



REPORT

Spill Contingency Plan

Tuktoyaktuk Base Remediation, Inuvialuit Settlement Region, Northwest Territories

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Inuvialuit Land Administration

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1.0 INTRODUCTION

WSP Canada Inc. (WSP) has prepared this Spill Contingency Plan (the Plan) on behalf of Imperial Oil Resources Limited (Imperial) to support the remediation of the former Tuktoyaktuk Exploration Logistics Base Camp (Tuk Base or the Site) approximately 1.5 kilometres (km) southeast of the Hamlet of Tuktoyaktuk, Northwest Territories (NWT) (Figure 1).

The purpose of this Plan is to describe the appropriate spill prevention measures and responses to several types of spills that may occur during the planned remediation of Tuk Base (the Project).

The Plan will be effective upon its approval and was implemented at the beginning of the 2019 phase of the Project. The Plan will be reviewed yearly and changes will be implemented as required. It includes the Spill Response Contact List for relevant organizations and agencies in the Northwest Territories (NWT) and the reporting requirements in the event of a chemical, fuel or waste spill. Paper copies of this Plan will be available on site through the Site Supervisor and will be posted at several accessible locations. Prior to commencement of the work, the Plan will be distributed to personnel from Imperial, WSP, E. Grubens Transport Ltd. (EGT) and their subcontractors; all personnel will have access to paper and digital copies of the Plan. It will be discussed with the entire crew in daily Health and Safety meetings. Additional copies can be requested through Imperial (Pamela Gyug, pamela.h.gyug@exxonmobil.com).

Project details are provided in the following sections. The Imperial Environment Policy is included in Appendix A.

1.1 Site Location and History

The Site is at 69°25'35"N latitude and 132°57'20"W longitude on the Beaufort Sea coast approximately 1.5 km southeast of Tuktoyaktuk, NWT (Figures 1 and 2). The Site is on a lease (ILA85TJ079) held by Imperial from the Inuvialuit Land Administration (ILA). Tuk Base began operations in 1970 and operated as a staging and storage area for oil and gas exploration in the Arctic. In 1980, decommissioning of the Site began. Between 2001 and 2013 almost all major infrastructure on site was decommissioned and removed (Advisian 2019). As of 2018, the only notable features remaining on site include two historic landfills, a sewage lagoon, north and south docks and concrete pads.

1.2 Site Description

The Site covers a land area of approximately 54 hectares and generally comprises the former Tuk Base on the Upper Terrace, transitioning down to a Lower Terrace (created by infilling the low-lying natural topography with dredged ocean sediments) and the surrounding natural tundra as shown in Figure 2.

The Site is bordered by tundra to the north and south, with the Mayogiak Inlet and Tuktoyaktuk Harbour bordering the Site to the east and west, respectively (Figure 2). The former Northern Transportation Company Limited (NTCL) tank farm/lease is located to the north of the Imperial lease on Saviktok Point.

2.0 PROJECT SUMMARY

The Project-specific Remedial Action Plan (RAP) for the planned remediation works was submitted to the Inuvialuit Water Board (IWB) in March 2019 (Advisian 2019; Golder 2019), approved in July 2019 and amended in May 2020 (Golder 2020). The RAP has been guiding the following Project tasks since 2019 and continuing until 2029.

- Surface debris (including the wood piles from the former wooden wharf) will be collected, removed and disposed of off site at an approved disposal facility.
- Hazardous material (stemming from historical operations) encountered on-site will be temporarily stored, transported off site and disposed of at an approved disposal facility.
- Soil impacted with light-end petroleum hydrocarbons (PHCs) will be treated on-site and used as backfill.
- Soil impacted with heavy-end PHCs will be treated on site and/or disposed of off site at an approved disposal facility.
- Soils impacted with metals or polychlorinated biphenyls will be excavated and transported to an approved disposal facility.
- The Former Sewage Lagoon will be dewatered, backfilled and regraded/revegetated (as directed by the ILA).
- The North Dock will be utilized for the Project and then will either be repurposed (pending negotiations with the ILA) or demolished.
- The South Dock will be demolished.
- The concrete pads will be transported off site for re-use or appropriate disposal.
- Site access for personnel and equipment will be via barge and crew boats from the Hamlet of Tuktoyaktuk during the summer field programs, and ice road during the winter field programs.
- Accommodation during the winter and summer field programs may be provided by the 802-barge camp or the Arctic Star barge camp, anchored either at the Site, or close to Tuktoyaktuk; the location of the camp may change between these two locations seasonally, depending on the number of personnel required for the Site.

After the Project completion, the Site will be left in a condition that promotes long term geotechnical stability and positive drainage in all disturbed areas. The end land use will be “parkland” as defined by the Canadian Council of Ministers of the Environment (CCME; 1999a and updates).

2.1 Contaminated Soil Excavations

Contaminated soil areas that will need to be excavated include the North and South Landfill and multiple locations throughout the former operations area at the Upper Terrace as defined in the RAP (Advisian 2019). Each area will be excavated and, where possible, soil will be treated on site and used as backfill to promote positive drainage. Alternatively, soil that cannot be treated will be transported and disposed of off site at an approved, licenced facility. The disturbed areas will then be revegetated with native species (as directed by the ILA) to match surrounding land cover. The North and South Landfills will be the largest excavations on site.

2.2 North and South Landfills

The North Landfill is north of the lease boundary and contains approximately 2,000 cubic metres (m³) of impacted soil/debris (e.g., construction/demolition debris and general camp debris) that will be excavated, treated and/or removed and disposed of off site. The South Landfill is in the southeast portion of the Upper Terrace (Figure 2). It is considerably larger than the North Landfill and is currently (2025) estimated to contain roughly 18,000 m³ of impacted soil/debris (e.g., drums, domestic debris, rig mats, heavy tangled cables and possible metal decking

materials) that will be excavated, treated and/or removed and disposed of off site. Following confirmatory soil sampling, both landfill excavations will be recontoured to promote positive drainage.

2.2.1 Hazardous Material

Based on the hazardous material survey completed by WorleyParsons (WorleyParsons 2012), most of the hazardous material associated with historic Tuk Base operations was in the historical buildings on site and has since been removed from the Site. Similar to the materials encountered during the 2011 demolition program (WorleyParsons 2013), potentially hazardous waste found within the landfills may include asbestos containing materials (ACMs), polychlorinated biphenyl (PCBs), items painted with PCB amended paint (PAP), items painted with lead-based paint, batteries and waste fuel/oil.

2.2.2 Barrels

As summarized in the RAP (Advisian 2019), previous investigations have identified buried barrels possibly containing product at the South Landfill. The barrel contents were not classified during previous Environmental Site Assessments and will be identified and appropriately disposed of during the Project.

2.3 Draining and Reclamation of Former Sewage Lagoon

The Former Sewage Lagoon water will be sampled for water quality parameters to confirm there are no exceedances of applied guidelines. Upon analytical confirmation, the water will be pumped off to the land at a minimum of 30 metres (m) away from the nearest waterbody and 100 m away from the nearest fish bearing waters. The remaining berms will be used as backfill to re-contour the lagoon area to integrate into the surrounding landscape. The reclaimed lagoon area will then be re-vegetated using a combination of live staking of willows, by harvesting live stakes from the surrounding area, seeding of native species and natural revegetation as approved by the ILA to avoid the establishment of invasive species.

2.4 North and South Docks

Structural assessments of the North and South Docks were completed in 2018 (Advisian 2018) which concluded that the North Dock is in servicable condition while the South Dock was found to be at the end of its servicable life. The North Dock is anticipated to remain intact during the remediation program while the South Dock will be removed. The granular material will be excavated to restore the natural shoreline and then the dock sheet piles will be removed. A Dock Repair and Removal Monitoring Plan was developed to mitigate possible sedimentation effects during South Dock removal (submitted to the IWB in March 2019).

2.5 Concrete Pads

Two concrete pads as well as a number of stockpiled smaller slabs remain on site. These slabs will be excavated and cut to size prior to being removed from Site for reuse or appropriate disposal.

3.0 POTENTIAL SPILLS AND THEIR ENVIRONMENTAL IMPACTS

3.1 Gasoline

Gasoline may be harmful to human health, wildlife and aquatic life. Gasoline is not readily biodegradable and has the potential to bioaccumulate in the environment. Runoff into water bodies will be avoided. Gasoline is highly flammable and quick to volatilize.

Gasoline storage at the Site will be in two double-walled fuel tanks (with a maximum capacity of 2,200 litres [L] each) for refueling of equipment and vehicles (at a minimum 30 m from the nearest identifiable waterbody), with

appropriate secondary containment measures and drip trays/spill kits. The fuel storage tanks may or may not be removed after each field season.

In a worst-case scenario, where the tanks are punctured or opened, contents could overflow and seep through secondary containment into the surrounding terrestrial and aquatic environment. This would involve up to 4,400 L of gasoline. Such an event could cause illness or death to aquatic life and could indirectly affect wildlife feeding from the land and water. Emergency response drills and daily safety meetings will address this scenario.

3.2 Antifreeze-Coolant, Diesel Fuel, Lube Oils and Grease

Diesel, coolant (and potentially large quantities of lube oils and grease) may be harmful to human health, wildlife and aquatic life. Like gasoline, diesel fuel is not readily biodegradable and has the potential to bioaccumulate in the environment. Runoff into bodies of water will be avoided. Unlike gasoline, diesel burns slowly, which reduces the risk to the environment during recovery because a burn can be easier contained.

