Government of Northwest Territories
Gouvernement des Territoires du Nord-Ouest

Department of Infrastructure Inuvik Region

SPILL CONTINGENCY PLAN 2022

Inuvik Region
February 2022

Peel River Cable Ferry Crossing, Km 74, Dempster Highway (No 8)
Arctic Red River Ferry Crossing, Km 143.6, Dempster Highway (No 8)

Table of Contents

Section 1.0 Spill Contingency Plan

Summary

The GNWT operates two ferries, Abraham Francis and Louis Cardinal in the Gwich'in Region. Ferry operations provide transport of passenger vehicles and commercial vehicles carrying passengers, goods and services to communities in the Beaufort Sea – Mackenzie Delta area. To operate these ferries it is necessary to construct gravel landing pads to provide level entrances and exits of vehicles travelling on the ferries. In other parts of the Territory, permanent landings are used for the placement of the hydraulic ferry ramp. In the Gwich'in region, ferry landings are subject to fluctuations in water making it necessary to build and rebuild the landings as they are subject to erosion and seasonal ice scouring. To operate and maintain the landings, heavy equipment such as front end loaders and bulldozers must operate close to the water's edge. This presents a small threat to the environment as heavy equipment can be subject to accidental spills as would any other vehicle. The chemistry of these potential spills is almost exclusively hydrocarbon in nature. Though the volume of any given spill is expected to be relatively minimal, the location of the ferry maintenance operations and their close proximity to water make a coordinated response necessary.

Under the NWT Waters Act and Section 6 g (i) and (ii) of the NWT Waters Regulations all operations requesting licences for water use and waste disposal must prepare comprehensive spill contingency plans. The following plan will establish the state of readiness, the lines of communications and the coordinated response in the event of a spill.

1.1 Purpose and Scope

The Inuvik Regional Ferry System in an integral part of the Transportation of goods and services to Northern Communities. The ferries allow for access across the Peel River and Mackenzie Rivers, thereby providing services directly to the communities of Ft. McPherson, Tsiigehtchic, Inuvik and Tuktoyaktuk. The ferries typically run between June 5th and October 25th of any given year, making an estimated 40-60 crossings per day for a total of approximately 37,000 vehicle crossings per ferry crossing season.

As a part of its due diligence, the Department of Infrastructure (INF) has developed a Spill Contingency Plan to specifically address ferry landing spill concerns, anticipate emergencies and implement reasonable plans that would be enacted should a Spill

emergency unfold. The attached Spill Contingency Plan forms the basis of action required by Department of Infrastructure personnel and its contractors to effectively engage a spill source from Km 74, (Abraham Francis; Peel River ferry crossing) and Km 142.6 to Km 143.6, (Louis Cardinal Ferry; Arctic Red-Mackenzie river crossing) of the Dempster Highway (No 8) ferry landings.

It is the duty of the Department of Infrastructure to review The Spill Contingency Plan (SCP) with all workers as part of their orientation before each ferry season begins. Revisions to the SCP will be made as the project requires and the plan will be updated as needed should operations be modified or expanded. The following Spill Contingency Plan forms the immediate plan of action to be initiated when the Department of Infrastructure, GNWT, and their contractors observe a Spill.

1.1.1 Contact Information:

Patrick McLaughlin
The Department of Infrastructure
Inuvik Region
P.O. Box 2038
INUVIK NT, X0E 0T0
Telephone: 867-777-7163
Email Patrick_McLaughlin@gov.nt.ca

1.1.2 Key Contact Information:

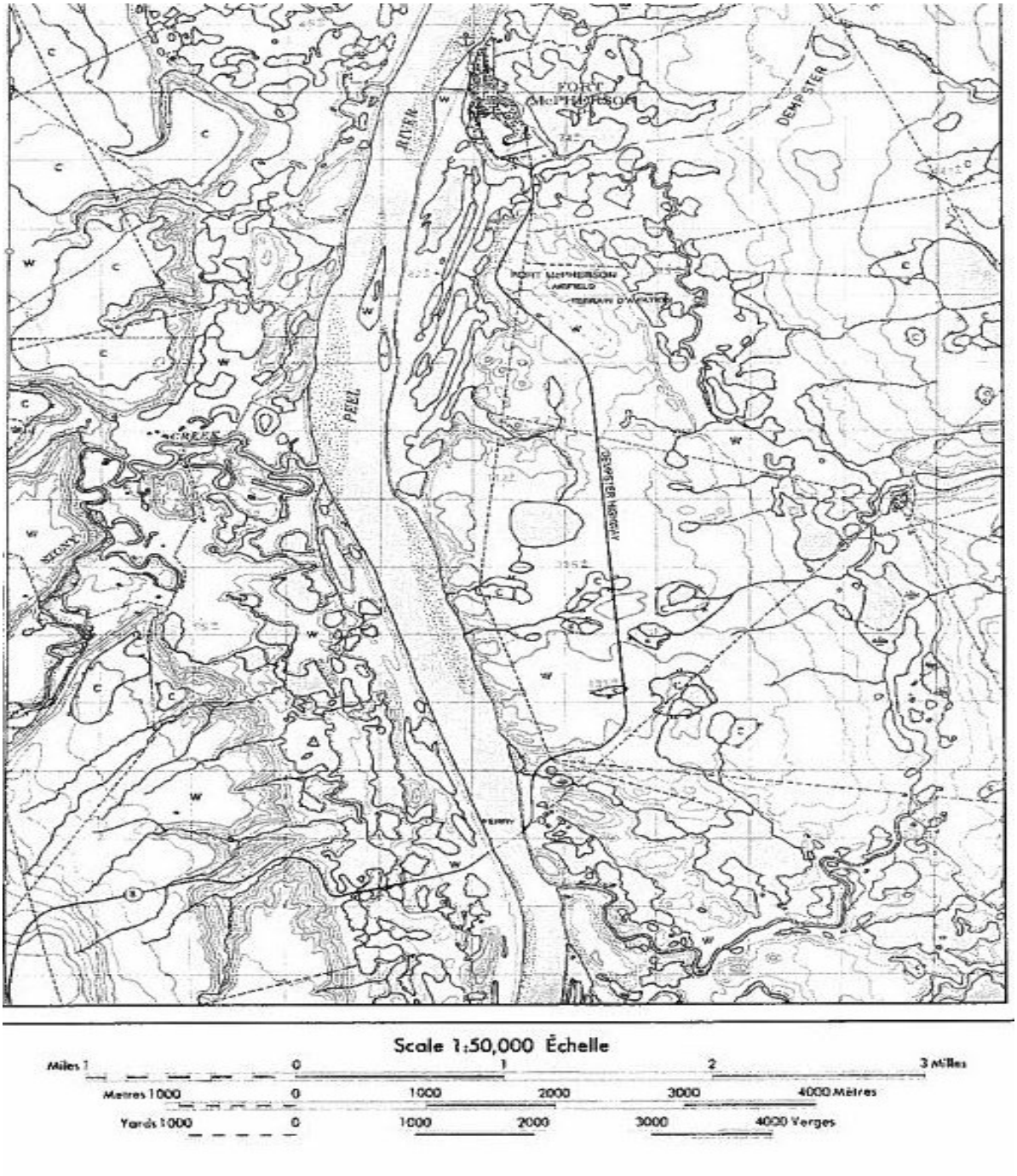
Gwich'in Land and Water Board: 777-4954
Lands Inspector: 777-8906
Water Resource Inspector: 678-6676
RCMP: 777-1111
Fire Department: 777-2222
NWT Spill Line 920-8130

1.1.3 Dates of Operation: May 2022 – November 2032 (to be reviewed annually)

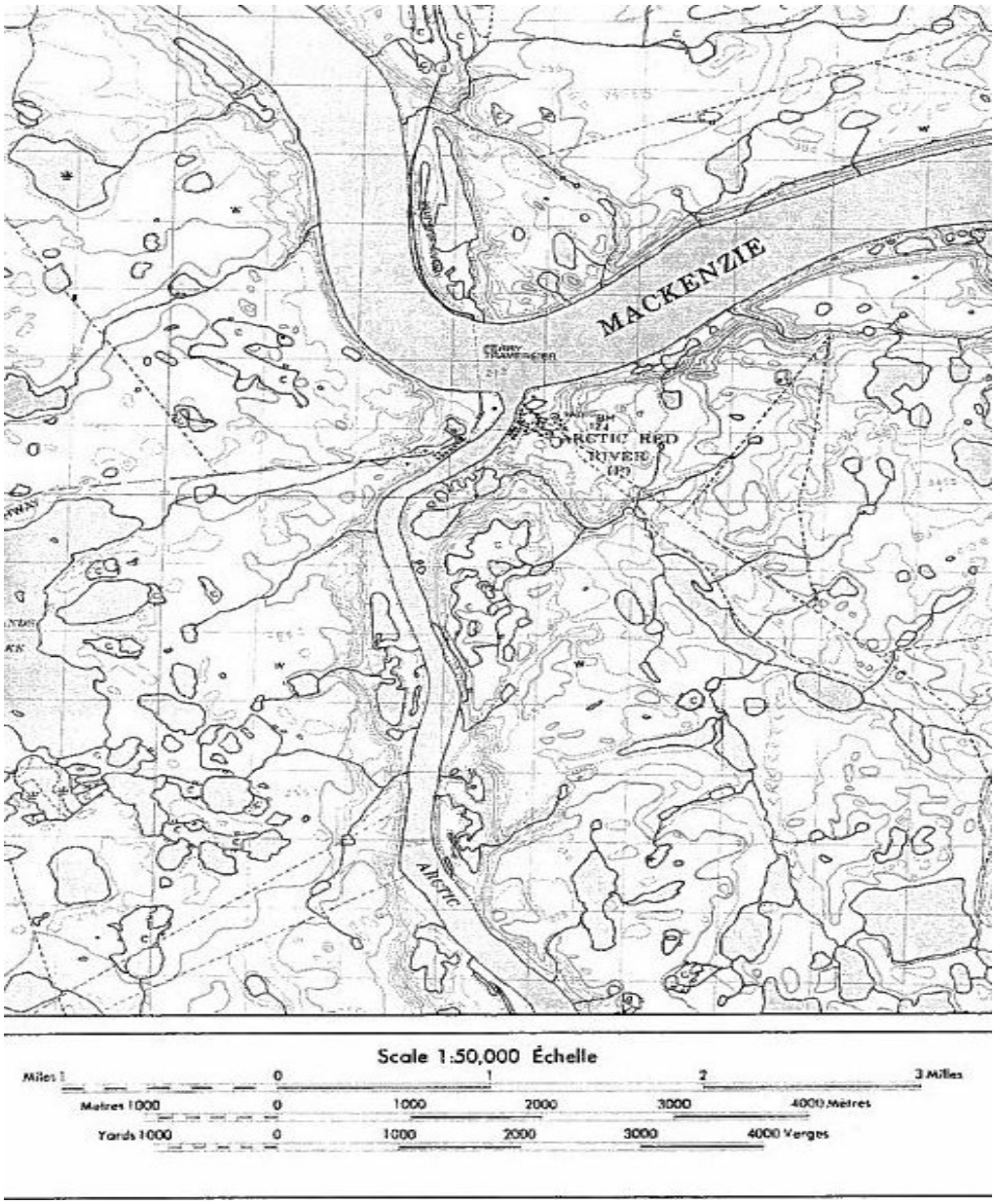
1.1.4 Date of Last Revision: February 2022

1.1.5 Site Locations: Peel and Mackenzie River Ferry Landings

Coordinates for DOT Abraham Francis Cable Ferry at the Peel River Crossing, Km 74 are near 67°26′07″N & 134°52′55″W



Coordinates for DOT Louis Cardinal Ferry at the Arctic Red River Crossing, Km 142.6 to Km 143.6 are near:
67°26′26″N & 133°44′43″W



1.1.6 Types of Contaminants: Petroleum fuels and oil lubricants will be used on the work site.

1.1.7 Storage of Contaminants: Fuel will not be generally stored on-site for equipment.

Section 2 Project Description

2.1 Gwich'in Region Ferry Services

The project is an ongoing duty of the GNWT to supply ferry services to the region and its duty to respond to spills associated with normal operations associated with the Ferry Landings located at the terminus of the Mackenzie River and the Arctic Red river; and Peel River loading areas. Heavy equipment is used to maintain the landing locations, more often than not a front end loader and bulldozer. Gravel is end dumped on the edge of the river and then pushed onto the bank to form a landing for the two Ferries at five landing locations. The nature of any potential spills from this maintenance equipment would be on land and normally of hydrocarbon composition, eg. a leak from an oil pan or crank case as a result of impact damage or wear and tear.

