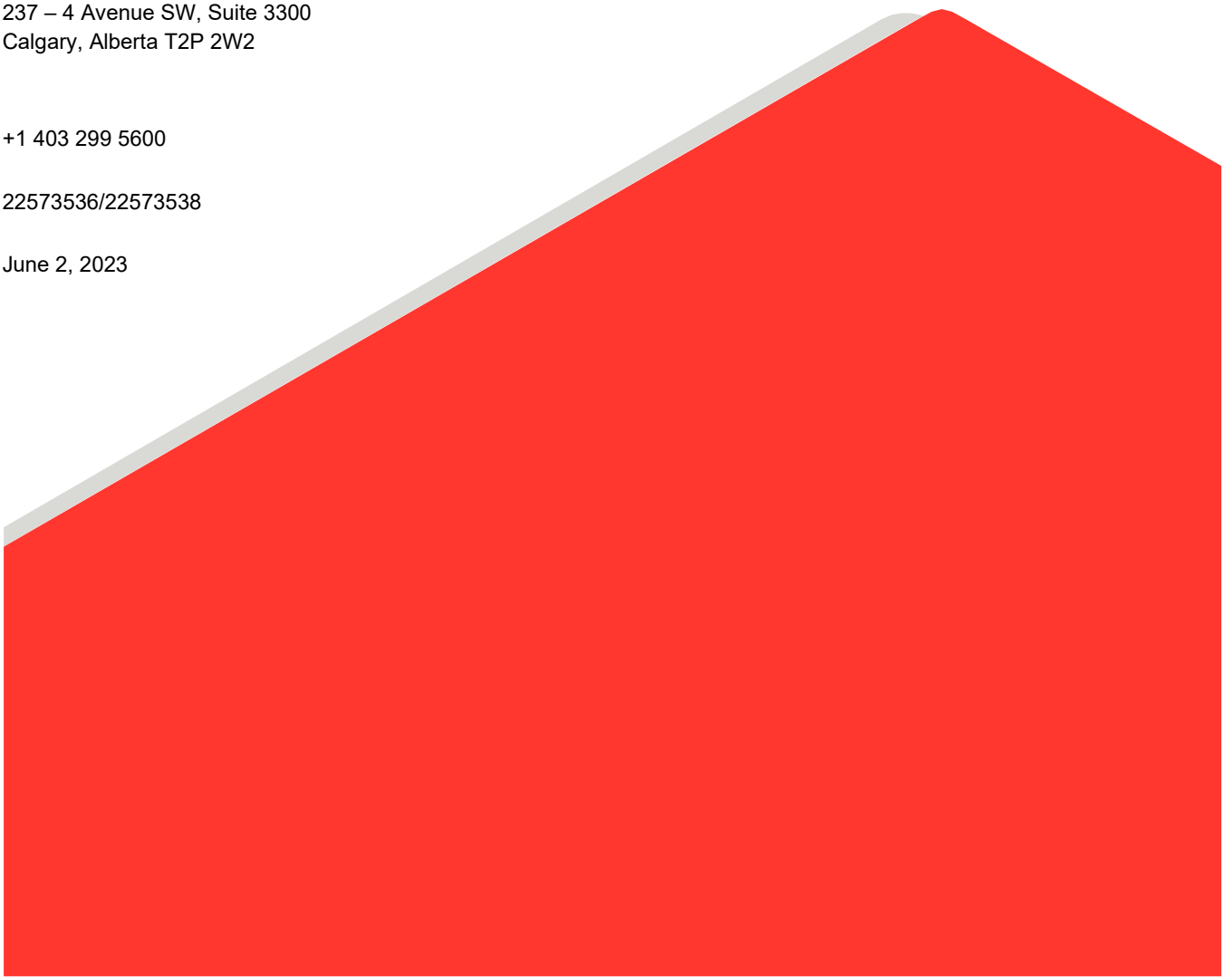
22573536/22573538

June 2, 2023



Distribution List

1 Electronic Copy: Shell Canada Limited

1 Electronic Copy: WSP Canada Inc.

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APPENDICES

APPENDIX A
Town of Inuvik Waste Acceptance Letter

APPENDIX B
Waste Tracking Form

1.0 NAME AND CONTACT OF THE LICENSEE

Licensee:

Shell Canada Limited
400 4th Ave SW, P.O. Box 100 Station M,
Calgary, Alberta T2P 2H5

Key Contact:

Kyle Thompson
Senior Program Manager
Telephone: 403-691-3174
Email: kyle.thompson@shell.com

2.0 GEOGRAPHIC OUTLINE OF THE AREA COVERED BY THE WMP

West Channel, a former staging and storage location to support Shell's local seismic exploration activities, is approximately 37 kilometres (km) northwest of Aklavik on Inuvialuit private land in the Mackenzie Delta. Camp Farewell, a former staging and storage location to support Shell's Mackenzie Delta drilling program, is approximately 150 km northwest of Inuvik, Northwest Territories (NWT) in the Inuvialuit Settlement Region (ISR) on Crown land within the Kendall Migratory Bird Sanctuary. The proposed Site setups are provided in Figures 1 and 2.

The work being completed at West Channel does not require a Water Licence as there will be no direct use of water or disposal of waste at this Site.

3.0 DESCRIPTION OF THE OPERATION AND FACILITIES COVERED BY THE WASTE MANAGEMENT PLAN

3.1 Introduction and Project Details

WSP Canada Inc. (WSP) is the Principal Contractor to Shell Canada Limited (Shell) to complete environmental site assessments (ESAs; the Project) at the Former West Channel and Camp Farewell staging sites (the Sites) in the Mackenzie Delta region of the Northwest Territories (NWT). This Waste Management Plan (WMP) has been prepared by WSP for the Project and describes WSP's approach for waste management. Camp Farewell is operating under Inuvialuit Water Board (IWB) Water Licence NL71-1834 which requires a plan to address waste generated by the barge during the project activities, as per Part D, Item 16 of the licence.

The duration of the 2023 West Channel and Camp Farewell environmental site assessment programs is approximately 65 days. On-site personnel will be accommodated in a barge camp that will be anchored at the West Channel and Camp Farewell sites for the duration of the activities. It is anticipated that approximately 15 personnel will be stationed on the barge at any given time. The barge camp being utilized for the Project can accommodate up to 80 people and consists of living quarters with kitchen, dining room, washrooms, laundry and recreational rooms.

The barge camp will be anchored to an existing bollard as well as to two deadman anchors at the barge landing area.

3.2 Objectives

The objective of the WMP is to be in compliance with Parts D and F of IWB Licence NL71-1834, and it will apply to personnel involved in the generation, treatment, handling, transport and disposal of waste materials for the 2023 Camp Farewell project. The WMP for work being completed at West Channel will be consistent with the proposed plan for Camp Farewell, as described in this WMP.

This WMP characterizes the waste present on-site and the most effective ways to dispose of the waste generated during the 2023 summer program. On-site personnel will be accommodated in a barge camp that will be anchored at the West Channel and Camp Farewell sites for the duration of the work.

4.0 DESCRIPTION OF TREATMENT AND DISPOSAL TECHNOLOGY AND FACILITIES

No waste generated by barge camp operations, drilling or groundwater sampling activities will be treated or disposed of at the Site. Waste generated will be removed for off-site disposal as described in following sections.

At Camp Farewell, the former sewage lagoon was excavated and backfilled in 2013. Other Site infrastructure was decommissioned between 2014 and 2019, except for an emergency shelter, which has been left for use by the local community.

5.0 TYPES AND ESTIMATED QUANTITY OF WASTES TO BE GENERATED OR MANAGED

5.1 Waste Definitions

WSP and its contractors are responsible for ensuring that all existing and generated wastes are properly identified, characterized, and classified as hazardous or non-hazardous and to develop safe and efficient handling strategies that assure regulatory compliance. The WMP will be distributed to all personnel and regular tailgate meetings will stress the importance of Shell's waste management principles and the duties associated with waste segregation.

The following sections provide definitions on the different types of waste, and estimated quantity, that may be encountered while carrying out the Project. Waste is defined as a product or substance that is no longer of any use to the Project and is intended for disposal.

5.1.1 Solid Waste

Solid waste generated from the operation of the barge camp during the Project is expected to include kitchen waste and general refuse (domestic waste). Domestic waste will be stored in garbage bins on the barge, which, once full, will be transferred to a metal container unit on the barge. This unit will be secured to prevent odours from attracting wildlife. Based on previous field programs at the Site, it is estimated that the daily volume of domestic waste generated by the barge camp will be approximately 1 cubic metres per day (m^3/day). During the Project, when the metal container unit becomes full, garbage will be removed and transported by boat to Inuvik where it will be disposed of at the Inuvik landfill.