Diesel storage at the Site will be in a double-walled fuel tank (with a maximum capacity of 100,000 L) for refueling of equipment and vehicles (at a minimum 30 m from the nearest identifiable waterbody), with appropriate secondary containment measures and drip trays/spill kits. The fuel storage tanks may or may not be removed after each field season.

In a worst-case scenario, where the tank is punctured or opened, contents could seep through and overflow secondary containment into the surrounding terrestrial and aquatic environment. This would involve up to 100,000 L of diesel. This scenario could cause illness or death to aquatic life and could indirectly affect wildlife feeding from the land and water. Emergency response drills and daily safety meetings will address this scenario.

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

3.3 Propane

Propane may be harmful to human health, wildlife and to the surrounding environment. Propane is extremely volatile and flammable and will impact human health and the surrounding environment if leaks are not prevented, recognized or stopped.

There will be up to four approximately 2,273 L tanks on the barge camp at any given time. In a worst-case scenario, if all cylinders were punctured or failed and contents leaked into the surrounding environment and ignited, it could possibly lead to an explosion of up to 120 L of propane. The site workers would be at immediate risk and serious environmental impacts could result from this scenario. Emergency response drills and daily safety meetings will address this scenario.

3.4 Sewage

Sewage may be harmful to wildlife and humans as it may cause illness. Three 50,000 L tanks for combined sewage and greywater will be on the support barge adjacent to the barge camp. The support barge will transport sewage for disposal at the Tuktoyaktuk Water Treatment Plant when the sewage tanks are near full capacity, or at the end of each season.

In a worst-case scenario, sewage from the barge camp would enter the ocean. This would involve up to 150,000 L of sewage. This scenario would cause environmental impacts but not result in the endangerment of humans or aquatic life. Emergency response drills and daily safety meetings will address this scenario.

3.5 Hazardous Waste Management

There may be a variety of hazardous waste materials at Tuk Base. As outlined in the Waste Management Plan, hazardous waste will be stored in a safe and secure manner, including the following principles.

- Hazardous waste will be stored and shipped in certified containers for the material type.
- Only properly trained individuals with current Transportation of Dangerous Good (TDG) certification will be collecting and preparing potentially hazardous waste samples for shipment to third-party laboratories off site for analysis and classification.
- Hazardous waste will be stored in a secure area with controlled access. Only persons authorized to enter and trained in waste handling procedures will have access to the storage site.
- Drainage into and from the Site will be controlled to prevent spills or leaks from leaving the Site and to prevent runoff from entering the Site. Any surface water collected within excavations will be sampled to confirm it meets accepted release criteria before release to the environment. While dewatering, excavation measures will be taken to ensure the release does not create soil erosion or enter any existing waterbody. Volumes of released surface water will be tracked and reported in the seasonal execution summary report.
- Regular inspections are performed and recorded. Containers are placed so that each container can be inspected for signs of leaks or deterioration. Leaking or deteriorated containers will be removed, and their contents transferred to a sound container for transportation and off-site disposal.
- Storage sites will use secondary containment and meet the regulatory requirements.

Disposal of all hazardous waste will be off site at a licensed disposal facility.

3.6 Classification of Dangerous Goods

The shipper (consignor) is responsible for classifying all dangerous goods that are shipped, as regulated by the *Transportation of Dangerous Goods (TDG) Act* and Regulations. Goods classified by the manufacturer will be verified by the contractor on site. Where the composition of the products has been changed, (e.g., mixtures of hazardous waste) the products may need to be reclassified.

The carrier is responsible to ensure that the documentation matches the package. All vehicles transporting dangerous goods into or out of the Site will have proper placarding on vehicles. Containers will also be labelled according to the requirements laid out by the *TDG Act* and Regulations.

The site contractor is responsible for completing the shipping document. Persons ordering and receiving dangerous goods will ensure that shipping documents are sent by the suppliers where required by the *TDG Act* and Regulations and will refuse shipments if not in compliance. Documents must be retained for at least two years.

3.7 Fuel Transfer

The following precautions will be implemented during all fuel transfers.

- Fuel transfer will only be completed by experienced personnel.
- All fuel storage and transfer will take place at a designated area, a minimum of 30 m from the high-water mark of any waterbody.
- The fuel transfer procedure consists of using a powered pump nozzle that feeds directly into the equipment's fuel tank. All equipment (nozzles, hoses and joints) will be designed for fuel operations and will be visually inspected before each transfer.
- Spill kits and containments will always be available during fuel transfers.
- Nozzle locks are not permitted, and fuelling will be observed at all times.
- Nozzle is to be kept in upright position unless refuelling and always when reeling or unreeling fuel hose.
- Hoses are to be properly hung or wrapped, and nozzles placed in their holster when not in use.
- A spill containment tray or absorbent pads must be placed under the fuelling point.
- Tanks are not to be filled to capacity, to allow room for expansion.

4.0 SPILL RESPONSE ORGANIZATION

4.1 Regulatory Agencies

The Government of the Northwest Territory's (GNWT's) Departments of Environment and Climate Change (ECC), and the Office of the Regulator of Oil and Gas Operations (OROGO) are responsible for coordinating regulatory oversight and investigation of hazardous material spills in the NWT. Federal agencies (Crown Indigenous Relations and Northern Affairs Canada [CIRNAC], Environment and Climate Change Canada [ECCC] and Transport Canada) are responsible in accordance with their jurisdiction for spill investigations and cleanup monitoring in the NWT. The ILA is responsible for spills on land in the ISR and is the lead regulatory agency for the Tuk Base. The IWB is responsible for regulatory oversight and investigation of discharges to inland waters and the Canadian Coast Guard is the lead response agency overseeing spills from ships and barges.

4.2 Spill Reporting Procedures

The spill response thresholds for a wide variety of materials, compounds and liquids are provided in the Spill Contingency Planning and Reporting Regulations under the NWT *Environmental Protection Act* (1988) and are provided in Appendix B. Additional details are included in Section 9.0.

All spills, regardless of quantity, will be reported to the WSP Site Supervisor, the WSP Safety and Environment Officer, the Imperial Project Manager, the IWB Representative, the ILA and the Northwest Territories/Nunavut (NT/NU) Spill Line where the accidental release:

- is near or into a waterbody;
- is near or into a designated sensitive environment or sensitive wildlife habitat;
- poses an imminent threat to human health or safety; or
- poses an imminent threat to a listed species at risk or its critical habitat.

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

Spill response and reporting procedures will also apply to the accidental release of any untested impounded waters from excavations, even if found to be acceptable for release when tested after the incident.