The amount of fuel on each machine varies between 110L for a light duty pickup truck and 300 litres of diesel for a front end loader with a full tank. In other rare circumstances heavy equipment such as a grader or backhoe will be used for ferry landing maintenance, and the fluids associated with these pieces of equipment would also be hydrocarbons (Gasoline, Diesel, Engine Oil or Hydraulic Fluid).

> Because the operations are taking place at the edge of the water and at times with an equipment bucket in the water, the potential for water contamination is direct and therefore INF has the duty to report:
>
> ***"Any amount of fuel and all harmful substances near or in water, regardless of quantity is to be reported to the NWT Spill Line".***

This plan is required for the very specific purpose of operating the Ferry Landings in the Gwich'in Region. Its contents are not transferable to other regions and the plan does not cover other jurisdictional authority such as the spill plan associated with the ferry operations in the water. This plan demonstrates a response to spills *generated on the landings* that have potential to affect the water quality. For information regarding the marine operations spill contingency plan please contact the Department of Infrastructure Marine Services Division.

2.2 The Department of Infrastructure Environmental Commitment

INF has undertaken a number of initiatives to date to improve the Department's environmental performance. Actions are ongoing to improve the energy efficiency of our

facilities and the fuel efficiency of GNWT vehicles and ferries. These efforts have assisted in reducing operating costs, pollution and Greenhouse Gas (GHG) emissions. INF considers traditional knowledge (TK) information collected in transportation planning studies and in the implementation of its programs and projects. INF also conducts internal audits of its facilities to ensure compliance with environmental regulations. The Department is represented on the Environmental Remediation Committee that monitors the assessment and restoration of GNWT contaminated sites. However, recognizing that we can do more, INF is committed to examining how operations associated with developing, operating, and maintaining the territorial transportation system can be improved and made more environmentally sustainable.

2.3 Site Descriptions

2.1.1 Peel River Ferry Landings: The Peel River landings vary in size, between 7 and 8 metres in width (across the face). The length of the landing varies depending on the depth of the water. The landings are located near the Hamlet of Fort McPherson, approximately a 10 minute drive from the Hamlet center. It is rural by description, being too far away to immediately benefit from any Hamlet emergency services. There is however, the Peel River Ferry Camp associated with the ferry landing operation where operational equipment is stored. The Abraham Francis is among the smallest capacity ferries in the North, the vessel is maneuvered back and forth across the Peel River on a cable device, transporting vehicles and goods. There are traditional land users located up and downstream of this location. In the event of a spill the Tetlit Gwich'in Council, the Renewable Resources Council and the Hamlet of Ft. McPherson administrative office will be contacted.

Generally speaking, the topography surrounding the landings is sloped towards theriver however the landings themselves are fairly flat.

2.3.1 The Tsiigehtchic Ferry Landings: The Tsiigehtchic Ferry (Louis Cardinal) lands at three points at the convergence of the Arctic Red River (on the West bank, Dempster South side) the Mackenzie River (East bank, Dempster North side) and the Charter Community of Tsiigehtchic (confluence of both rivers). Generally speaking, the topography of the surrounding area is hilly and sloping towards the river but the landings are fairly flat. This area is subject to frequently changing water conditions and seasonal fluctuations of the water level in both the Arctic Red and Mackenzie Rivers. The width of the three landings varies, but generally the North side and the Tsiigehtchic sides are approximately 9m, while the south landing is approximately 16 metres. There are a couple of cabins along the North side embankments that would be notified immediately after a spill, the Charter

Community of Tsiigehtchic (includes band office) would be contacted and the Gwichya Gwich'in Renewable Resource Council would be notified in the event of a spill event.

TABLE 1: List of Materials stored at each site, type of containment and the normal quantities at each location

Material	Storage Container	Normally on Site	Storage Location
Gasoline Diesel Hydraulic Fluid Engine Oil	None stored within the limitations of this licence.	The storage of the materials noted in this section is not near the ferry landings.	Fuel of this nature is stored at maintenance facilities, away from the ferry landing zones.

2.4 Preventative Measures

Vehicles will be inspected regularly for leaks, loose hoses and damage or corrosion that may lead to gas, diesel or Hydraulic fluid leaks. Vehicles will not be parked within the ordinary high water mark for long periods of time. When it is necessary to park a vehicle on stand-by at the water's edge, oil pan drip trays will be placed under potential leak areas. Refueling of equipment takes place within the Ferry Maintenance Camp, away from the water. Transfer Tanks are not used.

2.4.1 Location of Plan Copies

The plan will be kept on site at the Highway #8 Ferry Camp on the Northeast bank of the Mackenzie River and a copy will be maintained at the Ft. McPherson Highways Maintenance Facility near the Peel River Ferry Landing.

2.4.2 Existing Preventative Measures

All machines and equipment have on board spill kits and absorbent materials. Individual machines working on the landings will have their own shovels and spill kits on the vehicle. Spill Kits, at a minimum, shall include sorbent pads or equivalent, shovels, and a means for containment of contaminated materials (e.g. impermeable tarps, barrels).

Secondary contributions to and on land spill or a spill which transferred from the land to warer, as a result of ferry landing operations and maintenance, would come from the Ferry where booms can be deployed from the ferry to contain and prevent fuel from entering the water from the shore.

Suitable communication equipment and all emergency numbers will be available prior to commencement of all field activities. Maps indicating major roads, access roads, nearby surface water bodies, any hazardous material near the site, slope of the land, nearby communities and other important features; Materials Safety Data Sheets (MSDS)

for each hazardous chemical shall be available on site during field operations.

The primary goal is to avoid spills or the unnecessary release of materials. All personnel shall have an environmental orientation prior to starting work. This will include a review of this Spill Contingency Plan (SCP). In the unlikely event of a spill or release of materials, the objective will be a quick response. The SCP defines the responsibilities of site personnel and the required procedures for a quick response by emphasizing the need to reduce the safety hazards and minimize environmental impacts.

Section 3.0 Response Organization

3.1 Organization Flow Charts

The flowchart (figure 2.1) on the following page depicts the chain of command and reporting in the event a spill is experienced. Section 3.2 below explains the steps involved in notifying the correct person(s).

3.2 Response Actions

The following actions should be taken in the event of a spill:

- Spill identification: Recognizing that a spill has occurred.

- Operators/workers should notify the ferry Captain by radio or by communicating with a deck employee, that a spill has occurred.
    - The ferry captain has access to communication systems that can reach appropriate personnel (as indicated in Figure 2.1), local communities, and emergency services to convey information on the spill and its potential associated hazards.

- **INF Inuvik Region Marine Services Employee or Contractor will contact the NWT Spill line** (**867-920-8130**) *regardless* of the spill size and a report will be filed.
    - It is expected that the NWT Spill Line personnel will contact the GNWT Water Resources Officer however it's in the best interests of the response team to also communicate directly to the GNWT Water Resources Officer, the details of the spill.

- The INF Inuvik Region Marine Manager will maintain a direct line of communication with the Ferry Captain/Duty Manager and the Water Resources Officer in order to relay information and direction.

- The INF Inuvik Region Marine Manager will also be in contact with the INF Inuvik Regional Superintendent who can then notify and/or seek the assistance of the INF Environmental Affairs Analyst.
    - The INF Regional Superintendent and/or the INF Marine Manager can give authority to the INF Environmental Analyst to speak with the Water Inspector directly, and to coordinate the spill clean-up.
    - The Inuvik Region Superintendent will be kept informed of all decisions made and actions deployed.

Figure 2.1 Response Notification Flow Chart

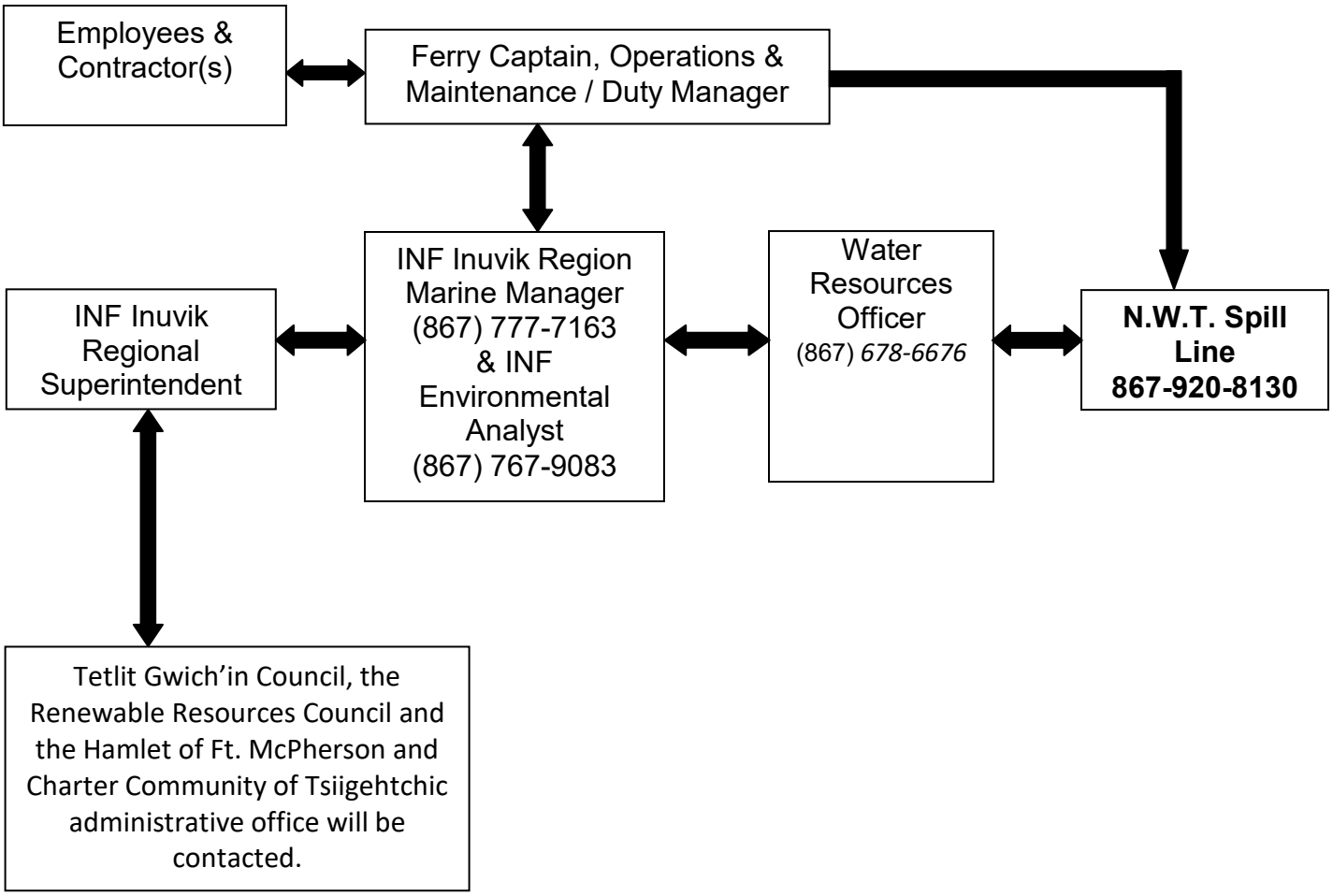
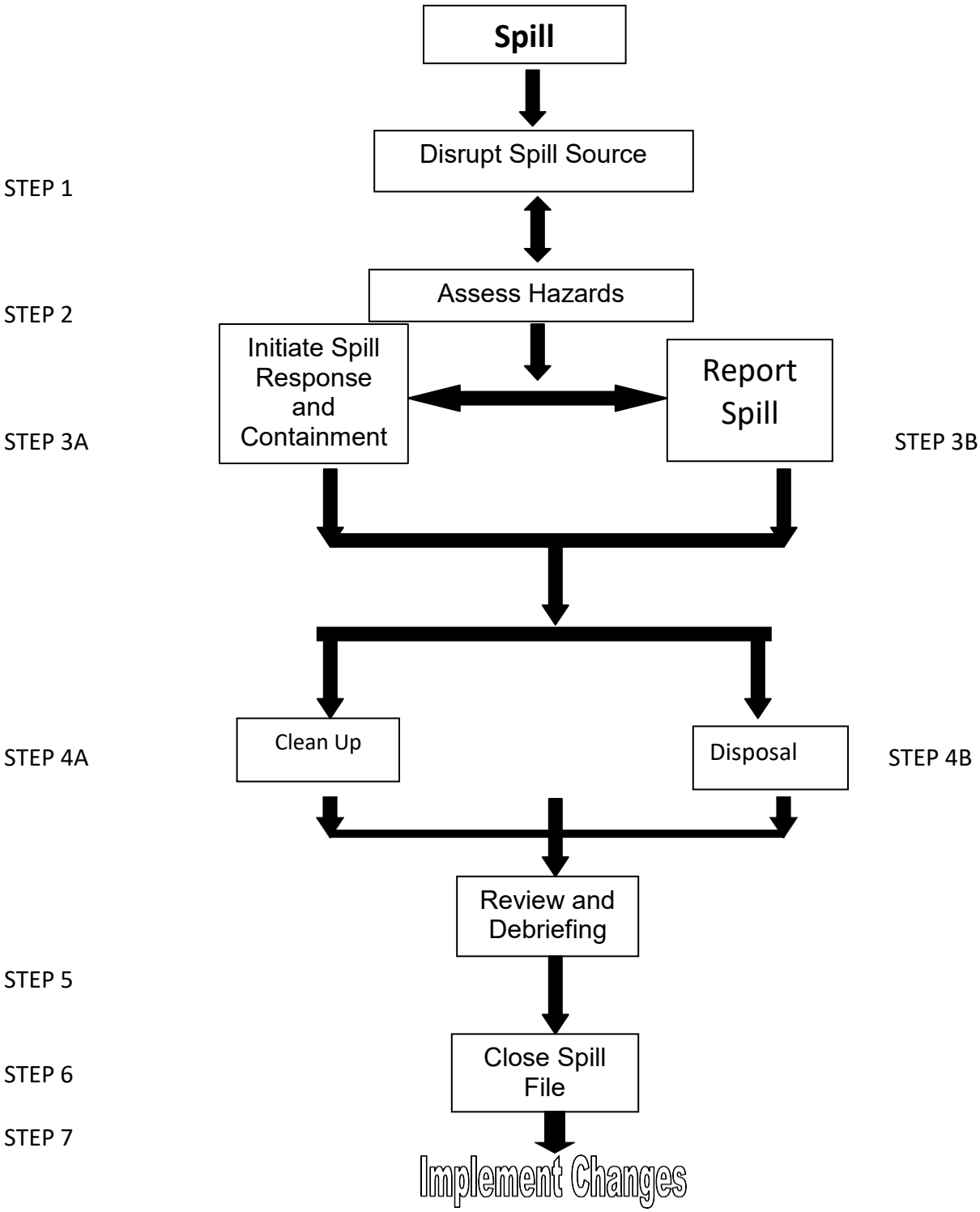