5.1.2 Wastewater

Wastewater generated from the operation of the barge camp is expected to include grey water and sewage from the camp kitchen, laundry room and washrooms. Grey water and sewage will be stored in three combined grey and black (sewage) 4,000-litre (L) holding tanks on the barge. There is also a spacer barge with one 45,000-L

tank for storage capacity, if required. Based on previous field programs at the Site, it is estimated that the daily volume of wastewater generated by the barge camp will be approximately 4 m^3/day. Upon completion of the Project, wastewater will be transported to Inuvik and disposed of at the Town of Inuvik sewage lagoon.

Purge water removed from groundwater monitoring wells during sampling will temporarily be stored in resealable waste drums on-site until the end of the program, then it will be removed for off-site disposal at the Town of Inuvik disposal facility.

5.1.3 Hazardous Waste

Hazardous waste generated from drilling activities such as waste oil, oil and fuel filters are expected throughout the Project. All hazardous waste will be properly packed in approved transport containers and shipped to a licensed disposal site. E. Gruben's Transport Ltd. (EGT) will be responsible for the disposal of any hazardous waste generated during the Project.

5.1.4 Anticipated Waste

During the 2023 Project duration, the following waste is anticipated to be generated during the Project:

- domestic non-hazardous waste (paper, food, tin cans, plastic packaging, metal and non-recyclable glass jars);
- commercial non-hazardous waste (plastic packaging, flagging tape, stakes and similar items);
- grey water, purge water and sewage waste;
- recyclable beverage containers; and
- grease, used oil, filters, rags, used spill containment kits and other equipment fluids.

6.0 ACTIONS TO BE TAKEN TO REDUCE, COLLECT, STORE, TREAT, REUSE, RECYCLE AND DISPOSE OF WASTES

This WMP incorporates the basic principles of waste management, which include source reduction, reuse, recycling/recovery, treatment, and disposal. The Project is committed to conducting operations within the accepted environmental standards of the construction industry and IWB Licence NL71-1834. Management of waste is an important consideration of Shell's operations. Where possible, every effort is made to minimize waste production by incorporating the principles of waste: Reduction, Reuse, Recycle and Recover.

- Source reduction includes the elimination or reduction of the volume or toxicity of waste by adopting practical methods such as using alternative materials or processes. This principle can be achieved by material elimination, inventory control and management, material substitution, process modification and improved housekeeping, maintenance, and training.
- Reuse is achieved by using a product more than once for the same application or different purposes. Reusing materials such as certain food and beverage containers, pallets, etc., can reduce the amount of waste generated.
- Recycling/recovery of products that typically have one use is an excellent method of reducing the volume of waste generated at a worksite, sorting products so they can be managed in bulk eliminates the need for additional handling and allows for different products to be managed by efficient recycling processes.

- Disposal of waste is considered the final option for waste management. When disposing of waste, the type of waste, volume, location and final containment must be considered. The waste disposal options available to this Project include licensed off-site solid waste sites and municipal sewage lagoons.

7.0 TREATMENT, EFFLUENT AND WASTE QUALITY STANDARDS TO BE ACHIEVED

No waste generated by barge camp operations, drilling or groundwater sampling activities will be treated or released on the barge or the Site.

8.0 FINAL WASTE DISPOSAL OR REUSE METHODS AND LOCATIONS

8.1 Non-Hazardous Commercial and Domestic Waste

Non-hazardous industrial and domestic waste will consist of paper, food, tin cans, plastic packaging, metal and non-recyclable glass jars. Waste will be stored onboard the barge camp and will be periodically transported and disposed of at a licensed landfill facility. Other non-hazardous commercial waste is expected to be composed of plastic packaging, flagging tape, stakes, and similar items. All waste and debris will be collected daily and stored temporarily in wildlife proof containers and regularly transported to an approved landfill (e.g., the Town of Inuvik Solid Waste Disposal Facility). Shell received approval from the Town of Inuvik to accept non-hazardous solid waste (Appendix A). Non-hazardous and domestic waste will be tracked throughout the project on the waste tracking form provided in Appendix B.