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

Table A.: Spill Response Contact List

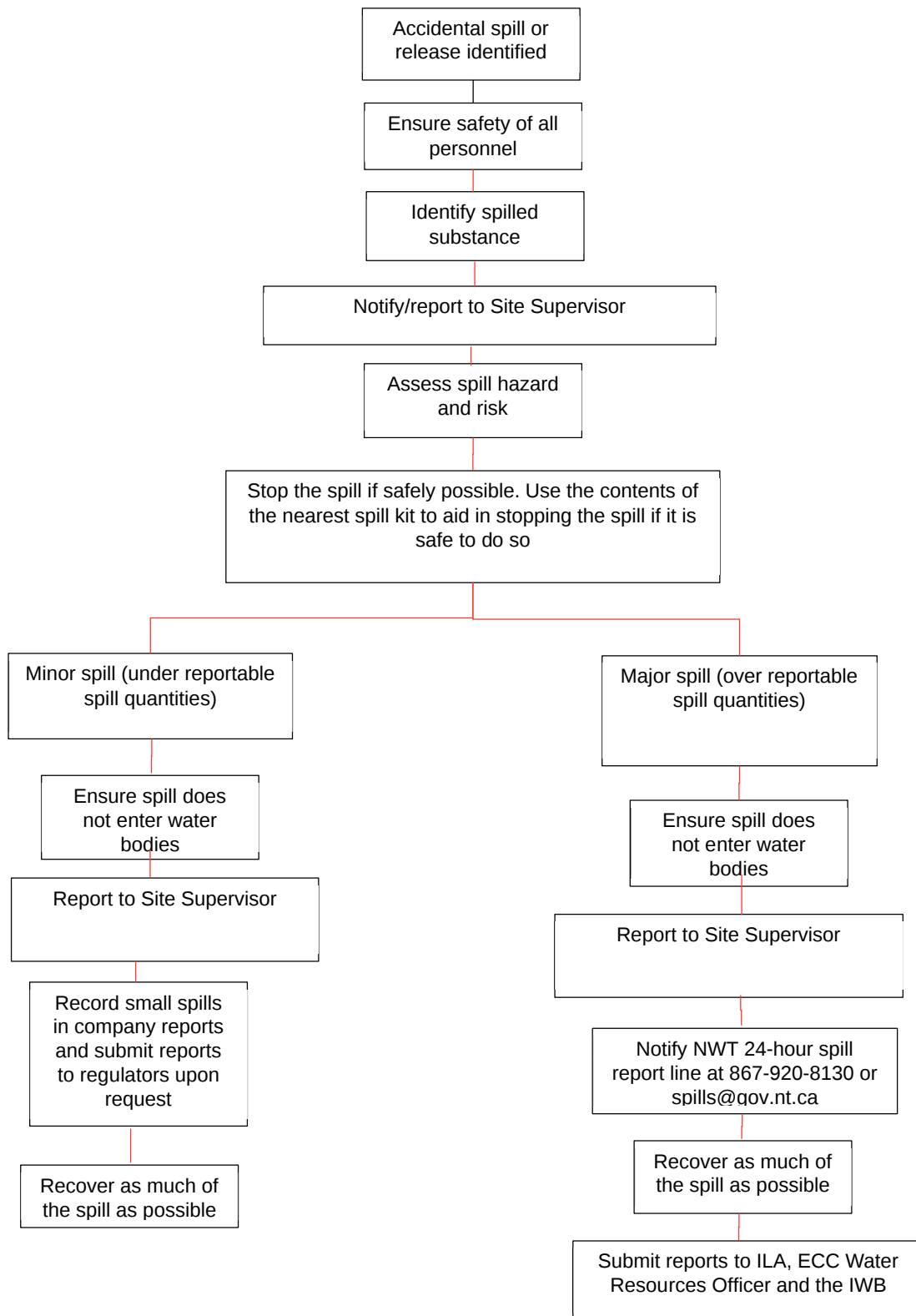
Organization	Contact	Phone Number
Northwest Territories 24-Hour Spill Report Line	n/a	867-920-8130
Inuvialuit Water Board (Executive Director)	Mardy Semmler	867-678-2942
Government of the Northwest Territories Environment and Climate Change, Inuvik (Manager of Resource Management)	Bradley Voudrach	867-678-8090 ext. 24652
Government of the Northwest Territories Environment and Climate Change, Inuvik (Water Resources Officer)	Lloyd Gruben	867-678-8090 ext. 24659
Inuvialuit Land Administration	Chris Gruben	867-777-7057
Canadian Coast Guard 24-hour Spill Reporting Line for Arctic Waters	n/a	1-800-265-0237
WSP Site Supervisor	Todd Bonin	587-439-5244 (mobile)
WSP Project Manager	Virginia Anderson Scott Mclean	250-469-4795 (mobile) 604-679-5538 (mobile)
WSP Environmental Project Manager	Franziska Hawes	604-720-4603 (mobile)
WSP Health and Safety Advisor	Tanya Sullivan	587-701-7323 (mobile)
WSP Project Director	Brian Suen	604-358-5348 (mobile)
Imperial Project Manager	Pamela Gyug	403-801-9861
Imperial Media and Public Enquiries	n/a	587- 476-7010

Note: n/a – not applicable

A variety of communications equipment will be available at the Site for use during the Project. Table B summarizes the communications equipment for both summer and winter components of the Project.

Table B.: Communications Equipment for the Project

Project Component	Company	Equipment (Number)
Summer Field Work	WSP	Satellite phone (1) / cell phones (3) / handheld radios (3)
	EGT and Subcontractors	Cab-mounted radios (3) / cell phones (6) / handheld radios (9)
	Total	Satellite phone (1) / cab-mounted radios (3) cell phones (9) / handheld radios (12)
Winter Site Access / Removal of Waste	WSP	Satellite phone (1) / cell phones (1) / handheld radios (1)
	EGT and Subcontractors	Cab-mounted radios (2) / cell phones (2) / handheld radios (2)
	Total	Satellite phone (1) / cab-mounted radios (2) cell phones (3) / handheld radios (3)

**Figure A: Spill Response Flow Chart**

5.0 PREVENTIVE MEASURES

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

Barrels that may contain product are expected to be uncovered during the excavation of the South Landfill. Intact barrels will be placed in overpacks, and damaged barrels will have their contents drained into new barrels. The barrel contents will be tested, and the barrels will be stored in a secure location using secondary containment and at least 30 m away from the nearest waterbody.

Spill kits will be wherever fuel is stored or used. Refer further to Section 7.1.1 for details on spill kit contents. Portable drip trays and appropriately sized fuel transfer hoses will be used when refueling motorized equipment, to avoid any leaks/drips onto the land. Vehicles will be refueled by filling a fuel truck at the fuel tanks and transporting it to the equipment at the work sites. Established procedures and drip trays will be used during refueling operations to prevent any spills (Section 3.7).

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

6.0 SPILL RESPONSE ACTIONS

The following steps outline the general spill response procedures for initial actions to be taken to contain and clean up a spill, as well as disposing of contaminated materials. Spills on snow, ice or land will spread outward from the initial spill point toward lower-lying areas or spread by wave/wind/current action on water. Penetration downward into snow, ice and soil will also occur at a rate that is dependent on the snow, ice or soil type and the nature of the product spilled and the temperature.

6.1 Initial Spill Response Actions

Initial spill response actions include the following.

- ensure safety of all personnel;
- if needed, evacuate or divert workers from the spill area;
- minimize vehicular traffic as much as possible at the spill site;
- mark, flag and ribbon-off any area that is deemed hazardous to humans or wildlife;
- monitor the air at the perimeter of the flagged off area, as necessary;
- use personal protective equipment (PPE) until concentrations are determined to be within acceptable levels;
- fence off the spill site to prevent wildlife from entering;
- assess spill hazards and risks;
- identify the leak location along with the type of product/material spilled, the duration and the volume released;
- evaluate ground and weather conditions to assess the risk to environment (i.e., rain, gravel, sand, waterbody, muskeg, etc.);

- remove all sources of ignition;
- stop the spill if safely possible (e.g., shut off pump, replace cap, tip drum upwards, patch leaking hole). Use the contents of the nearest spill kit to aid in stopping the spill if it is safe to do so;
- contain the spill by using contents of spill kits. Place sorbent materials on the spill or dig a berm/bell hole to contain the spill; and
- relay information to internal company contacts, government agencies, and if required, the designated communications representative.

6.2 Spill Assessment (Land)

Land spills will spread outward from the initial spill point toward lower-lying areas. Penetration downward into the soil will also occur at a rate that is dependent on the soil type and the nature of the product spilled.

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

- PPE;
- gas detection monitors;
- compass;
- measuring device (i.e., GPS);
- shovel;
- Quantabs or conductivity meter for produced water or emulsion spills;
- hoe, drill or sampling equipment if sub-surface contamination is suspected; and
- camera.

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

Based on the land use in the spilled area, determine the possible public that could be directly impacted; evaluate the Site for wildlife, and determine the approval requirements for accessing the spill site. Reporting details are provided in Section 10. It is important to note the terrain, soil types, characteristics and conditions, as well as the vegetation types on site. Surface run-off patterns, erosion potential, moisture levels and movement of the water table can all impact the severity of the spill and the way in which it can be contained, so it is imperative to take note of all these observations before proceeding with cleanup. Details on site topography are provided in Appendix E. When the previous considerations have been addressed, the next course of action is to determine the equipment resources that are required to control the spill. The initial assessment will impact what equipment will be used, how it will be transported to the spill site and how it will improve or create access to the spill.

6.3 Spill Assessment (Water)

Begin by assessing the characteristics of the affected watercourse including width, depth and velocity. Shoreline characteristics and sensitivities also need to be taken into consideration. The degree of impact, degree of sensitivity (ecological, cultural, human use, etc.) and the physical limitations can all affect the way in which a spill will be contained.

Note that there are limited water bodies at the Site: the Former Sewage Lagoon within the lease area and two small likely man-made ponds (without connection to any watercourse) north of the lease area (Figure 2). Therefore, this section focuses on a spill potentially reaching the harbour.

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

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

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

Containment options for spills on water bodies (i.e., the ocean) may include the use of a containment boom to surround the spill. If the area that may be impinged by the spilled materials is environmentally sensitive, appropriate shoreline protection measure may be implemented as recommended by the Project's Environmental Specialists.

Spills on ice (for example the ice road between the Site and Tuktoyaktuk) will be contained as follows: For small spills, sorbent materials will be used to soak up spilled fuel and shovels will be used to remove soils and other solid waste materials that may have spilled. After the initial cleaning, the remaining contaminated ice and slush will be scraped and shoveled into soil bags or drums. Trucks travelling on the ice road will use tarps to cover their loads to prevent materials from spilling onto the ice.

6.4 First Aid

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

7.0 RESPONSE ACTIONS BY SPILL TYPE

7.1 Chemical Spills

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

7.1.1 Initial Action

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

- evacuate unnecessary personnel;
- ventilate area of leak or spill (opening all doors and windows);
- wear PPE (gloves, safety glasses, impervious material long-sleeved shirt/coat);
- if available, wear respirator/self-contained breathing apparatus (SCBA);
- remove all other chemicals from the area if safe to do so;
- for small spills, dilute with water, mop or wipe up and place in proper container;
- for large spills, contain by diking (soil/dry sand/kitty litter), absorb with inert material (soil/dry sand/kitty litter) and place in chemical waste container;
- after mopping up chemical, wash area well with soap and water, mopping into spill container and not to the ground;
- do not use combustible materials (i.e., sawdust or cardboard);
- contain runoff from spill clean-up; and
- notify the Northwest Territories 24-hour Spill Report Line at (867) 920-8130 to receive disposal information.