Figure 2.2 SPILL ACTION FLOW CHART



The spill response flowchart above illustrates the steps taken to bring any given spill event to a resolution. Below is a written description of the steps taken during a spill event.

3.3 Step by Step Instructions

STEP 1 - Shut Off Source of Spill (if possible)

- Locate the spill source, and if safe to do so, shut it off.
- If the product is being pumped, shut off the pump.
- Stem the flow of leaking material if it cannot be shut off.

STEP 2 - Assess Hazards

- Alert all persons in the immediate area that a spill has occurred.
- Keep all persons not directly involved with containment procedures away from the spill site.
- Ensure all personnel involved in the containment procedures are aware of the hazards and are issued personal protective equipment.

STEP 3A - Initiate Spill Response and Containment

- Call personnel in the Response Notification Flowchart to enact Spill Response.
- Determine what will be affected by the spill.
- Determine actions to reduce damage and affected areas as a result of the spill.
- Determine the direction the spill is moving and how quickly.
- Determine what is causing the spill to move (wind, gravity, water, etc.).
- Determine where the spill can be contained with available staff and equipment.
- Take all necessary steps to prevent the spill from contaminating any potable water sources or waterways.
- Contain the spill.

STEP 3B – Report Spill

- Fill out and fax the Spill Report (attached) to the NWT Spill Line.

STEP 4A and B - Spill Clean-up and Disposal

- Prior to initiating clean-up and disposal procedures, the procedures must be approved by the Water Resources Officer.

- Discuss cleanup and disposal procedures with the Water Resources Officer, prior to initiating clean-up.

STEP 5 – Internal Debriefing

- Review cause, effects and contingency plan procedures. This review is to be conducted internally.

STEP 6 – Close Spill File

- INF Environment Affairs Division will follow up with ENR to ensure that a satisfactory cleanup and/or remediation of affected areas have been completed and a written confirmation that the spill file is closed has been received.

STEP 7 – Implement Changes

- Develop and implement a Corrective Action Plan (CAP) to reduce probability of future incidents causing spills.
- Revise this document as lessons are learned and new technologies become available.

3.4 SPILL REPORT FILING PROCEDURES

3.4.1 Spill Guide

As established in figure 2.1 the response flow charts follow easy to use visual diagrams so that any marine personal with be able to reasonably action a spill safely and responsibly. The flow chart is supplemented by an attached step by step instruction in plain language to assure the reporter includes the most pertinent information. From there, the available personnel are required to report the spill following a few simple guidelines below

3.4.2 Spill Reporting

The procedures include both multi-agency and internal reporting protocols that will ensure rapid communication of the details to the proper authorities and reduce the duplication of efforts and details that often hamper emergency responses.

1. Fill out “SPILL REPORT” form as completely as possible.

2. Fax or call in the spill report IMMEDIATELY using the 24 hour Spill Report Line:

3. Ensure that the 24 Hour Spill Line provides a "spill number" which will be printed on the top of the completed Spill Report form.

INF (Ferry Captain) shall fax Spill Reports to and/or call:

- 1. N.W.T. 24 Hour Spill Line — 867-920-8130 (Phone) 867-873-6924 (Fax)

- Environmental Analyst : 867-767-9083 (Office Phone)

Following a spill and the immediate actions taken to stop the spill source, contain the spill and assess site safety, the INF Marine Manager will contact the Environmental Analyst and provide information of the status of containment. The INF Regional Superintendent and/or the INF Marine Manager can give authority to the INF Environmental Analyst to speak directly with the Water Resources Officer if they so choose. The Environmental Analyst will notify the Superintendent of the discussion and any methods for dealing with the spill. Cleanup and disposal efforts will commence following communications between the Water Resources Officer and authorized INF personnel. All other updates to the spill's status should be promptly relayed as per the communication response.

Since the spills are in the immediate vicinity of the Peel, Arctic Red and Mackenzie Rivers, all spills will be reported to the NWT 24 Hour Spill Hotline.

When calling the NWT Spills Hotline, the person reporting the spill shall provide the following:

Date and time of spill

- *Direction spill is moving (or if it has stopped)*
- *Name and phone number of persons close to the location of the spill*
- *Type of containment spilled and quantity spilled*
- *Cause of the spill*
- Whether the spill is continuing or has stopped
- Description of the existing containment
- Actions taken to recover, clean-up and dispose of spilled contaminant
- Name, address and phone number of person reporting the spill
- Name of person in charge of management or control at the time of the spill

3.5 Processes for staff response to media and public inquiries

The duty to respond to media and public inquiries will rest with the Superintendent of the Inuvik Region. Information from the Duty Manager will be communicated when opportunities and time permits. No other staff will be required to respond to inquiries or speak with media. The approach will be one window, to avoid any conflicts with information updates and reduce the spreading of rumors.

Section 4.0 Action Plan

4.1 Hazard Assessment

The table below represents a likely spill event, worst case scenario discharge and the potential worst case effect of the discharge. The amounts associated with this operation are small but have the potential to enter directly into the receiving environment (water). MSDS Sheets have been attached to the Spill Contingency Plan.

Table 2. Potential spill sizes and sources for each hazardous material on site

Material	Potential Discharge Event	Discharge Volume (Worst Case)	Direction of Potential Discharge
Gasoline	1. Ruptured or leaky fuel tank 2. Spill from a roll over	• 110L (all service trucks have 110L tanks)	Toward the river(s); Mackenzie or Peel Seeping into riparian zone ground water eventually entering the rivers and moving downstream
Diesel	1. Heavy Equipment Fuel Tank Leak 2. Spill from a roll over	• 300L – Front End Loaders have 300L tank; Caterpillar has 200L tanks and Backhoe 150L	Toward the river(s); Mackenzie or Peel Seeping into riparian zone ground water eventually entering the rivers and moving downstream
Hydraulic Fluid	1. Broken hose; damaged hydraulic joint	• < 100L – likely a minimal amount; greatest risk from front end loader, oily in nature	Toward the river(s); Mackenzie or Peel Seeping into riparian zone ground water eventually entering the rivers and moving downstream

Engine Oil	1. Cracked crank casing or ruptured oil pan. 2. Leaky hoses or reservoirs	• <10 liters – most vehicles will have engines with less than 10L of oil	Toward the river(s); Mackenzie or Peel Seeping into riparian zone ground water eventually entering the rivers and moving downstream

4.2 Potential Environmental Impacts

The overall hazards associated with this type or operations are listed below by substance. The Ferry operations are conducted during open water conditions, spills associated with the operation of the winter road are covered under the INF –Highway 8 Spill Contingency Plan. Where spills are experienced in conditions of open water while there is snow on the ground, please refer to the "spills adjacent to a water body" heading under this section.

4.2.1 Gasoline

Environmental Impacts: Gasoline may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Gasoline is quick to volatize. Run off must be avoided

Worst case scenario: Equipment working would have a fuel tank rupture and a maximum of 100L would flow directly into the river. This would cause illness or death to animals in the immediate area of the spill but would dissipate into the river.

4.2.2 Diesel Fuel

Environmental Impacts: Diesel fuel is toxic to aquatic life at a concentration of 2 liters per million liters of water. The fuel has the potential to bio accumulate and is not readily biodegradable.

Worst Case Scenario: 300L of Diesel fuel would leak from a ruptured tank on a front end loader. A ruptured tank would purge itself immediately, entering into the river system directly.

4.2.3 Engine Oil

Environmental Impacts: Engine Oil is immediately toxic to the aquatic environment. It is harmful to fish and mammals. It is a persistent pollution and does not biodegrade

Worst Case Scenario: The amount of diesel fluid that has the potential to threaten the environment is minimal, however it does have the potential to bio accumulate and is classified as toxic so all amounts will be reported. A worst case scenario would be a cracked and leaking engine block.

4.2.4 Hydraulic Fluid

Environmental Impacts: An oil based lubricant, it is immediately toxic to the aquatic environment. It is harmful to fish and mammals. It is a persistent pollution and does not biodegrade

Worst Case Scenario: The amount of hydraulic fluid that has the potential to threaten the environment is minimal, however it does have the potential to bio accumulate and is classified as toxic so all amounts will be reported. A worst case scenario would be a damaged hydraulic cylinder or cracked reservoir leaking directly into the river (Peel or Mackenzie).