8.2 Grey Water and Sewage Waste

Grey water and sewage waste will be stored onboard the barge camp and will be transferred to the Town of Inuvik sewage lagoon at the end of each season or once the Project is completed. Shell received approval from the Town of Inuvik to accept domestic sewage water (Appendix A).

8.3 Recyclables

All personnel will be made aware of the recycling program and notes will be posted in the camp. Recyclable beverage containers will be collected in clearly labelled containers. Recyclables will be collected and transported to the bottle depot in the community of Inuvik.

8.4 Hazardous Waste

The Government of Northwest Territories Environment and Natural Resources, Environmental Protection Section developed a Guideline for the General Management of Hazardous Waste in the NWT, which outlines the registration and tracking of generators, carriers, and receivers of hazardous waste in the NWT. WSP's subcontractor, EGT, will be responsible for any hazardous waste generated during the Project and will provide a copy of the documentation to WSP.

9.0 OPERATOR QUALIFICATIONS AND TRAINING

On-site personnel will receive basic waste management training as part of their orientation. Personnel managing waste will be certified in Workplace Hazardous Material Information System and Transportation of Dangerous Goods.

10.0 REPORTING

An annual report detailing the waste types, volumes and final disposals of the 2023 Project at Camp Farewell will be submitted to the IWB by March 31, 2024, in accordance with Water Licence N7L1-1834. No waste reporting to the IWB is required for West Channel.