7.1.2 Follow-Up Action

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

- dispose of chemical, inert absorbent material, and mop-up water as directed by Spill Report Line personnel and applicable regulators;
- arrange for repair or replacement of chemical containers, pipelines and equipment, if damaged or leaking; and
- submit a detailed report on the occurrence to the applicable regulatory agency within thirty (30) days of reporting the spill event.

7.2 Petroleum Product and Antifreeze Product Spills

Petroleum products have many operational uses, and used petroleum product drums or other containers may be present at the Site. Petroleum product spills may range from minor spills during operations such as refueling, to constant leakage from pipelines in need of repair, to major spills causing large, contaminated soil/water issues.

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

Antifreeze or engine coolant products are used in automotive engines and consist of ethylene glycol or propylene glycol mixed with distilled water. Of the two, propylene glycol is significantly less toxic. Used antifreeze product drums or other containers may cause minor spills to large spills from punctured containers.

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

7.2.1 Initial Action

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

- shut off ignition sources, if safe to do so;
- identify the spilled material and locate the source;
- stop the spill at the source, if safe to do so;
- take actions to contain/clean up spilled material;
- record relevant information for reporting including the quantity of material spilled, product type, location, date, weather, and other relevant information; and
- notify the Northwest Territories 24-Hour Spill Report Line at (867) 920-8130.

7.2.2 Follow-Up Action

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

- collect soil samples for laboratory analysis to determine that spill has been cleaned up;
- dispose of soil in the on-site PHC contaminated soil treatment facility, if appropriate, or off site with the excavated heavy-end PHC contaminated soil and metals contaminated soils;
- arrange for repair or replacement of petroleum product containers, pipelines and equipment, if damaged or leaking;
- submit a detailed report on the occurrence to the relevant regulatory agency within thirty (30) days of reporting the event; and
- for large spills, install wells to monitor groundwater for signs of contamination. Determine the level of final clean-up in consultation with an CIRNAC inspector.

7.3 Sewage

The transfer of the sewage from the barge to the Tuktoyaktuk Water Treatment Plant when nearly full or at the end of each season will be undertaken to prevent spills. In the event of a spill, the area of impact will be minimized and then cleaned up.

7.3.1 Preventive Action

- personnel undertaking sewage transfers will be properly trained and aware of the potential concerns with this activity;
- all hoses and connections will be checked for condition and presence of potential leaks;
- the pump operator will remain at the pump for the duration of the transfer;

- the pump operator will have direct visual contact with the line and the receiving tank or will have constant radio contact with a spotter;
- a spotter will walk the line during the transfer looking for any leaks or signs of potential failure (bulges, etc.);
- if the spotter identifies any concerns, the pump will be shut down and the issue addressed;
- drip trays or secondary containment will be used to prevent drips from entering the environment;
- once transfer is completed, the hoses will be emptied as much as possible. Then they will be carefully removed and handled to keep any remaining contents in the hose; and
- all connections, lids and caps will be made secure.

7.3.2 Initial Action

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

- shut off ignition sources if methane gas is present (when safe to do so);
- identify the spilled material and locate the source;
- stop the spill at the source, if safe to do so;
- take actions to contain/clean up spilled material;
- record relevant information for reporting including the quantity of material spilled, product type, location, date, weather and other relevant information; and
- if spill volume is above the recordable quantity (as per Appendix B; Other Contaminants), notify the Northwest Territories 24-hour Spill Report Line at (867) 920-8130.

7.3.3 Follow-Up Action

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

- dispose of sewage off site in an appropriate manner; and
- submit a detailed report (if required) on the occurrence to the applicable regulatory agency within thirty (30) days of reporting the event.

8.0 RESOURCE INVENTORY

The following section provides the details of the resources that will be available on site to aid in spill response. The procedures for handling, transporting and disposal of spill-related wastes is outlined in Waste Management Plan. The Waste Management Plan will be implemented during all Project activities and its contents will be included in daily Health and Safety meetings with all staff and contractors.

8.1 On-site Resources

Spill kits will be located throughout the Site with contents described below. In addition, earth moving and other equipment is always at the Site to assist with spill response (as listed below). Spill response equipment will be

inside all heavy equipment and vehicles used at the Site. Additional spill response equipment will be at a lay down area next to the temporary fuel storage location.

8.1.1 Spill Kit Contents

- four (4) Tyvek splash suits;
- four (4) pairs of chemical master gloves;
- ten (10) large bags with ties for temporary use;
- two (2) oil only booms (5" x 10');
- fifty (50) oil only mats (16" x 20");
- five (5) sorbent socks;
- ten (10) sorbent pads;
- two (2) large tarps;
- one (1) roll duct tape;
- one (1) utility knife;
- one (1) field notebook and pencil;
- one (1) rake;
- one (1) pick axe;
- three (3) aluminum scoop shovels; and
- one (1) instruction binder.

8.1.2 Equipment Specific to Chemical Spills

A spill kit will be available at the Site to aid in the event of a chemical spill. The kit will include:

- heavy-duty gloves;
- safety glasses;
- mop/wringer/spill squeegee;
- shovel/broom/dustpan;
- chemical spill container with sealable lid; and
- sand/kitty litter (absorbent, non-flammable material).

Alternatively, a 50 Gallon Universal Sorbent Spill Kit can be provided, which includes:

- ten (10) - 3" x 48" socks;
- four (4) - 3" x 10' socks;

- fifty (50) - 15" x 17" pads;
- four (4) pillows;
- fifty (50) wipers;
- five (5) disposal bags and ties;
- five (5) tamperproof seals;
- two (2) pair nitrile gloves; and
- one (1) emergency response guidebook.

8.1.3 Equipment Specific to Fuel Spills

One spill kit will be on-hand at each of the fuel storage areas and in every pick-up truck on site. The kit will include:

- heavy-duty gloves;
- safety glasses;
- mop/wringer/spill squeegee;
- shovel/broom/dustpan;
- chemical spill container with sealable lid; and
- sand/kitty litter (absorbent, non-flammable material).

Alternatively, a 50 Gallon Universal Sorbent Spill Kit can be provided with contents described in Section 7.1.2, above.

8.1.4 Equipment Specific to Sewage Transfer Spills

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

- heavy-duty gloves;
- safety glasses;
- mop/wringer/spill squeegee;
- shovel/broom/dustpan; and
- sand/kitty litter (absorbent, non-flammable material).

Alternatively, a 50 Gallon Universal Sorbent Spill Kit can be provided with contents described in Section 7.1.2, above.

8.1.5 Earth Moving and Other Equipment

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

- three (3) loaders;

- three (3) excavators;
- one (1) dozer;
- two (2) rock trucks;
- one (1) all-terrain vehicle;
- six (6) pick-up trucks;
- fuel transfer hoses with pumps; and
- tool kit including hack saw, hammer, screwdrivers, etc.

9.0 SPILL RESPONSE TRAINING

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

9.1 Orientation

- provide all site personnel with an orientation of the Plan and its applicable elements;
- discuss and clarify bridging between the WSP's emergency response procedures and this Plan where applicable;
- utilize summary wall charts outlining key responsibilities and lines of communication for quick reference purposes; and
- devote a portion of scheduled safety and/or staff meetings to discussion of spill response issues on an on-going basis.

9.2 Specialized Spill Response Training

- make available (through WSP's Safety and Environment Officer) all required training; and
- ensure all personnel comply with the Project's safety training requirements (e.g., First Aid/CPR, Workplace Hazardous Materials Information System [WHMIS], Transportation of Dangerous Goods, Firefighting, etc.).

9.3 Spill Response Drills

WSP will conduct drills on an as needed basis to ensure readiness. If any drills are undertaken, they will be reported as required through the issued permits and licences.

9.4 External Orientation

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

9.5 Training Records

The WSP Safety and Environment Officer will be tracking all training requirements and compliance utilizing a spreadsheet.

10.0 REPORTING REQUIREMENTS

As outlined in Section 4.2, all spills, regardless of quantity, will be reported to the Site Supervisor, the Safety and Environment Officer and the Imperial Project Manager. Spills to be reported include spills that have already occurred, or potential spills that are about to occur. Spills must be reported if the amount is greater than or equal to the amount listed in the spill response thresholds (Appendix B). The spill response thresholds for a wide variety of materials, compounds and liquids are provided by the Spill Contingency Planning and Reporting Regulations under the *Environmental Protection Act* (1988) provided in Appendix B.

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

- date and time of spill;
- location of spill;
- direction spill is moving;
- name and phone number of a contact person close to the location of spill;
- type and quantity of contaminant spilled and cause of spill;
- whether spill is continuing or has been stopped;
- description of existing containment;
- actions taken to contain, recover, clean-up and dispose of the contaminant; and
- name and phone number of the person reporting the spill and the person in charge or control of contaminants at time of spill.

A detailed report on the occurrence must also be submitted within thirty (30) days of the event. An NT/NU Spill Report Form is included at the back of this Plan (Appendix C).

In the very unlikely event that the public may be affected by a spill, the WSP Site Supervisor (or Alternate) will inform Imperial and the Hamlet of Tuktoyaktuk of the nature and size of the spill. The Hamlet will be notified of the clean-up progress and all measures taken to mitigate potential impacts.