4.3 Procedures for initial actions

No emergency can be addressed without the consideration of the individual responder's protection being given first priority. If responder's are injured or their health compromised the emergency actions deployed cannot be considered a measurable success. Each and every action should take place when and only when safety is the number one priority followed by human health and then environment. All workers are required by the Occupational Health and Safety Act to protect themselves prior to proceeding with any action. **For a general guideline, workers are asked to consider their actions prior to responding to an emergency**:

4.3.1 Safety

- Is it safe to respond to the emergency?
- Are you wearing the proper equipment to respond to the emergency?
- Do the employees around you possess adequate personal protective equipment?
- Have you been adequately trained to respond to the emergency you are faced with?
- Is there a route of escape should the emergency escalate?
- Will the actions you take have the potential to affect the safety of others?

4.3.2 Health

- Are there any potential long or short term health effects associated with materials you will be handling?
- Are you wearing the proper equipment to deal with the spill or emergency (SCBA, Rubber Safety Boots, Rubber clothing)?
- Are you aware of the physical of chemical properties of the materials might come in contact with?
- Is there Material Safety Data Sheet available to review prior to deploying any actions?
- Are there materials that have the potential to from a reaction in close proximity?
- Have you received any formal training to deal with the hazard you face?

4.3.3 Environment

- Do the materials you are handling have the potential to effect the environment?
- If left exposed, will does the spill/emergency have the potential to affect wildlife/fish?
- Will the spill/emergency have a long term impact on the flora and fauna?
- Does the spill/emergency have the potential to affect drinking water?
- Does the spill/emergency have the potential to affect the community quality of life or the aesthetics of the settlement?

Proceed to action based on protection measures available to address emergency response in this order; Safety, Health and Environment.

4.4 Spill Containment Procedures

4.4.1 General Spill Containment Procedures

- Identify the contaminant, stop the source of the spill, and when safe, immediately implement containment measures to limit the spread of the spill and to minimize the impacts to the environment;

- Prompt containment can reduce environmental exposure and risk. Containment measures may be land or water based. Land based measures include application of sorbents, construction of berms and diversion/collection trenches.

- If spill source is a leaking fuel truck, pump tanker dry (into appropriate containers or another tanker);

- A shallow depression shall be excavated or a surface berm constructed in the path of the following product to stop and contain the flow. If feasible, without unduly delaying containment efforts, the surficial stripping shall be salvaged and stored separately during excavations;

- Sorbent materials shall be utilized to contain and recover spilled material;

- Heavily contaminated soil and vegetation, as well as used sorbent material, shall be disposed of at an approved hazardous waste facility;

- Traffic will be minimized on and around contaminated areas;

- Attempts will be made to restrict the movements of wildlife near the area affected by the spill (if applicable), and;

- Remediation and final clean-up will be conducted until the spill and immediate location has been reclaimed to an equivalent capability prior to the incident.

4.4.2 Spills Adjacent to a Water Body

- Berms or trenches shall be constructed to restrain spilled products from entering into a water body;
- Spilled materials shall be recovered as quickly as possible;
- If spilled material enters an open water body, floating booms, skimmers and sorbent pads shall be deployed, if feasible, to contain and recover the spill material;
- If spilled material is released onto a freezing water body, snow and sorbent pads shall be used to contain and clean up the spill. A backhoe, or similar equipment, will remove all materials to prevent future release into the water body;
- Contaminated areas, including downstream shorelines (non-frozen conditions), shall be cleaned up in consultation with Spill Response Specialists and the appropriate Governmental Agencies, and;
- If feasible, a vacuum truck will be brought to the site to skim off the contaminants. As well, the appropriate regulatory agencies will be contacted and a post-break-up monitoring and reclamation plan will be implemented to determine the extent of the impacts of the spill on the water body and its banks.

4.4.3 Spot Spills

- The Water Resource Inspector, (867) 678-6676, is to be contacted soon after a spot spill to determine appropriate methods to remove and/or restore contaminated soils. Since impacts from small spills can generally be minimized if immediate action is taken, all small spot spills shall be cleaned up immediately;
- Activities in the immediate vicinity will be suspended until the INF Regional Superintendent or the INF Marine Manager, or an Inspector from ENR Operations grant permission to resume;
- Heavily contaminated soil and vegetation, and/or removed contaminated materials will be disposed of at an approved licensed waste facility.

- Locations where spot spills have occurred will be flagged and the GPS coordinate location recorded by the Person-in-Charge of the spill. Flags shall be removed once reporting is complete, and;

- The Person-in-Charge of the spill will document and report all details pertaining to the incident.

4.5 Procedures for transferring, storing and managing spill related wastes.

Spills of fluids described table 2.0 will be disposed of in an approved licenced waste disposal facility, hauled out of the Territory or disposed of at an approved facility where the facility license holder is eligible to receive the fuel as authorized by a water license. Fuels cleaned up with absorbent pads or towels will be placed into plastic bags for removal. Contaminated gravel will be shoveled into drums and sealed for transfer to an approved licensed waste disposal facility. Drums will be stored away from the river system at a facility operated by the Department of Infrastructure and will no longer pose a threat to the aquatic receiving environment.

4.6 Procedures for containing and controlling the spill (on land and water)

Initially the type and estimated amount of the spill will be assessed to determine the appropriate course of action. The direction and speed of the spill will also be ascertained to determine the amount of personnel needed and the speed in which the response needs to be undertaken. A location will be picked to best address the need to contain the spill based on its proximity to water. The contingency plan will be on hand aid in the deployment of the next steps should the spill worsen due to unforeseen circumstances

Section 5.0 Resources Inventory

All vehicles and equipment will be equipped with a spill kit that, at minimum, includes the following;

- Sorbent material (i.e. 10 pads, 2 socks or equivalent);
- Disposal container (tarpaulin, pail, barrel);
- Safety gloves, goggles and a shovel.

All fuel and services vehicles will carry a spill kit that includes the following:

- A minimum of 10 kg of sorbent materials (i.e. 200 pads, 12 socks, 10 pillows);
- Sorbent booms;

- Disposal container (tarpaulin, pails, barrel);
- Safety gloves, goggles, and shovels;
- Extra spill kits will be stored at camp or storage locations.

Ferries operations are equipped with:

- 200 feet Oil booms
- Two Tarps
- Six Splash suits

Section 6.0 Procedures for restoring affected areas

When the spill report file is closed and there is no longer an amount of fuel above regulatory detection limits, areas of contamination will be backfilled with gravel or soil as required. The Water Resource inspector will be consulted to determine if there are any further requirements to protect the water resources from potential damage during the backfilling

Section 7.0 Off-Site Resources

Department of Transportation Contacts	Name	Office	Alternate
Primary	Patrick McLaughlin Marine Manager Marine Services	(867) 777-7163	
Alternate	Merle Carpenter Regional Superintendent Inuvik Region	(867) 777-7348	
Alternate	Steve Hagerman Director Marine Services	(867) 874-5105	
	NT 24 Hour Spill Report Line (867)-920-8130		

Inuvik Region (2)

Emergency Services	Inuvik	Fort McPherson	Tsiigehtchic
Police	(867) 777-1111	(867) 952-1111	(867) 952-1111 (Fort McPherson)
Ambulance	(867) 777-4444		
Hospital/Medical	(867) 777-8000	(867) 952-2586	(867) 953-3361
Search and Rescue	1-800-267-7270 (all locations)		
Fire	(867) 777-2222	(867) 952-2222	(867) 953-2222

NWT Regulatory Agencies (3)

Regulatory Agencies	
NWT OHS	(867) 678-2301
NWT OHS (Yellowknife)	1-800-661-0792
NWT Forest Fire	1-800-661-0800
Water Resources Officer	1-867-678-6676
ENR – Environmental Protection	(867) 678-6653
Environment Canada	(867) 669-4730
Fisheries and Oceans Canada (Inuvik)	(867) 777-7500
Fisheries and Oceans Canada (YK)	(867) 669-4900
Mackenzie Valley Land and Water Board	(867) 669-0506
Gwich'in Land and Water Board	(867) 777-6624
Charter Community of Tsiigehtchic	(867) 953-3201
Hamlet of Fort McPherson	(867) 952-2428
Gwichya Gwich'in RRC	(867) 953-3608
Tetlit Gwich'in Council	(867) 952-2330
Tetlit Gwich'in RRC	(867) 952-2330

Contractor (4)

Contractor	Contact Name	Office
New Contractor information will be provided once the contract is awarded March 25, 2022		

Section 8.0 TRAINING PROGRAMS

8.1 Outline of the training program

Comprehensive Spill courses are given at the beginning of each ferry operating season for all Staff and Crews working on the ferries and ferry landings. Spill training is scheduled and completed prior to the Sailing season annually. All participants must be certified as to the completion of Training and confirmed by Signature for Transport Canada records.

Beginning in spring 2017, the Department of Infrastructure Marine North has provided all Marine and Shore Labour Crews with Environmental Spills training and reviews of annual revised SCP and annual revised Standing Orders and procedures for both Ferry locations. This training covered the following elements:

- Review of Marine/Land Environmental laws and regulations,
- Emergency response to fire and explosions,
- Dealing with heat and cold stress,
- WHMIS,
- Site Hazards and substance controls,
- Hazardous materials and site assessments,
- Planning clean ups, organizing materials and site decontamination methods.
- Reporting and Incident Command

8.2 Training Schedule and record keeping

An excel sheet of spill events are kept on record and copies of all spill reports are kept on file for reference and are reviewedperiodically to note any trends, develop operational improvement and guide future planning.

As Spill Training programs are developed or undertaken by INF personnel, a record of the type of training, the location and the contents of the courses will reported annually in a report to the GLWB.

Section 9.0 Ferry Landing Site Satellite Images

9.1 The following general areas represent the extent to which the Spill Contingency Plan for Shoreline Operations applies in the Gwich'in Region under the Peel and Mackenzie River Ferry Licences.

INF or INF Contractors respond to spills within these zones that occur as a result of operations associated with the operation and maintenance of the Ferry Landings.

Private commercial carriers are responsible for their own Spill Response, but INF is expected to assist private carriers where prudence demands. These areas represent the general area used times the 100m OHWM Buffer.

Mackenzie River: Fort McPherson Landing

Mackenzie River: Tsiigehtchic Landing

Mackenzie River: Inuvik landing

Peel River: East (McPherson) and West (Dempster) Landings

Mackenzie River: Fort McPherson Landing

The red square indicates a potential spill location.

The blue arrows indicate the direction of river flow.

Mackenzie River: Tsiigehtchic Landing

The red square indicates a potential spill location.

The blue arrows indicate the direction of river flow.

Mackenzie River: Inuvik landing

The red squares indicate a potential spill location.

The blue arrows indicate the direction of river flow.

Peel River: East (McPherson) and West (Dempster) Landings

The red squares indicate a potential spill location.

The blue arrows indicate the direction of river flow.

Imperial Oil

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: UNIVIS N-C 15
Product Description: Base Oil and Additives
MSDS Number: 8250
Product Code: 201580109790
Intended Use: Hydraulic fluid

COMPANY IDENTIFICATION

Supplier: Imperial Oil Downstream
240 4th Avenue
Calgary, ALBERTA. T2P 3M9 Canada

24 Hour Environmental / Health Emergency Telephone	1-866-232-9563
Transportation Emergency Phone Number	1-866-232-9563
Product Technical Information	1-800-268-3183
Supplier General Contact	1-800-567-3776

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines see Section 15.

HEALTH EFFECTS

If swallowed, may be aspirated and cause lung damage. Frequent or prolonged contact may de-fat and dry the skin, leading to discomfort and dermatitis. May be irritating to the eyes, nose, throat, and lungs. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID:	Health:	1	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	1*	Flammability:	1	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Imperial Oil

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Pressurised mists may form a flammable mixture.

Hazardous Combustion Products: Aldehydes, Oxides of carbon, Incomplete combustion products, Smoke, Fume, Sulphur oxides

FLAMMABILITY PROPERTIES

Flash Point [Method]: 198°C (388°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

PROTECTIVE MEASURES

Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

For emergency responders: Respiratory protection: respiratory protection will be necessary only in special cases, e.g., formation of mists. Half-face or full-face respirator with filter(s) for dust/organic vapor or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to hydrocarbons are recommended. Gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do so without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Avoid contact with skin. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Do not store in open or unlabelled containers. Keep away from incompatible materials.