FIGURES

Figure 1: West Channel 2023 Proposed Camp Layout

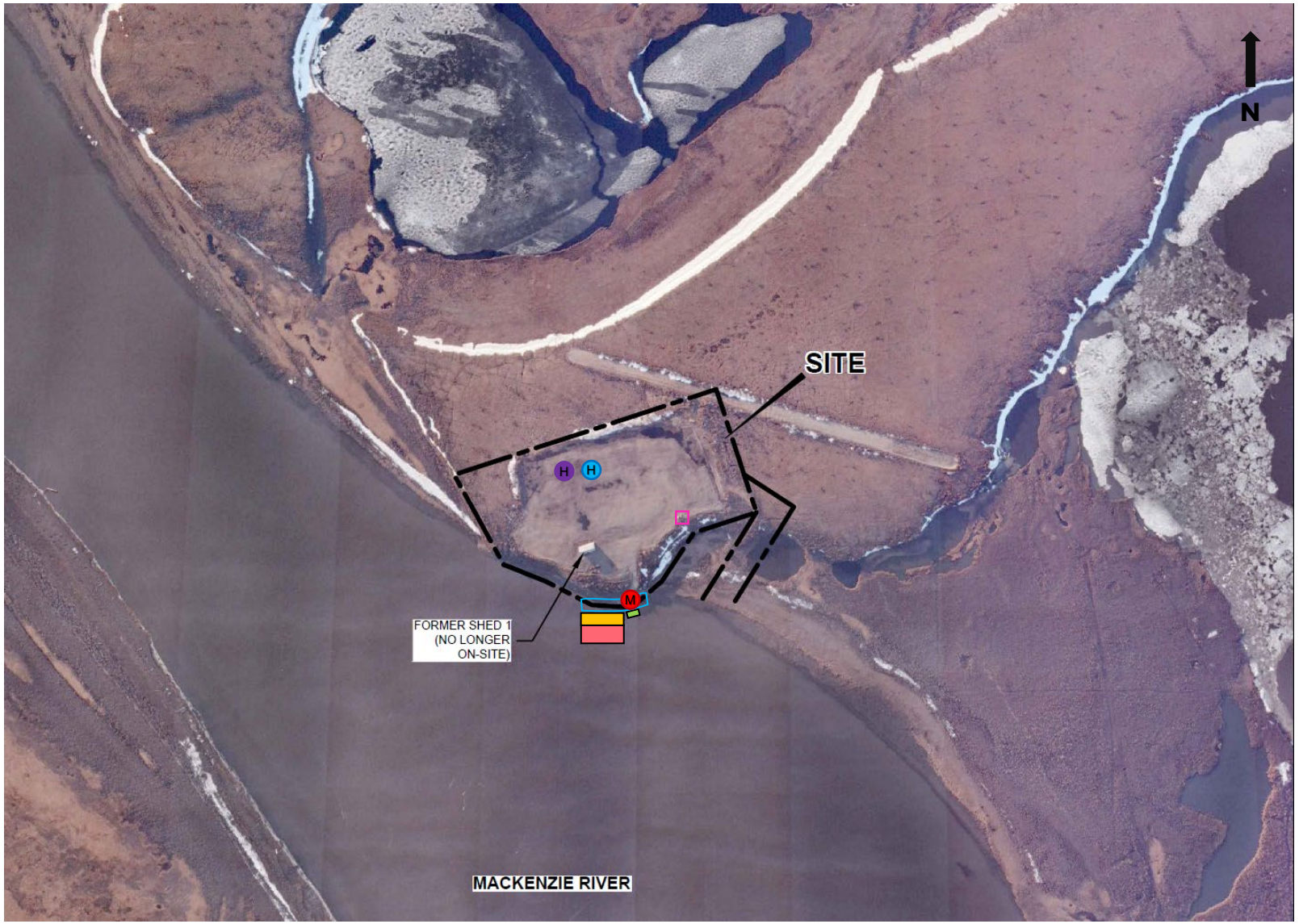
Legend

- Proposed Barge Camp Location - to be confirmed by boat captain in the field
- Proposed Spacer Barge Location - to be confirmed by boat captain in the field
- Proposed Emergency Boat Location - to be confirmed by boat captain in the field
- Proposed After Hour Recreation Area – to be confirmed based on barge location in the field
- M Estimated Muster Point – to be confirmed based on water level and docking location

Figure 2: Camp Farewell 2023 Proposed Camp Layout

Legend

- Barge Camp Location
- Spacer Barge Location
- Emergency Boat Location
- Proposed After Hour Recreation Area
- Emergency Shack
- Estimated Muster Point
- Emergency Helicopter Landing Area
- Helicopter Refueling Area



APPENDIX A

Town of Inuvik Waste Acceptance Letter

TOWN OF INUVIK
2 FIRTH ST, PO BOX 1160
INUVIK NT X0E 0T0

P 867.777.8600
F 867.777.8601
WWW.INUVIK.CA

May 30, 2022

WSP Golder
201 Brownlow Avenue
Suite 26
Dartmouth, NS B3B 1W2

Attention: Ms. Stephanie Villeneuve

Re: Use of Sewage and Solid Waste Dumping Facilities for Camp Farewell Water License (N7L1-1834)

Ms. Villeneuve:

Please be advised that the Town of Inuvik acknowledges that Golder Associates may use the above-mentioned facilities in conjunction with the Camp Farewell Water License (N7L1-1834). As part of this approval Golder Associates or any contractor working on their behalf has acknowledged that there will be a fee for use of these facilities. In addition, they shall inform the Town of Inuvik Director of Public Services when they are to make use of the sewage dumping facility and report the volume of sewage brought in from this project.

The Town will accept in principle the above-mentioned products provided they follow the guidelines and fees as set out in the various Town of Inuvik by-laws. All the waste must be domestic use type only. None of it shall contain any drilling or industrial type waste.

We are required as part of our water license to account for these types of additional wastes entering our sewage lagoon and solid waste site, respectively.

If you have any questions or concerns, please do not hesitate to contact me. Thank-you in advance for your cooperation.

Regards

Town of Inuvik

Grant Hood
Senior Administrative Officer

CC: Rick Campbell – Town of Inuvik – Director of Public Services

APPENDIX B

Waste Tracking Form

WASTE MANIFEST

A. GENERATOR INFORMATION		
Generating Company: Shell Canada Limited c/o WSP Canada Inc.	Waste Generator ID No: n/a	
Generator Contact:	Phone:	Fax: N/A
Generating Site Address:	e-mail:	

B. BILLING INFORMATION		
Billing Company:	Phone:	Fax: N/A
Billing Contact:	e-mail:	
Billing Address:	Invoice Instructions (i.e. project and PO Number):	
Name (print): Virginia Anderson	Signature:	

C. WASTE DESCRIPTION
How was the waste generated (detailed)?
Waste Generation Date:
Waste Volume (m^3):

D. RECEIVER INFORMATION		
Receiving Company:	Phone:	Fax: NA
Receiving Address:	e-mail:	

E. TRANSPORTER INFORMATION		
Company Name:	Unit Number:	
Company Address:	Phone:	Fax:
Name (Print):	Signature:	

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