11.0 SAFETY DATA SHEETS (SDSs)

SDSs have been provided in Appendix D for the materials outlined in Sections 3. It should be noted that the documents in Appendix D still use the previous name “Material Safety Data Sheets” (MSDS) but are referred to by their current official name (Safety Data Sheets [SDSs]). These SDSs are presented for informational purposes only and should not be used for WHMIS purposes. SDSs from the actual vendors will be acquired and maintained for WHMIS compliance, and if applicable, will replace the sheets in this Plan.

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

12.0 REFERENCES

- Advisian. 2018. Tuk Base Wharf D3 and Small Wharf Level II Condition Assessment. Document Number 407074-00293-MA-REP-0002. Issued 8 November 2018.
- Advisian. 2019. Tuk Base: Remedial Action Plan. Prepared for Imperial. Ref. 407074-00293-701. 19 March 2019.
- CCME (Canadian Council of Ministers of the Environment) 1999a and updates. Canadian Environmental Quality Guidelines: Soil Quality Guidelines for the Protection of Environmental and Human Health.
- Golder (Golder Associates Ltd.). 2019. Re: Remediation Action Plan for Tuk Base. 25 March 2019.
- Golder. 2020. Re: Remediation Action Plan for Tuk Base. 8 May 2020.
- NWT *Environmental Protection Act*. (1988). R.S.N.W.T. 1988, C.E-7.
- WorleyParsons (WorleyParsons Canada Services Ltd.). 2012. Hazardous Materials Survey at Esso Tuk Base, Tuktoyaktuk, Northwest Territories. Prepared for Imperial. 17 July 2012.
- WorleyParsons. 2013. 2011 Tuk Base Demolition, Tuktoyaktuk Base Camp. Prepared for Imperial. 26 July 2013.

Figures



LEGEND

LEASE BOUNDARY

02505001,000

METRES

1:20,000

NOTE(S)
1. ALL UNITS ARE IN METRES UNLESS OTHERWISE NOTED.
2. COORDINATE SYSTEM IS UTM ZONE 8 NAD 83.

REFERENCE(S)
1. BASE MAP: VANTOR

CLIENT

IMPERIAL OIL LIMITED

PROJECT

TUKTOYAKTUK BASE REMEDIATION, INUVIALUIT SETTLEMENT REGION, NORTHWEST TERRITORIES

TITLE

SITE LOCATION

CONSULTANT



YYYY-MM-DD

2026-03-09

DESIGNED

J.REDSTONE

PREPARED

J.REDSTONE

REVIEWED

V.ANDERSON

APPROVED

B.SUEN

PROJECT NO.

CA-GLD-18105460

YEAR/DOC

2026/IWB

REV.

0

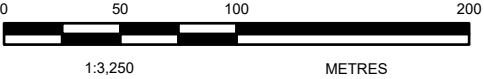
FIGURE

1



LEGEND

— CURRENT ROAD EDGE



NOTE(S)

1. ALL UNITS ARE IN METRES UNLESS OTHERWISE NOTED.

2. COORDINATE SYSTEM IS UTM ZONE 8 NAD 83.

REFERENCE(S)

1. PRE-CONSTRUCTION SURVEY CONDUCTED BY INUKSHUK GEOMATICS INC. DATED: AUGUST 25-29, 2015.

2. RECORD SURVEY CONDUCTED BY INUKSHUK GEOMATICS INC., SUMMARIZING CONSTRUCTION ACTIVITIES UP TO AUGUST 10, 2022. PROVIDED BY GOLDER, RECEIVED: OCTOBER 13, 2022.

3. AERIAL IMAGERY SUPPLIED BY INUKSHUK AND COLLECTED ON AUGUST 26, 2024 BY THE PLEIADES SATELLITE CONSTELLATION.

CLIENT

IMPERIAL OIL LIMITED

PROJECT

TUKTOYAKTUK BASE REMEDIATION, INUVIALUIT SETTLEMENT REGION, NORTHWEST TERRITORIES

TITLE

SITE PLAN

	CONSULTANT	YYYY-MM-DD	2026-03-09
	DESIGNED	J.REDSTONE	
	PREPARED	J.REDSTONE	
	REVIEWED	V.ANDERSON	
	APPROVED	B.SUEN	

PROJECT NO.	YEAR/DOC	REV.	FIGURE
CA-GLD-18105460	2026/IWB	0	2

APPENDIX A

Environment Policy

Environment Policy

It is the policy of Imperial Oil and the ExxonMobil companies in Canada to conduct their business in a manner that is compatible with the balanced environmental and economic needs of the communities in which they operate. The companies are committed to continuous efforts to improve environmental performance throughout their operations.

Accordingly, the companies' policy is to:

- comply with all applicable environmental laws and regulations and apply responsible standards where laws and regulations do not exist
- encourage respect for the environment, emphasize every employee's responsibility in environmental performance, and foster appropriate operating practices and training
- work with government and industry groups to foster timely development of effective environmental laws and regulations based on sound science and considering risks, costs and benefits, including effects on energy and product supply
- manage their business with the goal of preventing incidents and of controlling emissions and wastes to below harmful levels; design, operate, and maintain facilities to this end
- respond quickly and effectively to incidents resulting from their operations, in cooperation with industry organizations and authorized government agencies
- conduct and support research to improve understanding of the impact of their business on the environment, to improve methods of environmental protection, and to enhance their capability to make operations and products compatible with the environment
- communicate with the public on environmental matters and share their experience with others to facilitate improvements in industry performance

- undertake appropriate reviews and evaluations of their operations to measure progress and to foster compliance with this policy.

APPENDIX B

Spill Response Threshold

Appendix B:

Immediately Reportable Spill Quantities

TDG Class	Substance for NWT 24 Hour Spill Line	Immediately Reportable Quantities
1 2.3 2.4 6.2 7 None	Explosives Compressed Gas (Toxic) Compressed Gas (Corrosive) Infectious Substances Radioactive Unknown Substance	Any Amount
2.1 2.2	Compressed gas (flammable) Compressed gas (non-corrosive, non-flammable)	Any amount of gas from containers with a capacity greater than 100 L
3.1 3.2 3.3	Flammable liquids	> 100 L
4.1 4.2 4.3	Flammable solids Spontaneously combustible solids Water reactant	> 25 kg
5.1 9.1	Oxidizing substances Miscellaneous products or substances excluding PCB mixtures	> 50 L or 50 kg
5.2 9.2	Organic peroxides Environmentally hazardous	> 1 L or 1 kg
6.1 8 9.3	Poisonous substances Corrosive substances Dangerous wastes	> 5 L or 5 kg
9.1	PCB mixtures of 5 or more ppm	> 0.5 L or 0.5 kg
None	Other contaminants (e.g. crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, waste water, etc.)	> 100 L or 100 kg
None	Sour natural gas (i.e. contains H ₂ S) Sweet natural gas	Uncontrolled release or sustained flow of 10 minutes or more

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

APPENDIX C

NT/NU Spill Response Form



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR		REPORT TIME		☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER _____-_____
	OCCURRENCE DATE: MONTH – DAY – YEAR		OCCURRENCE TIME			
C	LAND USE PERMIT NUMBER (IF APPLICABLE)			WATER LICENCE NUMBER (IF APPLICABLE)		
	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION				REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE			LONGITUDE		
	DEGREES	MINUTES	SECONDS	DEGREES	MINUTES	SECONDS
F	RESPONSIBLE PARTY OR VESSEL NAME		RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION			
	ANY CONTRACTOR INVOLVED		CONTRACTOR ADDRESS OR OFFICE LOCATION			
H	PRODUCT SPILLED		QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES		U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)		QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES		U.N. NUMBER	
I	SPILL SOURCE		SPILL CAUSE		AREA OF CONTAMINATION IN SQUARE METRES	
	FACTORS AFFECTING SPILL OR RECOVERY		DESCRIBE ANY ASSISTANCE REQUIRED		HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS					
L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE	
	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE	

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLED	REPORT LINE NUMBER
		STATION OPERATOR		YELLOWKNIFE, NT	(867) 920-8130
LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC			SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN		FILE STATUS ☐ OPEN ☐ CLOSED
AGENCY		CONTACT NAME	CONTACT TIME	REMARKS	
LEAD AGENCY					
FIRST SUPPORT AGENCY					
SECOND SUPPORT AGENCY					
THIRD SUPPORT AGENCY					

APPENDIX D

Safety Data Sheets

SAFETY DATA SHEET

GASOLINE, UNLEADED



000003000644

Version 3.1

Revision Date 2021/02/18

Print Date 2021/02/18

SECTION 1. IDENTIFICATION

Product name : GASOLINE, UNLEADED

Synonyms : TN-PE-TM15-X00-1499; LVB87, Regular, Unleaded Gasoline (US Grade), Mid-Grade, Plus, Super, WinterGas, SummerGas, Supreme, SuperClean, SuperClean WinterGas, RegularClean, PlusClean, Premium, marked or dyed gasoline, TQRUL, transitional quality regular unleaded, BOB, Blendstock for Oxygenate Blending, Conventional Gasoline, RUL, MUL, SUL, PUL.