Imperial Oil

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Substance Name	Form	Limit/Standard			Note	Source
LUBRICATING OILS (PETROLEUM), HYDROTREATED NEUTRAL OIL-BASED	Inhalable fraction.	TWA	5 mg/m3			ACGIH

Exposure limits/standards for materials that can be formed when handling this product: When mists/aerosols can occur the following is recommended: 5 mg/m³ - ACGIH TLV (inhalable fraction).

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

If prolonged or repeated contact is likely, chemical-resistant gloves are recommended. If contact with forearms is likely, wear gauntlet-style gloves.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after

Imperial Oil

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. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Colour: Amber
Odour: Characteristic
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.839
Flash Point [Method]: 198°C (388°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316°C (601°F)
Vapour Density (Air = 1): N/D
Vapour Pressure: < 0.013 kPa (0.1 mm Hg) at 20°C
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 15 cSt (15 mm2/sec) at 40°C | 3.73 cSt (3.73 mm2/sec) at 100°C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -57°C (-71°F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt
Decomposition Temperature: N/D

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

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HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs.
Ingestion	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	May dry the skin leading to discomfort and dermatitis. Based on assessment of the components.
Eye	
Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.

CHRONIC/OTHER EFFECTS

For the product itself:

Repeated and/or prolonged exposure may cause irritation to the skin, eyes, or respiratory tract. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitising in test animals.

CMR Status: None.

Chemical Name	CAS Number	List Citations
LUBRICATING OILS (PETROLEUM), HYDROTREATED NEUTRAL OIL-BASED	72623-86-0	4

--REGULATORY LISTS SEARCHED--

1 = IARC 1
2 = IARC 2A
3 = IARC 2B
4 = ACGIH ALL
5 = ACGIH A1
6 = ACGIH A2

SECTION 12 ECOLOGICAL INFORMATION

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The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Protect the environment. Dispose of used oil at designated sites. Minimize skin contact. Do not mix used oils with solvents, brake fluids or coolants.

REGULATORY DISPOSAL INFORMATION

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (TDG): Not Regulated for Land Transport

LAND (DOT): Not Regulated for Land Transport

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SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

WHMIS Classification: Not controlled

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

CEPA: All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

Listed or exempt from listing/notification on the following chemical inventories: AICS, DSL, ENCS, IECSC, KECI, PICCS, TSCA

The Following Ingredients are Cited on the Lists Below: None.

--REGULATORY LISTS SEARCHED--

1 = TSCA 4	3 = TSCA 5e	5 = TSCA 12b
2 = TSCA 5a2	4 = TSCA 6	6 = NPRI

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Revision Changes:
Section 08: Protective Measures information was modified.
Section 11: Skin Irritation Conclusion information was modified.
Section 01: Company Mailing Address information was modified.
Section 16: Not determined, Not applicable information was modified.
Hazard Identification: NFPA Health information was modified.
Hazard Identification: HMIS Health information was modified.
Section 05: Hazardous Combustion Products information was modified.
Section 15: National Chemical Inventory Listing - Header information was modified.
Section 08: Exposure Limits Table information was added.
Section 09: Decomposition Temperature information was added.
Section 09: Decomposition Temp - Header information was added.
Section 11: Chemical Name - Header information was added.
Section 11: CAS Number - Header information was added.
Section 11: List Citation - Header information was added.

Imperial Oil

Section 11: Tox List Cited Table information was added.
Section 08: OEL Table - Substance Name Column - Header information was added.
Section 08: OEL Table - Form Column - Header information was added.
Section 08: OEL Table - Limit Column - Header information was added.
Section 08: OEL Table - Notation Column - Header information was added.
Section 08: OEL Table - Source Column - Header information was added.

WHMIS Classification: Not controlled

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DGN: 5007186 (1018609)

Prepared by: Imperial Oil Limited, IH and Product Safety

Imperial Oil

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: UNIVIS N-C 22
Product Description: Base Oil and Additives
MSDS Number: 8258
Product Code: 201580109795
Intended Use: Hydraulic fluid

COMPANY IDENTIFICATION

Supplier: Imperial Oil Downstream
240 4th Avenue
Calgary, ALBERTA. T2P 3M9 Canada

24 Hour Environmental / Health Emergency Telephone	1-866-232-9563
Transportation Emergency Phone Number	1-866-232-9563
Product Technical Information	1-800-268-3163
Supplier General Contact	1-800-567-3776

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines see Section 15.

HEALTH EFFECTS

Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use

adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Pressurised mists may form a flammable mixture.

Hazardous Combustion Products: Incomplete combustion products, Oxides of carbon, Smoke, Fume, Sulphur oxides, Aldehydes

FLAMMABILITY PROPERTIES

Flash Point [Method]: 202°C (396°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

PROTECTIVE MEASURES

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Avoid contact with spilled material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

For emergency responders: Respiratory protection: respiratory protection will be necessary only in special cases, e.g., formation of mists. Half-face or full-face respirator with filter(s) for dust/organic vapor or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to hydrocarbons are recommended. Gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do so without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Do not store in open or unlabelled containers. Keep away from incompatible materials.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: When mists/aerosols can occur the following is recommended: 5 mg/m³ - ACGIH TLV (inhalable fraction).

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:
No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:
No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:
No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:
No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing 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. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

Imperial Oil

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Colour: Amber
Odour: Characteristic
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.843
Flash Point [Method]: 202°C (396°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316°C (601°F)
Vapour Density (Air = 1): > 2 at 101 kPa
Vapour Pressure: < 0.013 kPa (0.1 mm Hg) at 20°C
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 22 cSt (22 mm2/sec) at 40°C | 5.01 cSt (5.01 mm2/sec) at 100°C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -54°C (-65°F)
DMSO Extract (mineral oil only), IP-346: < 3 %wt
Decomposition Temperature: N/D

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.

Imperial Oil

Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures.
Ingestion	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.

CHRONIC/OTHER EFFECTS

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitising in test animals.

CMR Status: None.

--REGULATORY LISTS SEARCHED--

1 = IARC 1
2 = IARC 2A
3 = IARC 2B
4 = ACGIH ALL
5 = ACGIH A1
6 = ACGIH A2

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component – Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

Imperial Oil

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (TDG): Not Regulated for Land Transport

LAND (DOT): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

WHMIS Classification: Not controlled

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

CEPA: All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

Listed or exempt from listing/notification on the following chemical inventories: AICS, DSL, ENCS, IECSC, KECI, PICCS, TSCA

The Following Ingredients are Cited on the Lists Below: None.

Imperial Oil

--REGULATORY LISTS SEARCHED--

1 = TSCA 4
2 = TSCA 5a2
3 = TSCA 5e
4 = TSCA 6
5 = TSCA 12b
6 = NPRI

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:
Section 01: Company Mailing Address information was modified.
Section 16: Not determined, Not applicable information was modified.
Section 09: Decomposition Temp - Header information was added.
Section 15: National Chemical Inventory Listing - Header information was modified.
Section 09: Decomposition Temperature information was added.
Section 05: Hazardous Combustion Products information was modified.

WHMIS Classification: Not controlled

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DGN: 5007199 (1018615)

Prepared by: Imperial Oil Limited, IH and Product Safety

Esso Imperial Oil

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: (see Section 16 for Synonyms) **LIGHT DISTILLATE**
Product Description: Petroleum Distillates
MSDS Number: 8528
Product Code: 10102015
Intended Use: Fuel/solvent/blend stock

COMPANY IDENTIFICATION

Supplier: **Imperial Oil Downstream**
240 4th Avenue
Calgary, ALBERTA. T2P 3M9 Canada

24 Hour Environmental / Health Emergency Telephone	1-866-232-9563
Transportation Emergency Phone Number	1-866-232-9563
Product Technical Information	1-800-268-3183
Supplier General Contact	1-800-567-3776

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*	Acute Toxicity
KEROSENE, STRAIGHT RUN	8008-20-6	0 - 100%	None
LIGHT ATMOSPHERIC GAS OIL	64741-44-2	0 - 100%	None
LIGHT HYDROCRACKED DISTILLATE (PETROLEUM)	64741-77-1	0 - 100%	None

Hazardous Constituent(s) Contained in Complex Substance(s)

Name	CAS#	Concentration*	Acute Toxicity
NAPHTHALENE	91-20-3	< 1%	Inhalation Lethality: LC50 > 0.4 mg/l (Rat); Oral Lethality: LD50 710 mg/kg (Mouse). Oral Lethality: LD50 533 mg/kg (Mouse)

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

SECTION 3 HAZARDS IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

PHYSICAL/CHEMICAL EFFECTS

Combustible. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an ignition.

HEALTH EFFECTS

Irritating to skin. If swallowed, may be aspirated and cause lung damage. May be irritating to the eyes, nose, throat, and lungs. Breathing of high vapour concentrations may cause dizziness, light-headedness, headache,

Imperial Oil

nausea and loss of co-ordination. Continued inhalation may result in unconsciousness. High-pressure injection under skin may cause serious damage.

Target Organs: Skin

NFPA Hazard ID:	Health:	2	Flammability:	2	Reactivity:	0
HMIS Hazard ID:	Health:	2*	Flammability:	2	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Immediately remove from further exposure. Get immediate medical assistance. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. Give supplemental oxygen, if available. If breathing has stopped, assist ventilation with a mechanical device.

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

Contains hydrocarbon solvent/petroleum hydrocarbons; skin contact may aggravate an existing dermatitis.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO_2) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Combustible. Vapour is flammable and heavier than air. Vapour may travel across the ground and reach remote ignition sources, causing a flashback fire danger. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

Hazardous Combustion Products: Oxides of carbon, Sulphur oxides, Aldehydes, Smoke, Fume, Incomplete combustion products

FLAMMABILITY PROPERTIES

Flash Point [Method]: 40°C (104°F) [ASTM D-93]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapour, but may not prevent ignition in enclosed spaces.

Water Spill: Stop leak if you can do so without risk. Eliminate sources of ignition. Warn other shipping. If the Flash Point exceeds the Ambient Temperature by 10 deg C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. If the Flash Point does not exceed the Ambient Air Temperature by at least 10C, use booms as a barrier to protect shorelines and allow material to evaporate. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

Imperial Oil

SECTION 7 HANDLING AND STORAGE

HANDLING

Avoid breathing mists or vapour. Avoid all personal contact. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Loading/Unloading Temperature: N/D

Transport Temperature: N/D
Transport Pressure: N/D

Static Accumulator: This material is a static accumulator.

STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be earthed and bonded. Fixed storage containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.
Storage Temperature: N/D
Storage Pressure: N/D

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Substance Name	Form	Limit/Standard			Note	Source
KEROSENE, STRAIGHT RUN	Stable Aerosol.	TWA	5 mg/m3			Supplier
KEROSENE, STRAIGHT RUN	Vapour.	TWA	200 mg/m3			Supplier
KEROSENE, STRAIGHT RUN [as total hydrocarbon vapor]	Non-Aerosol	TWA	200 mg/m3		Skin	ACGIH
LIGHT ATMOSPHERIC GAS OIL	Stable Aerosol.	TWA	5 mg/m3			Supplier
LIGHT ATMOSPHERIC GAS OIL	Vapour.	TWA	200 mg/m3			Supplier
LIGHT HYDROCRACKED DISTILLATE (PETROLEUM)	Stable Aerosol.	TWA	5 mg/m3			Supplier
LIGHT HYDROCRACKED DISTILLATE (PETROLEUM)	Vapour.	TWA	200 mg/m3			Supplier
NAPHTHALENE		TWA	10 ppm		Skin	ACGIH

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Use explosion-proof ventilation equipment to stay below exposure limits.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

Half-face filter respirator

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

Chemical resistant gloves are recommended.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

Chemical/oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing 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. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Colour: Pale Yellow
Odour: Petroleum/Solvent
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.85
Flash Point [Method]: 40°C (104°F) [ASTM D-93]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D
Boiling Point / Range: 180°C (356°F) - 320°C (608°F) [Estimated]
Vapour Density (Air = 1): N/D
Vapour Pressure: [N/D at 20°C] | < 1 kPa (7.5 mm Hg) at 38°C
Evaporation Rate (n-butyl acetate = 1): < 1
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): N/D
Solubility in Water: Negligible
Viscosity: 1.7 cSt (1.7 mm2/sec) at 40°C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -39°C (-38°F)
Decomposition Temperature: N/D

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Avoid heat, sparks, open flames and other ignition sources.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity: No end point data for material.	Moderately toxic. Based on assessment of the components.
Irritation: No end point data for material.	Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs
Ingestion	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Moderately irritating to skin with prolonged exposure. Based on assessment of the components.
Eye	
Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on

Imperial Oil

	assessment of the components.