Product code : 100127, 100126, 101823, 100507, 101811, 101814, 100141, 101813, 101810, 101812, 100063, 101822, 100138, 101821, 100064, 101820, 101819, 100506, 101818, 101816, 101817, 100488

Manufacturer or supplier's details
Petro-Canada
P.O. Box 2844, 150 - 6th Avenue South-West
Calgary Alberta T2P 3E3
Canada, Telephone: 1-866-786-2671

Emergency telephone number : CHEMTREC: 1-800-424-9300 (toll free) or +1 703-527-3887; Suncor Energy: +1 403-296-3000

Recommended use of the chemical and restrictions on use

Recommended use : Unleaded gasoline is used in spark ignition engines including motor vehicles, inboard and outboard boat engines, small engines such as chain saws and lawn mowers, and recreational vehicles.

Prepared by : Product Safety

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	Clear liquid.
Colour	Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.
Odour	Gasoline

GHS Classification

Flammable liquids : Category 1

Skin irritation : Category 2

Germ cell mutagenicity : Category 1B

SAFETY DATA SHEET

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Revision Date 2021/02/18

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Carcinogenicity	: Category 1A
Reproductive toxicity	: Category 2
Specific target organ toxicity - single exposure	: Category 3 (Central nervous system)
Specific target organ toxicity - repeated exposure	: Category 1
Aspiration hazard	: Category 1

GHS label elements

Hazard pictograms	:	  
-------------------	---	--

Signal word	: Danger
-------------	----------

Hazard statements	: Extremely flammable liquid and vapour. May be fatal if swallowed and enters airways. Causes skin irritation. May cause drowsiness or dizziness. May cause genetic defects. May cause cancer. Suspected of damaging fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure.
-------------------	--

Precautionary statements	: Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground and bond container and receiving equipment. Use explosion-proof electrical/ ventilating/ lighting equipment. Use non-sparking tools. Take action to prevent static discharges. Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash skin thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves/ protective clothing/ eye protection/ face protection. Response: IF SWALLOWED: Immediately call a POISON CENTER/doctor. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell. IF exposed or concerned: Get medical advice/ attention. Do NOT induce vomiting.
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If skin irritation occurs: Get medical advice/ attention.
Take off contaminated clothing and wash it before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:

Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.

Disposal:

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

Potential Health Effects

Primary Routes of Entry : Eye contact
Ingestion
Inhalation
Skin contact

Aggravated Medical Condition : None known.

Other hazards

None known.

IARC

Group 1: Carcinogenic to humans

Benzene 71-43-2

ACGIH

Confirmed human carcinogen

Benzene 71-43-2

Confirmed animal carcinogen with unknown relevance to humans

Gasoline 86290-81-5

Ethanol 64-17-5

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration
Gasoline; Low boiling point naphtha -unspecified	86290-81-5	95 - 100 %
toluene	108-88-3	1 - 40 %

SAFETY DATA SHEET

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Revision Date 2021/02/18

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benzene	71-43-2	0.5 - 1.5 %
ethanol	64-17-5	0.1 - 0.3 %

All above concentrations are in percent by weight.

SECTION 4. FIRST AID MEASURES

- If inhaled : Move to fresh air.
Artificial respiration and/or oxygen may be necessary.
Seek medical advice.
- In case of skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Wash skin thoroughly with soap and water or use recognized skin cleanser.
Wash clothing before reuse.
Seek medical advice.
- In case of eye contact : Remove contact lenses.
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Obtain medical attention.
- If swallowed : Rinse mouth with water.
DO NOT induce vomiting unless directed to do so by a physician or poison control center.
Never give anything by mouth to an unconscious person.
Seek medical advice.
- Most important symptoms and effects, both acute and delayed : Inhalation may cause central nervous system effects.
Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.
Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.
Chronic exposure to benzene may result in increased risk of leukemia and other blood disorders.
- Notes to physician : Treat symptomatically.
Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Dry chemical
Carbon dioxide (CO₂)
Water fog.
Foam
- Unsuitable extinguishing media : Do NOT use water jet.
- Specific hazards during fire-fighting : Cool closed containers exposed to fire with water spray.
- Hazardous combustion products : Carbon oxides (CO, CO₂), nitrogen oxides (NO_x), polynuclear aromatic hydrocarbons, phenols, aldehydes, ketones, smoke and irritating vapours as products of incomplete combustion.
- Further information : Prevent fire extinguishing water from contaminating surface water or the ground water system.
- Special protective equipment : Wear self-contained breathing apparatus and full protective

SAFETY DATA SHEET

GASOLINE, UNLEADED



000003000644

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for firefighters

wear.

Wear a positive-pressure supplied-air respirator with full face-piece.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

: For personal protection see section 8.
Ensure adequate ventilation.
Evacuate personnel to safe areas.
Material can create slippery conditions.

Environmental precautions

: If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and materials for containment and cleaning up

: Prevent further leakage or spillage if safe to do so.
Remove all sources of ignition.
Soak up with inert absorbent material.
Non-sparking tools should be used.
Ensure adequate ventilation.
Contact the proper local authorities.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling

: For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Use only with adequate ventilation.
In case of insufficient ventilation, wear suitable respiratory equipment.
Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity.
Avoid contact with skin, eyes and clothing.
Do not ingest.
Keep away from heat and sources of ignition.
Keep container closed when not in use.

Conditions for safe storage

: Store in original container.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Keep in a dry, cool and well-ventilated place.
Keep in properly labelled containers.
To maintain product quality, do not store in heat or direct sunlight.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
toluene	108-88-3	TWA	50 ppm 188 mg/m ³	CA AB OEL
		TWA	20 ppm	CA BC OEL

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		TWAEV	50 ppm 188 mg/m3	CA QC OEL
		TWA	20 ppm	ACGIH
benzene	71-43-2	TWA	0.5 ppm 1.6 mg/m3	CA AB OEL
		STEL	2.5 ppm 8 mg/m3	CA AB OEL
		TWA	0.5 ppm	CA BC OEL
		STEL	2.5 ppm	CA BC OEL
		TWA	0.5 ppm	CA ON OEL
		STEL	2.5 ppm	CA ON OEL
		TWAEV	1 ppm 3 mg/m3	CA QC OEL
		STEV	5 ppm 15.5 mg/m3	CA QC OEL
		TWA	0.5 ppm	ACGIH
		STEL	2.5 ppm	ACGIH
Gasoline; Low boiling point naphtha -unspecified	86290-81-5	TWA	300 ppm	CA AB OEL
		STEL	500 ppm	CA AB OEL
		TWA	300 ppm	CA BC OEL
		STEL	500 ppm	CA BC OEL
		TWA	300 ppm	ACGIH
		STEL	500 ppm	ACGIH
ethanol	64-17-5	TWA	1,000 ppm 1,880 mg/m3	CA AB OEL
		STEL	1,000 ppm	CA BC OEL
		TWAEV	1,000 ppm 1,880 mg/m3	CA QC OEL
		STEL	1,000 ppm	ACGIH

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sam-pling time	Permissible concentra-tion	Basis
Toluene	108-88-3	Toluene	In blood	Prior to last shift of work-week	0.02 mg/l	ACGIH BEI
		Toluene	Urine	End of shift (As soon as possible after exposure ceases)	0.03 mg/l	ACGIH BEI

Engineering measures : Adequate ventilation to ensure that Occupational Exposure Limits are not exceeded.
Use only in well-ventilated areas.
Ensure that eyewash station and safety shower are proximal to the work-station location.

Personal protective equipment

Respiratory protection : Concentration in air determines protection needed.

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Filter type	Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. : A NIOSH-approved air-purifying respirator with an organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.
Hand protection Material	: polyvinyl alcohol (PVA), Viton(R). Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.
Remarks	: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Eye protection	: Wear face-shield and protective suit for abnormal processing problems.
Skin and body protection	: Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.
Protective measures Hygiene measures	: Wash contaminated clothing before re-use. : Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash face, hands and any exposed skin thoroughly after handling.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Clear liquid.
Colour	: Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.
Odour	: Gasoline
Odour Threshold	: No data available
pH	: No data available
Melting point	: No data available
Boiling point/boiling range	: 25 - 225 °C (77 - 437 °F)

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Decomposition temperature	No data available
Flash point	: -50 - -38 °C (-58 - -36 °F) Method: Tagliabue.
Auto-Ignition Temperature	: 257 °C (495 °F)
Evaporation rate	: No data available
Flammability	: Extremely flammable in presence of open flames, sparks, shocks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapour may generate static charge causing ignition. May accumulate in confined spaces.
Upper explosion limit	: 7.6 %(V)
Lower explosion limit	: 1.3 %(V)
Vapour pressure	: < 802.5 mmHg (20 °C / 68 °F)
Relative vapour density	: 3
Relative density	: 0.685 - 0.8
Solubility(ies)	
Water solubility	: insoluble
Partition coefficient: n-octanol/water	: No data available
Viscosity	
Viscosity, kinematic	: No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No dangerous reaction known under conditions of normal use.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Hazardous polymerisation does not occur.
Conditions to avoid	: Extremes of temperature and direct sunlight.
Incompatible materials	: Reactive with oxidising agents, acids and interhalogens.
Hazardous decomposition products	: May release COx, NOx, phenols, polycyclic aromatic hydrocarbons, aldehydes, ketones, smoke and irritating vapours when heated to decomposition.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Eye contact
Ingestion

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Inhalation
Skin contact

Acute toxicity

Product:

- Acute oral toxicity : Remarks: Based on available data, the classification criteria are not met.
- Acute inhalation toxicity : Remarks: Based on available data, the classification criteria are not met.
- Acute dermal toxicity : Remarks: Based on available data, the classification criteria are not met.

Components:

Gasoline; Low boiling point naphtha -unspecified:

- Acute oral toxicity : LD50 (Rat): 13,600 mg/kg,
- Acute dermal toxicity : LD50 (Rabbit): > 3,750 mg/kg,

toluene:

- Acute oral toxicity : LD50 (Rat): 5,580 mg/kg,
- Acute inhalation toxicity : LC50 (Rat): > 20 mg/l
Exposure time: 4 h
Test atmosphere: vapour
- Acute dermal toxicity : LD50 (Rabbit): 12,125 mg/kg,

benzene:

- Acute oral toxicity : LD50 (Rat): 2,990 mg/kg,
- Acute inhalation toxicity : LC50 (Rat): 13700 ppm
Exposure time: 4 h
Test atmosphere: vapour
- Acute dermal toxicity : LD50 (Rabbit): > 8,240 mg/kg,

ethanol:

- Acute oral toxicity : LD50 (Rat): 7,060 mg/kg,
- Acute inhalation toxicity : LC50 (Rat): > 32380 ppm
Exposure time: 4 h
Test atmosphere: vapour

Skin corrosion/irritation

Product:

Remarks: Causes skin irritation.

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Serious eye damage/eye irritation

Product:

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

Respiratory or skin sensitisation

Product:

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

Germ cell mutagenicity

Product:

Germ cell mutagenicity-
Assessment

May cause genetic defects.

Carcinogenicity

Product:

Carcinogenicity - As-
sessment

May cause cancer.

Reproductive toxicity

Product:

Reproductive toxicity -
Assessment

Suspected of damaging fertility or the unborn child.

STOT - single exposure

Product:

Remarks: May cause drowsiness or dizziness.

STOT - repeated exposure

Product:

Remarks: Causes damage to organs through prolonged or repeated exposure.

No data available

Aspiration toxicity

Product:

May be fatal if swallowed and enters airways.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish

:

Remarks: No data available

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Toxicity to daphnia and other aquatic invertebrates : Remarks: No data available

Toxicity to algae : Remarks: No data available

Toxicity to bacteria : Remarks: No data available

Persistence and degradability

Product:

Biodegradability : Remarks: No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : The product should not be allowed to enter drains, water courses or the soil.
Offer surplus and non-recyclable solutions to a licensed disposal company.
Waste must be classified and labelled prior to recycling or disposal.
Send to a licensed waste management company.
Dispose of as hazardous waste in compliance with local and national regulations.
Dispose of product residue in accordance with the instructions of the person responsible for waste disposal.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No. : UN 1203
Proper shipping name : Gasoline
Class : 3
Packing group : II
Labels : Class 3 - Flammable Liquid
Packing instruction (cargo aircraft) : 364

IMDG-Code

UN number : UN 1203
Proper shipping name : GASOLINE

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Class	: 3
Packing group	: II
Labels	: 3
EmS Code	: F-E, S-E
Marine pollutant	: no

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

National Regulations

TDG

UN number	: UN 1203
Proper shipping name	: GASOLINE
Class	: 3
Packing group	: II
Labels	: 3
ERG Code	: 128
Marine pollutant	: no

SECTION 15. REGULATORY INFORMATION

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

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

DSL	On the inventory, or in compliance with the inventory
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SECTION 16. OTHER INFORMATION

For Copy of SDS	: Internet: www.petro-canada.ca/msds Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228 For Product Safety Information: 1 905-804-4752
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Prepared by	: Product Safety
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Revision Date	: 2021/02/18
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The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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DIESEL FUEL

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SECTION 1. IDENTIFICATION

Product name : DIESEL FUEL

Synonyms : Seasonal Diesel, #2 Diesel, #1 Diesel, #2 Heating Oil, #1 Heating Oil, OSX, D50, Arctic Diesel, Farm Diesel, Marine Diesel, Low Sulphur Diesel, LSD, Ultra Low Sulphur Diesel, ULSD, Mining Diesel, Naval Distillate, Dyed Diesel, Marked Diesel, Coloured Diesel, Furnace special, Biodiesel blend, B1, B2, B5, Renewable Diesel blend (RX where X is 2- 50, X is representative of volume %), Diesel Low Cloud (LC), Marine Gas Oil, Marine Gas Oil Dyed

Product code : 103213, 100679, 100654, 100653, 100105, 100992, 100637, 100634, 100631, 100638, 100641, 100635, 100632, 100684, 100683, 100657, 100656, 100655, 100687, 100686, 100685, 100681, 100661, 100659, 100667, 100666, 100665, 100682, 100671, 100669, 100664, 100662, 100680, 100781, 100964, 103204, 103180, 103179, 103193, 103178, 103136, 103135, 103134, 103133, 103132, 103131, 101799, 102907, 102762, 102763, 102755, 102302, 102744, 101801, 100678, 100677, 101802, 100107, 100668, 100658, 100911, 100663, 100652, 100460, 100065, 101796, 101793, 101795, 101792, 101794, 101791, 100768, 100643, 100642, 100103, 101798, 101800, 101797, 101788, 101789, 101787, 102531, 100734, 100733, 100640, 100997, 100995, 100732, 100731, 100994

Manufacturer or supplier's details
Petro-Canada
P.O. Box 2844, 150 - 6th Avenue South-West
Calgary Alberta T2P 3E3
Canada, Telephone: 1-866-786-2671

Emergency telephone number : CHEMTREC: 1-800-424-9300 (toll free) or +1 703-527-3887;
Suncor Energy: +1 403-296-3000

Recommended use of the chemical and restrictions on use

Recommended use : Diesel fuels are distillate fuels suitable for use in high and medium speed internal combustion engines of the compression ignition type. Mining diesels, marine diesels, MDO and naval distillates may have a higher flash point requirement.

Prepared by : Product Safety

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	Bright oily liquid.
Colour	Clear to yellow (This product may be dyed red for taxation purposes)

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Odour	Mild petroleum oil like.
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GHS Classification

Flammable liquids	: Category 3
Acute toxicity (Inhalation)	: Category 4
Skin irritation	: Category 2
Carcinogenicity	: Category 2
Specific target organ toxicity - single exposure	: Category 3 (Central nervous system)
Specific target organ toxicity - repeated exposure	: Category 2 (Liver, thymus, Bone)
Aspiration hazard	: Category 1

GHS label elements

Hazard pictograms	:	  
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Signal word	: Danger
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Hazard statements	: Flammable liquid and vapour. May be fatal if swallowed and enters airways. Causes skin irritation. Harmful if inhaled. May cause drowsiness or dizziness. Suspected of causing cancer. May cause damage to organs (Liver, thymus, Bone) through prolonged or repeated exposure.
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Precautionary statements	: Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground and bond container and receiving equipment. Use explosion-proof electrical/ ventilating/ lighting equipment. Use non-sparking tools. Take action to prevent static discharges. Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash skin thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/ protective clothing/ eye protection/ face protection. Response:
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IF SWALLOWED: Immediately call a POISON CENTER/doctor.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
IF exposed or concerned: Get medical advice/ attention.
Do NOT induce vomiting.
If skin irritation occurs: Get medical advice/ attention.
Take off contaminated clothing and wash it before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:

Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.

Disposal:

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

Potential Health Effects

Primary Routes of Entry : Eye contact
Ingestion
Inhalation
Skin contact

Aggravated Medical Condition : None known.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration
Kerosine (petroleum), hydrodesulfurized; Kerosine — unspecified	64742-81-0	48 - 100 %
Kerosine (petroleum); Straight run kerosine	8008-20-6	
Fuels, diesel; Gasoil — unspecified	68334-30-5	
Alkanes, C10-20-branched and linear	928771-01-1	0 - 50 %
Fatty acids, C16-18 and C18-unsatd., Me esters	67762-38-3	0 - 20 %

All above concentrations are in percent by weight.

SECTION 4. FIRST AID MEASURES

If inhaled : Move to fresh air.
Artificial respiration and/or oxygen may be necessary.
Seek medical advice.

In case of skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing

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	and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Wash clothing before reuse. Seek medical advice.
In case of eye contact	: Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.
If swallowed	: Rinse mouth with water. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Seek medical advice.
Most important symptoms and effects, both acute and delayed	: Harmful if inhaled. Respiratory, skin and eye irritation; nausea; cancer.
Notes to physician	: Treat symptomatically. For specialist advice physicians should contact the Poisons Information Service.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	: Dry chemical Carbon dioxide (CO ₂) Water fog. Foam
Unsuitable extinguishing media	: Do NOT use water jet.
Specific hazards during fire-fighting	: Cool closed containers exposed to fire with water spray.
Hazardous combustion products	: Carbon oxides (CO, CO ₂), nitrogen oxides (NO _x), sulphur oxides (SO _x), smoke and irritating vapours as products of incomplete combustion.
Further information	: Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for firefighters	: Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	: For personal protection see section 8. Ensure adequate ventilation. Evacuate personnel to safe areas. Material can create slippery conditions.
Environmental precautions	: If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	: Prevent further leakage or spillage if safe to do so. Remove all sources of ignition. Soak up with inert absorbent material. Non-sparking tools should be used. Ensure adequate ventilation.