CHRONIC/OTHER EFFECTS

For the product itself:

Vapour/aerosol concentrations above recommended exposure levels are irritating to the eyes and respiratory tract, may cause headaches, dizziness, anaesthesia, drowsiness, unconsciousness and other central nervous system effects including death. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Contains:

KEROSENE: Carcinogenic in animal tests. Lifetime skin painting tests produced tumours, but the mechanism is due to repeated cycles of skin damage and restorative hyperplasia. This mechanism is considered unlikely in humans where such prolonged skin irritation would not be tolerated. Did not cause mutations in-vitro. Inhalation of vapours did not result in reproductive or developmental effects in laboratory animals. Inhalation of high concentrations in animals resulted in respiratory tract irritation, lung changes and some reduction in lung function. Non-sensitizing in animal tests. MIDDLE DISTILLATES WITH CRACKED STOCKS: Carcinogenic in animal tests. Caused mutations in-vitro. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased fetal resorptions at maternally toxic doses. Dermal exposure to high concentrations resulted in severe skin irritation with weight loss and some mortality. Inhalation exposure to high concentrations resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and reduction in lung function. NAPHTHALENE: Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts. Naphthalene caused cancer in laboratory animal studies, but the relevance of these findings to humans is uncertain.

CMR Status:

Chemical Name	CAS Number	List Citations
KEROSENE, STRAIGHT RUN	8008-20-6	4
NAPHTHALENE	91-20-3	3, 4

--REGULATORY LISTS SEARCHED--

1 = IARC 1
2 = IARC 2A
3 = IARC 2B
4 = ACGIH ALL
5 = ACGIH A1
6 = ACGIH A2

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

High molecular wt. component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

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PERSISTENCE AND DEGRADABILITY

Biodegradation:

Majority of components -- Expected to be inherently biodegradable

Atmospheric Oxidation:

More volatile component -- Expected to degrade rapidly in air

BIOACCUMULATION POTENTIAL

Majority of components -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (TDG)

Proper Shipping Name: FUEL OIL (Kerosene)
Hazard Class & Division: 3
UN Number: 1202
Packing Group: III
Marine Pollutant: Yes

Footnote: Marine Pollutant designation is applicable only if shipped over water.

LAND (DOT)

Proper Shipping Name: DIESEL FUEL
Hazard Class & Division: 3
ID Number: 1993
Packing Group: III
ERG Number: 128

Imperial Oil

Label(s): None
Transport Document Name: UN1993, DIESEL FUEL, 3, PG III

Footnote: The flash point of this material is greater than 38°C/100°F. Regulatory classification of this material varies. DOT: Flammable liquid or combustible liquid. OSHA: Combustible liquid. IATA/IMO: Flammable liquid. This material is not regulated under 49 CFR in a container of 450 litre/119 gallon capacity or less when transported solely by land, as long as the material is not a hazardous waste, a marine pollutant, or specifically listed as a hazardous substance.

SEA (IMDG)

Proper Shipping Name: HEATING OIL, LIGHT
Hazard Class & Division: 3
EMS Number: F-E, S-E
UN Number: 1202
Packing Group: III
Marine Pollutant: Yes
Label(s): 3
Transport Document Name: UN1202, HEATING OIL, LIGHT, 3, PG III, (40°C c.c.), MARINE POLLUTANT

AIR (IATA)

Proper Shipping Name: HEATING OIL, LIGHT
Hazard Class & Division: 3
UN Number: 1202
Packing Group: III
Label(s) / Mark(s): 3
Transport Document Name: UN1202, HEATING OIL, LIGHT, 3, PG III

SECTION 15 REGULATORY INFORMATION

WHMIS Classification: Class B, Division 3: Combustible Liquids Class D, Division 2, Subdivision B: Toxic Material

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

CEPA: All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

Listed or exempt from listing/notification on the following chemical inventories: DSL, TSCA
Special Cases:

Inventory	Status
AICS	Not determined
ENCS	Not determined
IECSC	Not determined
KECI	Not determined
PICCS	Not determined

Imperial Oil

The Following Ingredients are Cited on the Lists Below: None.

--REGULATORY LISTS SEARCHED--

1 = TSCA 4	3 = TSCA 5e	5 = TSCA 12b
2 = TSCA 5a2	4 = TSCA 6	6 = NPRI

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Revision Changes:
Section 04: First Aid Inhalation Information was modified.
Section 01: Company Mailing Address information was modified.
Section 11: Inhalation Lethality Conclusion Information was modified.
Section 16: Not determined, Not applicable information was modified.
Section 09: Vapour Pressure Information was modified.
Section 07: Handling and Storage-Handling Information was modified.
Section 07: Loading/Unloading Temperature °C(°F) Information was modified.
Section 11: Dermal Lethality Test Data information was modified.
Section 11: Dermal Lethality Test Comment information was modified.
Section 11: Oral Lethality Test Data information was modified.
Section 11: Inhalation Lethality Test Data information was modified.
Section 11: Dermal Irritation Test Data information was modified.
Section 11: Eye Irritation Test Data information was modified.
Section 11: Oral Lethality Test Comment information was modified.
Section 11: Inhalation Lethality Test Comment information was modified.
Section 11: Dermal Irritation Test Comment information was modified.
Section 11: Eye Irritation Test Comment information was modified.
Section 05: Hazardous Combustion Products information was modified.
Section 08: Respiratory Protection information was modified.
Section 11: Inhalation Lethality Test Comment information was modified.
Section 15: National Chemical Inventory Listing - Header information was modified.
Section 16: MSN,MAT ID information was modified.
Composition: Component table information was modified.
Section 08: Exposure Limits Table information was modified.
Section 16: Precautions information was modified.
Section 15: List Citation Table - Header information was modified.
Section 11: Other Health Effects Information was added.
Section 16: First Aid Inhalation information was added.
Section 16: First Aid Inhalation - Header information was added.
Section 15: Canadian List Citations Table information was deleted.
Section 15: Chemical Name - Header information was deleted.
Section 15: CAS Number - Header information was deleted.
Section 15: List Citations -Header information was deleted.
SYNONYMS: AUTOMOTIVE (ON-ROAD) DIESEL FUEL, DIESEL ARCTIC, DIESEL FUEL, DIESEL LOW SULPHUR LIGHT, DIESEL LOW SULPHUR LIGHT DYED, DIESEL LOW SULPHUR LIGHT RAIL, DIESEL REGULAR

Imperial Oil

SULPHUR LIGHT DYED, FURNACE FUEL LIGHT, FURNACE FUEL LIGHT DYED, MC SOLVENT, STOVE OIL, STOVE OIL DYED

PRECAUTIONARY LABEL TEXT:
WHMIS Classification: Class B, Division 3: Combustible Liquids Class D, Division 2, Subdivision B: Toxic Material

HEALTH HAZARDS
Irritating to skin. If swallowed, may be aspirated and cause lung damage.

Target Organs: Skin

PHYSICAL HAZARDS
Combustible. In use, may form flammable/explosive vapour-air mixture. Material can accumulate static charges which may cause an ignition.

PRECAUTIONS
Avoid breathing mists or vapour. Avoid all personal contact. Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation.

FIRST AID
Inhalation: Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

Eye: Flush thoroughly with water. If irritation occurs, get medical assistance.

Oral: Seek immediate medical attention. Do not induce vomiting.

Skin: Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

FIRE FIGHTING MEDIA
Use water fog, foam, dry chemical or carbon dioxide (CO_2) to extinguish flames.

SPILL/LEAK
Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

Water Spill: Stop leak if you can do so without risk. Eliminate sources of ignition. Warn other shipping. Report spills as required to appropriate authorities. If the Flash Point exceeds the Ambient Temperature by 10 deg C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. If the Flash Point does not exceed the Ambient Air Temperature by at least 10C, use booms as a barrier to protect shorelines and allow material to evaporate. Seek the advice of a specialist before using dispersants.

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DGN: 5007490 (552455)

Prepared by Imperial Oil Limited, IH and Product Safety

Material Safety Data Sheet

1. MATERIAL AND COMPANY IDENTIFICATION

Material Name	:	**Shell Rotella T Triple Protection 15W-40**
Product Code	:	001D5439
Uses	:	Engine oil.
Manufacturer/Supplier	:	**Shell Oil Products US** P.O. Box 4427 Houston TX 77210-4427 USA
SDS Request	:	(+1) 877-276-7285

Emergency Telephone Number

Spill Information	:	877-242-7400
Health Information	:	877-504-9351

2. COMPOSITION/INFORMATION ON INGREDIENTS

Highly refined mineral oils and additives.
The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance and Odour	:	Amber. Liquid at room temperature. Slight hydrocarbon.
Health Hazards	:	Not classified as dangerous for supply or conveyance.
Safety Hazards	:	Not classified as flammable but will burn.
Environmental Hazards	:	Not classified as dangerous for the environment.

Health Hazards	:	Not expected to be a health hazard when used under normal conditions.
Health Hazards		
Inhalation	:	Under normal conditions of use, this is not expected to be a primary route of exposure.
Skin Contact	:	Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Eye Contact	:	May cause slight irritation to eyes.
Ingestion	:	Low toxicity if swallowed.
Other Information	:	Used oil may contain harmful impurities.
Signs and Symptoms	:	Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.
Aggravated Medical Conditions	:	Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this material: Skin.

Environmental Hazards	:	Not classified as dangerous for the environment.
Additional Information	:	Under normal conditions of use or in a foreseeable emergency, this product does not meet the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

4. FIRST-AID MEASURES

General Information	:	Not expected to be a health hazard when used under normal conditions.
Inhalation	:	No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice.
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.
Eye Contact	:	Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.
Ingestion	:	In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.
Advice to Physician	:	Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Flash point	:	Typical 204 °C / 399 °F (COC)
Upper / lower Flammability or Explosion limits	:	Typical 1 - 10 %(V)(based on mineral oil)
Auto ignition temperature	:	> 320 °C / 608 °F
Specific Hazards	:	Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide may be evolved if incomplete combustion occurs. Unidentified organic and inorganic compounds.
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 water in a jet.
Protective Equipment for Firefighters	:	Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. See Chapter 13 for information on disposal. Observe the relevant local and international regulations.

Protective measures	:	Avoid contact with skin and eyes. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or

other appropriate barriers.

Clean Up Methods : Slippery when spilt. Avoid accidents, clean up immediately. Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.

Additional Advice : Local authorities should be advised if significant spillages cannot be contained.

7. HANDLING AND STORAGE

General Precautions : Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. 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.

Handling : Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.

Storage : Keep container tightly closed and in a cool, well-ventilated place. Use properly labelled and closeable containers. Store at ambient temperature.

Product Transfer : This material has the potential to be a static accumulator. Proper grounding and bonding procedures should be used during all bulk transfer operations.

Recommended Materials : For containers or container linings, use mild steel or high density polyethylene.

Unsuitable Materials : PVC.

Additional Information : Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Material	Source	Type	ppm	mg/m3	Notation
Oil mist, mineral	ACGIH	TWA(Inhalable fraction.)		5 mg/m3	
Oil mist, mineral	OSHA Z1	PEL(Mist.)		5 mg/m3	

Biological Exposure Index (BEI)
No biological limit allocated.

Exposure Controls	:	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: Adequate ventilation to control airborne concentrations. Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated. 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 for subsequent recycle. 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.
Personal Protective Equipment	:	Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
Respiratory Protection	:	No respiratory protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material. 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 suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapours [boiling point >65°C(149 °F)].
Hand Protection	:	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: PVC, neoprene or nitrile rubber gloves. 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. 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 recognise that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time may be 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.
Eye Protection	:	Wear safety glasses or full face shield if splashes are likely to occur.
Protective Clothing	:	Skin protection not ordinarily required beyond standard issue work clothes.
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
Environmental Exposure Controls	:	Take appropriate measures to fulfil the requirements of relevant environmental protection legislation. Avoid contamination of the environment by following advice given in Chapter 6. If necessary, prevent undissolved material from being discharged to waste water. Waste water should be treated in a municipal or industrial waste water treatment plant before discharge to surface water. Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Amber. Liquid at room temperature.
Odour	:	Slight hydrocarbon.
pH	:	Not applicable.

Initial Boiling Point and Boiling Range	:	> 280 °C / 536 °F estimated value(s)
Pour point	:	Typical -30 °C / -22 °F
Flash point	:	Typical 204 °C / 399 °F (COC)
Upper / lower Flammability or Explosion limits	:	Typical 1 - 10 %(V) (based on mineral oil)
Auto-ignition temperature	:	> 320 °C / 608 °F
Vapour pressure	:	< 0.5 Pa at 20 °C / 68 °F (estimated value(s))
Specific gravity	:	Typical 0.88 at 15 °C / 59 °F
Density	:	Typical 879 kg/m3 at 15 °C / 59 °F
Water solubility	:	Negligible.
n-octanol/water partition coefficient (log Pow)	:	> 6 (based on information on similar products)
Kinematic viscosity	:	Typical 120 mm2/s at 40 °C / 104 °F
Vapour density (air=1)	:	> 1 (estimated value(s))
Electrical conductivity	:	This material is not expected to be a static accumulator.
Evaporation rate (nBuAc=1)	:	Data not available

10. STABILITY AND REACTIVITY

Stability	:	Stable.
Conditions to Avoid	:	Extremes of temperature and direct sunlight.
Materials to Avoid	:	Strong oxidising agents.
Hazardous Decomposition Products	:	Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	:	Information given is based on data on 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).
Acute Oral Toxicity	:	Expected to be of low toxicity: LD50 > 5000 mg/kg , Rat
Acute Dermal Toxicity	:	Expected to be of low toxicity: LD50 > 5000 mg/kg , Rabbit
Acute Inhalation Toxicity	:	Not considered to be an inhalation hazard under normal conditions of use.
Skin Irritation	:	Expected to be slightly irritating. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Eye Irritation	:	Expected to be slightly irritating.
Respiratory Irritation	:	Inhalation of vapours or mists may cause irritation.
Sensitisation	:	Not expected to be a skin sensitiser.
Repeated Dose Toxicity	:	Not expected to be a hazard.
Mutagenicity	:	Not considered a mutagenic hazard.
Carcinogenicity	:	Not expected to be carcinogenic. Product contains mineral oils of types shown to be non-carcinogenic in animal skin-painting studies. Highly refined mineral oils are not classified as carcinogenic by the International Agency for Research on Cancer (IARC).

Material	:	Carcinogenicit Classification
Highly refined mineral oil (IP346 <3%)	:	ACGIH Group A4: Not classifiable as a human carcinogen.
Highly refined mineral oil IP346 <3%	:	IARC 3: Not classifiable as to carcinogenicity to humans.
Highly refined mineral oil IP346 <3%)	:	GHS / CLP No carcinogenicity classification

Reproductive and Developmental Toxicity : Not expected to be a hazard.

Additional Information : Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible. Continuous contact with used engine oils has caused skin cancer in animal tests.

12. ECOLOGICAL INFORMATION

Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Acute Toxicity : Poorly soluble mixture. May cause physical fouling of aquatic organisms. Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l (to aquatic organisms) LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract. Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.

Mobility : Liquid under most environmental conditions. If it enters soil, it will adsorb to soil particles and will not be mobile. Floats on water.

Persistence/degradability : Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.

Bioaccumulation : Contains components with the potential to bioaccumulate.

Other Adverse Effects : Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

13. DISPOSAL CONSIDERATIONS

Material Disposal : 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. Do not dispose into the environment, in drains or in water courses.
Container Disposal	:	Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
Local Legislation	:	Disposal should be in accordance with applicable regional, national, and local laws and regulations.

14. TRANSPORT INFORMATION

US Department of Transportation Classification (49CFR)
This material is not subject to DOT regulations under 49 CFR Parts 171-180.

IMDG
This material is not classified as dangerous under IMDG regulations.

IATA (Country variations may apply)
This material is either not classified as dangerous under IATA regulations or needs to follow country specific requirements.

15. REGULATORY INFORMATION

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

Federal Regulatory Status

Notification Status

EINECS	All components listed or polymer exempt.
TSCA	All components listed.
DSL	All components listed.

Shell classifies this material as an "oil" under the CERCLA Petroleum Exclusion, therefore releases to the environment are not reportable under CERCLA.

SARA Hazard Categories (311/312)
No SARA 311/312 Hazards.

State Regulatory Status

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)

This material does not contain any chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

16. OTHER INFORMATION

NFPA Rating (Health, Fire, Reactivity)	:	0, 1, 0
SDS Version Number	:	1.4
SDS Effective Date	:	02/05/2014
SDS Revisions	:	A vertical bar (|) in the left margin indicates an amendment from the previous version.
SDS Regulation	:	The content and format of this MSDS is in accordance with the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
SDS Distribution	:	The information in this document should be made available to all who may handle the product.
Disclaimer	:	The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.

Imperial Oil

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: (see Section 16 for Synonyms) **UNLEADED GASOLINE**
Product Description: Hydrocarbons and Additives
MSDS Number: 8522

Intended Use: Fuel

COMPANY IDENTIFICATION

Supplier: Imperial Oil Downstream
240 4th Avenue
Calgary, ALBERTA T2P 3M9 Canada

24 Hour Environmental / Health Emergency Telephone	1-866-232-9563
Transportation Emergency Phone Number	1-866-232-9563
Product Technical Information	1-800-268-3183
Supplier General Contact	1-800-567-3776

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*	Acute Toxicity
ETHYL ALCOHOL	64-17-5	0 - 1%	None
GASOLINE	86290-81-5	> 99 %	None
METHYL-TERT-BUTYL ETHER	1634-04-4	0 - 1%	Oral Lethality: LD50 4000 mg/kg (Rat)

Hazardous Constituent(s) Contained in Complex Substance(s)

Name	CAS#	Concentration*	Acute Toxicity
BENZENE	71-43-2	0 - 1.5%	None
CUMENE	98-82-8	0 - 1%	None
CYCLOHEXANE	110-82-7	0 - 1.5%	None
ETHYL BENZENE	100-41-4	0 - 3.5%	Inhalation Lethality: LC50 17.8 mg/l (Rat); Oral Lethality: LD50 3.5 g/kg (Rat)
n-Hexane	110-54-3	0 - 5%	None
NAPHTHALENE	91-20-3	0 - 1%	Inhalation Lethality: LC50 > 0.4 mg/l (Rat); Oral Lethality: LD50 710 mg/kg (Mouse); Oral Lethality: LD50 533 mg/kg (Mouse)
TOLUENE	108-88-3	0 - 20%	None
XYLENES	1330-20-7	0 - 20%	None

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

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NOTE: The concentration of the components shown above may vary substantially. In certain countries, benzene content may be limited to lower levels. Oxygenates such as tertiary-amyl-methyl ether, ethanol, di-isopropyl ether, and ethyl-tertiary-butyl ether may be present. Because of volatility considerations, gasoline vapor may have concentrations of components very different from those of liquid gasoline. The major components of gasoline vapor are: butane, isobutane, pentane, and isopentane. The reportable component percentages, shown in the composition/information on ingredients section, are based on API's evaluation of a typical gasoline mixture.

SECTION 3 HAZARDS IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

PHYSICAL/CHEMICAL EFFECTS

FLAMMABLE. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an ignition.

HEALTH EFFECTS

May cause cancer. Repeated exposure may cause skin dryness or cracking. If swallowed, may be aspirated and cause lung damage. May be irritating to the eyes, nose, throat, and lungs. May cause central nervous system depression. High-pressure injection under skin may cause serious damage. Exposure to benzene is associated with cancer (acute myeloid leukaemia and myelodysplastic syndrome), damage to the blood-producing system, and serious blood disorders (see Section 11).

NFPA Hazard ID:	Health:	1	Flammability:	3	Reactivity:	0
HMIS Hazard ID:	Health:	1*	Flammability:	3	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

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This light hydrocarbon material, or a component, may be associated with cardiac sensitisation following very high exposures (well above occupational exposure limits) or with concurrent exposure to high stress levels or heart-stimulating substances like epinephrine. Administration of such substances should be avoided.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. If a leak or spill has not ignited, use water spray to disperse the vapours and to protect personnel attempting to stop a leak. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Extremely Flammable. Vapour is flammable and heavier than air. Vapour may travel across the ground and reach remote ignition sources, causing a flashback fire danger.

Hazardous Combustion Products: Sulphur oxides, Aldehydes, Oxides of carbon, Incomplete combustion products, Smoke, Fume

FLAMMABILITY PROPERTIES

Flash Point [Method]: -40°C (-40°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 1.4 UEL: 7.6
Autoignition Temperature: >250°C (482°F)

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

For emergency responders: Respiratory protection: half-face or full-face respirator with filter(s) for organic vapor and, when applicable, H2S, or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to aromatic hydrocarbons are recommended. Note: gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills:

full body suit of chemical resistant, antistatic material is recommended.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapour, but may not prevent ignition in enclosed spaces.

Water Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Avoid breathing mists or vapour. Avoid all personal contact. Prevent exposure to ignition sources, for example use non-sparking tools and explosion-proof equipment. Potentially toxic/irritating fumes/vapour may be evolved from heated or agitated material. Do not siphon by mouth. Use only with adequate ventilation. Do not use as a cleaning solvent or other non-motor fuel uses. For use as a motor fuel only. It is dangerous and/or unlawful to put petrol into unapproved containers. Do not fill container while it is in or on a vehicle. Static electricity may ignite vapour and cause fire. Place container on ground when filling and keep nozzle in contact with container. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers or other electronic devices etc) in or around any fuelling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator. A liquid is typically considered a nonconductive, static accumulator if its conductivity is below 100 pS/m (100x10E-12 Siemens per meter) and is considered a semiconductive, static accumulator 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, anti-static additives and filtration can greatly influence the conductivity of a liquid.

STORAGE

Ample fire water supply should be available. A fixed sprinkler/deluge system is recommended. The container

choice, for example storage vessel, may effect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Outside or detached storage preferred. Storage containers should be earthed and bonded. Fixed storage containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Substance Name	Form	Limit/Standard			Note	Source
BENZENE		STEL	1 ppm			Supplier
BENZENE		TWA	0.5 ppm			Supplier
BENZENE		STEL	2.5 ppm		Skin	ACGIH
BENZENE		TWA	0.5 ppm		Skin	ACGIH
CUMENE		TWA	50 ppm			ACGIH
CYCLOHEXANE		TWA	100 ppm			ACGIH
ETHYL ALCOHOL		STEL	1000 ppm			ACGIH
ETHYL BENZENE		TWA	20 ppm			ACGIH
GASOLINE		STEL	200 ppm			Supplier
GASOLINE		TWA	100 ppm			Supplier
GASOLINE	Vapour.	TWA	300 mg/m3	100 ppm		Supplier
GASOLINE		STEL	500 ppm			ACGIH
GASOLINE		TWA	300 ppm			ACGIH
METHYL-TERT-BUTYL ETHER		TWA	50 ppm			ACGIH
n-Hexane		TWA	50 ppm		Skin	ACGIH
NAPHTHALENE		TWA	10 ppm		Skin	ACGIH
TOLUENE		TWA	20 ppm			ACGIH
XYLENES		STEL	150 ppm			ACGIH
XYLENES		TWA	100 ppm			ACGIH

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Use explosion-proof ventilation equipment to stay below exposure limits.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No protection is ordinarily required under normal conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode.

Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

Chemical resistant gloves are recommended.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

Chemical/oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing 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. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Colour: Clear (May Be Dyed)
Odour: Petroleum/Solvent
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.74
Flash Point [Method]: -40°C (-40°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 1.4 UEL: 7.6
Autoignition Temperature: >250°C (482°F)
Boiling Point / Range: > 20°C (68°F) - 225°C (437°F)
Vapour Density (Air = 1): 3.2 at 101 kPa
Vapour Pressure: > 26.6 kPa (200 mm Hg) at 20°C | 76 kPa (570 mm Hg) at 38 °C - 103 kPa (772.5 mm Hg) at 38°C
Evaporation Rate (n-butyl acetate = 1): > 10
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3
Solubility in Water: Negligible
Viscosity: <1 cSt (1 mm2/sec) at 40°C
Oxidizing Properties: See Hazards Identification Section.

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OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Decomposition Temperature: N/D

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Avoid heat, sparks, open flames and other ignition sources.

MATERIALS TO AVOID: Halogens, Strong Acids, Alkalies, Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs.
Ingestion	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Mildly irritating to skin with prolonged exposure. Based on assessment of the components.
Eye	
Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.

CHRONIC/OTHER EFFECTS

For the product itself:

Laboratory animal studies have shown that prolonged and repeated inhalation exposure to light hydrocarbon vapours in the same boiling range as this product can produce adverse kidney effects in male rats. However, these effects were not observed in similar studies with female rats, male and female mice, or in limited studies with other animal species. Additionally, in a number of human studies, there was no clinical evidence of such effects at normal occupational levels. In 1991, The U.S. EPA determined that the male rat kidney is not useful for assessing human risk. Vapour concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anaesthetic and may have other central nervous system effects. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema. Very high exposure (confined spaces / abuse) to light hydrocarbons may result in abnormal heart rhythm (arrhythmias). Concurrent high stress levels and/or co-exposure to high levels of hydrocarbons (above occupational exposure limits), and to

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heart-stimulating substances like epinephrine, nasal decongestants, asthma drugs, or cardiovascular drugs may initiate arrhythmias.

Contains:

BENZENE: Caused cancer (acute myeloid leukemia and myelodysplastic syndrome), damage to the blood-producing system, and serious blood disorders in human studies. Caused genetic effects and effects on the immune system in laboratory animal and some human studies. Caused toxicity to the fetus and cancer in laboratory animal studies. CUMENE: Repeated inhalation exposure of cumene vapour produced damage in the kidney of male rats only. These effects are believed to be species specific and are not relevant to humans. ETHANOL: Prolonged or repeated exposure to high concentrations of ethanol vapour or overexposure by ingestion may produce adverse effects to brain, kidney, liver, and reproductive organs, birth defects in offspring, and developmental toxicity in offspring. GASOLINE UNLEADED: Carcinogenic in animal tests. Chronic inhalation studies resulted in liver tumours in female mice and kidney tumours in male rats. Neither result considered significant for human health risk assessment by the United States EPA and others. Did not cause mutations in-vitro or in-vivo. Negative in inhalation developmental studies and reproductive tox studies. Inhalation of high concentrations in animals resulted in reversible central nervous system depression, but no persistent toxic effect on the nervous system. Non-sensitizing in test animals. Caused nerve damage in humans from abusive use (sniffing). METHYL TERTIARY BUTYL ETHER (MTBE): Carcinogenic in animal tests. Inhalation exposure to high concentrations resulted in higher than expected mortality in male mice due to urinary tract obstructions and female mice displayed benign liver tumours. Inhalation exposure to high concentrations resulted in higher than expected mortality in male rats due to progressive kidney damage as well as increased benign and malignant kidney tumours, and benign testicular tumours. Did not cause mutations in-vitro or in-vivo. Rabbits exposed to high vapour concentrations did not have any offspring with adverse developmental effects. Mice exposed to high vapour concentrations (maternally toxic) had offspring with embryo/fetal toxicity and birth defects. Rats exposed to high vapour concentrations did not display any treatment-related effects in a two generation reproduction study.The significance of the animal findings at high exposures are not believed to be directly related to potential human health hazards in the workplace. NAPHTHALENE: Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts. Naphthalene caused cancer in laboratory animal studies, but the relevance of these findings to humans is uncertain.

N-HEXANE: Prolonged and/or repeated exposures to n-Hexane can cause progressive and potentially irreversible damage to the peripheral nervous system (e.g. fingers, feet, arms, legs, etc.). Simultaneous exposure to Methyl Ethyl Ketone (MEK) or Methyl Isobutyl Ketone (MIBK) and n-Hexane can potentiate the risk of adverse effects from n-Hexane on the peripheral nervous system. n-Hexane has been shown to cause testicular damage at high doses in male rats. The relevance of this effect for humans is unknown. TOLUENE : Concentrated, prolonged or deliberate inhalation may cause brain and nervous system damage. Prolonged and repeated exposure of pregnant animals (> 1500 ppm) have been reported to cause adverse fetal developmental effects. ETHYLBENZENE: Caused cancer in laboratory animal studies. The relevance of these findings to humans is uncertain.

XYLENES: High exposures to xylenes in some animal studies have been reported to cause health effects on the developing embryo/fetus. These effects were often at levels toxic to the mother. The significance of these findings to humans has not been determined.

CMR Status:

Chemical Name	CAS Number	List Citations
BENZENE	71-43-2	1, 4, 5
CUMENE	98-82-8	3, 4
CYCLOHEXANE	110-82-7	4
ETHYL ALCOHOL	64-17-5	4
ETHYL BENZENE	100-41-4	3, 4
GASOLINE	86290-81-5	3, 4

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METHYL-TERT-BUTYL ETHER	1634-04-4	4
n-Hexane	110-54-3	4
NAPHTHALENE	91-20-3	3, 4
TOLUENE	108-88-3	4
XYLENES	1330-20-7	4

--REGULATORY LISTS SEARCHED--

1 = IARC 1
2 = IARC 2A
3 = IARC 2B
4 = ACGIH ALL
5 = ACGIH A1
6 = ACGIH A2

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

Less volatile component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Majority of components -- Expected to be inherently biodegradable

Atmospheric Oxidation:

More volatile component -- Expected to degrade rapidly in air

BIOACCUMULATION POTENTIAL

Majority of components -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

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REGULATORY DISPOSAL INFORMATION

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH

SECTION 14 TRANSPORT INFORMATION

LAND (TDG)

Proper Shipping Name: GASOLINE
Hazard Class & Division: 3
UN Number: 1203
Packing Group: II
Marine Pollutant: Yes
Special Provisions: 17

Footnote: Marine Pollutant designation is applicable only if shipped over water.

LAND (DOT)

Proper Shipping Name: GASOLINE
Hazard Class & Division: 3
ID Number: 1203
Packing Group: II
ERG Number: 128
Label(s): 3
Transport Document Name: UN1203, GASOLINE, 3, PG II

SEA (IMDG)

Proper Shipping Name: MOTOR SPIRIT or GASOLINE or PETROL
Hazard Class & Division: 3
EMS Number: F-E, S-E
UN Number: 1203
Packing Group: II
Label(s): 3
Transport Document Name: UN1203, MOTOR SPIRIT or GASOLINE or PETROL, 3, PG II, (-40°C c.c.)

AIR (IATA)

Proper Shipping Name: MOTOR SPIRIT or GASOLINE or PETROL
Hazard Class & Division: 3
UN Number: 1203
Packing Group: II
Label(s) / Mark(s): 3
Transport Document Name: UN1203, GASOLINE, 3, PG II

SECTION 15 REGULATORY INFORMATION

WHMIS Classification: Class B, Division 2: Flammable Liquids Class D, Division 2, Subdivision A: Very Toxic Material

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

CEPA: All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

Listed or exempt from listing/notification on the following chemical inventories: AICS, DSL, ENCS, KECI, PICCS, TSCA

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
BENZENE	71-43-2	6
CUMENE	98-82-8	6
CYCLOHEXANE	110-82-7	6
ETHYL BENZENE	100-41-4	6
METHYL-TERT-BUTYL ETHER	1634-04-4	6
n-Hexane	110-54-3	6
NAPHTHALENE	91-20-3	6
TOLUENE	108-88-3	6
XYLENES	1330-20-7	6

--REGULATORY LISTS SEARCHED--

1 = TSCA 4
2 = TSCA 5a2
3 = TSCA 5e
4 = TSCA 6
5 = TSCA 12b
6 = NPRI

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Revision Changes:
Section 05: Hazardous Combustion Products information was modified.
Section 15: National Chemical Inventory Listing - Header Information was modified.
Composition: Component table information was modified.
Composition: Component table information was modified.
Section 08: Exposure Limits Table information was modified.
SYNONYMS: GASOLINE REGULAR UNLEADED RUL87 DCA DYED, GASOLINE PREMIUM UNLEADED PUL91 DCA, GASOLINE PREMIUM UNLEADED PUL91 LDCA, GASOLINE PREMIUM UNLEADED PUL91 LDCA DYED, ISOOCTANE, AUTOMOTIVE GASOLINE, ESSO SUPREME GASOLINE, GASOLINE REGULAR UNLEADED RUL87 LDCA DYED, ESSO EXTRA GASOLINE, GASOLINE REGULAR UNLEADED RUL87 LDCA, EXXON MIDGRADE GASOLINE, ESSO PREMIUM GASOLINE, ESSO MIDGRADE GASOLINE, ESSO REGULAR GASOLINE, GASOLINE MIDGRADE UNLEADED MUL89 DCA, EXXON REGULAR GASOLINE, GASOLINE MIDGRADE UNLEADED MUL89, EXXON PREMIUM GASOLINE, GASOLINE REGULAR UNLEADED RUL87 DYED, GASOLINE MIDGRADE

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UNLEADED MUL89 DCA DYED, GASOLINE REGULAR UNLEADED RUL87, GASOLINE PREMIUM UNLEADED PUL91, GASOLINE RBOB BLENDSTOCK P91, GASOLINE RBOB BLENDSTOCK R87, GASOLINE MIDGRADE UNLEADED MUL89 LDCA, GASOLINE MIDGRADE UNLEADED MUL89 LDCA DYED, GASOLINE REGULAR UNLEADED RUL87 DCA, GASOLINE PREMIUM UNLEADED PUL91 DCA DYED

PRECAUTIONARY LABEL TEXT:
WHMIS Classification: Class B, Division 2: Flammable Liquids Class D, Division 2, Subdivision A: Very Toxic Material

HEALTH HAZARDS
May cause cancer. Repeated exposure may cause skin dryness or cracking. If swallowed, may be aspirated and cause lung damage. May cause central nervous system depression.

PHYSICAL HAZARDS
FLAMMABLE. Material can accumulate static charges which may cause an ignition. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited.

PRECAUTIONS
Avoid breathing mists or vapour. Avoid all personal contact. Prevent exposure to ignition sources, for example use non-sparking tools and explosion-proof equipment. Potentially toxic/irritating fumes/vapour may be evolved from heated or agitated material. Do not siphon by mouth. Use only with adequate ventilation. Use proper bonding and/or earthing procedures.However, bonding and earthing may not eliminate the hazard from static accumulation.

FIRST AID
Inhalation: Remove from further exposure. For those providing assistance, avoid exposure to yourself or others Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

Eye: Flush thoroughly with water. If irritation occurs, get medical assistance.

Oral: Seek immediate medical attention. Do not induce vomiting.

Skin: Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

FIRE FIGHTING MEDIA
Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

SPILL/LEAK
Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

Water Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface. Seek the advice of a specialist before using dispersants.

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DGN: 5007461 (1006754)

Prepared by: Imperial Oil Limited, IH and Product Safety

Waste Management Plan for the Mackenzie River Ferry Landing Operations

Government of the Northwest Territories – Department of Infrastructure

Government of
Northwest Territories