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Contact the proper local authorities.

SECTION 7. HANDLING AND STORAGE

- Advice on safe handling : For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Use only with adequate ventilation.
In case of insufficient ventilation, wear suitable respiratory equipment.
Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity.
Avoid contact with skin, eyes and clothing.
Do not ingest.
Keep away from heat and sources of ignition.
Keep container closed when not in use.
- Conditions for safe storage : Store in original container.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Keep in a dry, cool and well-ventilated place.
Keep in properly labelled containers.
To maintain product quality, do not store in heat or direct sunlight.
Ensure the storage containers are grounded/bonded.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Kerosine (petroleum), hydrodesulfurized; Kerosine — unspecified	64742-81-0	TWA	200 mg/m ³ (As total hydrocarbon vapour)	ACGIH
		TWA	200 mg/m ³ (total hydrocarbon vapor)	CA AB OEL
		TWA	525 mg/m ³	CA ON OEL
		TWA	200 mg/m ³ (As total hydrocarbon vapour)	ACGIH
		TWA	200 mg/m ³ (total hydrocarbon vapor)	ACGIH
Kerosine (petroleum); Straight run kerosine	8008-20-6	TWA	200 mg/m ³ (total hydrocarbon vapor)	CA BC OEL
		TWA	200 mg/m ³ (total hydrocarbon vapor)	CA AB OEL
		TWA	200 mg/m ³ (total hydrocarbon	ACGIH

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			vapor)	
Fuels, diesel; Gasoil — unspecified	68334-30-5	TWA	100 mg/m ³ (total hydrocarbons)	CA AB OEL
		TWA (Vapour and inhalable aerosols)	100 mg/m ³ (total hydrocarbons)	CA BC OEL
		TWA (Inhalable fraction and vapor)	100 mg/m ³ (total hydrocarbons)	ACGIH

Engineering measures : Adequate ventilation to ensure that Occupational Exposure Limits are not exceeded.
Use only in well-ventilated areas.
Ensure that eyewash station and safety shower are proximal to the work-station location.

Personal protective equipment

Respiratory protection : Concentration in air determines protection needed.
Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Filter type : organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection
Material : neoprene, nitrile, polyvinyl alcohol (PVA), Viton(R). Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.

Remarks : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eye protection : Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.

Protective measures : Wash contaminated clothing before re-use.

Hygiene measures : Remove and wash contaminated clothing and gloves, including the inside, before re-use.

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Wash face, hands and any exposed skin thoroughly after handling.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Bright oily liquid.
Colour	: Clear to yellow (This product may be dyed red for taxation purposes)
Odour	: Mild petroleum oil like.
Odour Threshold	: No data available
pH	: No data available
Melting point	: No data available
Boiling point/boiling range	: 150 - 371 °C (302 - 700 °F)
Decomposition temperature	No data available
Flash point	: > 40 °C (104 °F) Method: closed cup
Auto-Ignition Temperature	: 204 °C (399 °F)
Evaporation rate	: No data available
Flammability	: Flammable in presence of open flames, sparks and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. This product can accumulate static charge and ignite.
Upper explosion limit	: 6 %(V)
Lower explosion limit	: 0.7 %(V)
Vapour pressure	: 7.5 mmHg (20 °C / 68 °F)
Relative vapour density	: 4.5
Relative density	: 0.8 - 0.88
Solubility(ies)	
Water solubility	: insoluble
Partition coefficient: n-octanol/water	: No data available
Viscosity	
Viscosity, kinematic	: 1.3 - 4.1 cSt (40 °C / 104 °F)

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SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Stable at normal ambient temperature and pressure.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Hazardous polymerisation does not occur.
Conditions to avoid	: Extremes of temperature and direct sunlight.
Incompatible materials	: Reactive with oxidising agents and acids.
Hazardous decomposition products	: May release COx, NOx, SOx, smoke and irritating vapours when heated to decomposition.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Eye contact
Ingestion
Inhalation
Skin contact

Acute toxicity

Product:

Acute oral toxicity	: Remarks: Based on available data, the classification criteria are not met.
Acute inhalation toxicity	: Acute toxicity estimate: 1.5 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method Assessment: The component/mixture is moderately toxic after short term inhalation. Remarks: Harmful if inhaled.
Acute dermal toxicity	: Assessment: The substance or mixture has no acute dermal toxicity

Components:

Kerosine (petroleum), hydrodesulfurized; Kerosine — unspecified:

Acute oral toxicity	: LD50 (Rat): > 5,000 mg/kg,
Acute inhalation toxicity	: LC50 (Rat): > 5.2 mg/l Exposure time: 4 hrs Test atmosphere: dust/mist
Acute dermal toxicity	: LD50 (Rabbit): > 2,000 mg/kg,

Kerosine (petroleum); Straight run kerosine:

Acute oral toxicity	: LD50 (Rat): > 5,000 mg/kg,
Acute inhalation toxicity	: LC50 (Rat): > 5 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	: LD50 (Rabbit): > 2,000 mg/kg,

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Fuels, diesel; Gasoil — unspecified:

Acute oral toxicity : LD50 (Rat): 7,500 mg/kg,
Acute inhalation toxicity : LC50 (Rat): 4.1 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Acute dermal toxicity : LD50 (Mouse): 24,500 mg/kg,

Skin corrosion/irritation

Product:

Remarks: Causes skin irritation.

Serious eye damage/eye irritation

Product:

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

Respiratory or skin sensitisation

Product:

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

Germ cell mutagenicity

Product:

Germ cell mutagenicity- Assessment	Based on available data, the classification criteria are not met.
---------------------------------------	---

Carcinogenicity

Product:

Carcinogenicity - As- essment	Suspected of causing cancer.
----------------------------------	------------------------------

Reproductive toxicity

Product:

Reproductive toxicity - Assessment	Based on available data, the classification criteria are not met.
---------------------------------------	---

STOT - single exposure

Product:

Target Organs: Central nervous system
Remarks: May cause drowsiness or dizziness.

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Print Date 2022/02/01

STOT - repeated exposure

Product:

Target Organs: Liver, thymus, Bone

Remarks: May cause damage to organs through prolonged or repeated exposure.

No data available

Aspiration toxicity

Product:

May be fatal if swallowed and enters airways.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish :
Remarks: No data available

Toxicity to daphnia and other :
aquatic invertebrates Remarks: No data available

Toxicity to algae :
Remarks: No data available

Toxicity to bacteria : Remarks: No data available

Persistence and degradability

Product:

Biodegradability : Remarks: No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : The product should not be allowed to enter drains, water courses or the soil.
Offer surplus and non-recyclable solutions to a licensed disposal company.
Waste must be classified and labelled prior to recycling or disposal.
Send to a licensed waste management company.

SAFETY DATA SHEET

DIESEL FUEL

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Revision Date 2022/02/01

Print Date 2022/02/01

Contaminated packaging : Dispose of as hazardous waste in compliance with local and national regulations.
Dispose of product residue in accordance with the instructions of the person responsible for waste disposal.
: Contact local or business unit authorities for guidance on disposal of product.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No. : UN 1202
Proper shipping name : Diesel fuel
Class : 3
Packing group : III
Labels : Class 3 - Flammable Liquid
Packing instruction (cargo aircraft) : 366

IMDG-Code

UN number : UN 1202
Proper shipping name : DIESEL FUEL
Class : 3
Packing group : III
Labels : 3
EmS Code : F-E, S-E
Marine pollutant : yes

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

National Regulations

TDG

UN number : UN 1202
Proper shipping name : DIESEL FUEL
Class : 3
Packing group : III
Labels : 3
ERG Code : 128
Marine pollutant : yes

SECTION 15. REGULATORY INFORMATION

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

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

DSL On the inventory, or in compliance with the inventory

SAFETY DATA SHEET

DIESEL FUEL

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Revision Date 2022/02/01

Print Date 2022/02/01

SECTION 16. OTHER INFORMATION

For Copy of SDS : Internet: www.petro-canada.ca/msds
Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228
For Product Safety Information: 1 905-804-4752

Prepared by : Product Safety

Revision Date : 2022/02/01

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



MATERIAL SAFETY DATA SHEET PACKET

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

SRM Number: 1866b
SRM Name: Common Commercial
Asbestos

Date of Issue: 09 January 2007

MSDS Coordinator: Mario Cellarosi
Telephone: 301-975-6776
FAX: 301-926-4751
E-mail: SRMMSDS@nist.gov

Emergency Telephone Chem Trec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

Description: Standard Reference Material (SRM) 1866b is comprised of three commercial-grade asbestos materials that were, or are, commonly used in commerce. These asbestos materials are typical of the asbestos found in bulk samples during routine asbestos inspections of building materials. The optical properties serve as a primary calibration standard in the identification of asbestos with polarized light microscopy (PLM). A unit of SRM 1866b consists of a set of three bottles: one bottle containing chrysotile, one bottle containing asbestiform grunerite (amosite), and one bottle containing asbestiform riebeckite (crocidolite). Each bottle contains between 1 gram and 3 grams of material.

Chrysotile

Asbestiform Grunerite (Amosite)

Asbestiform Riebeckite (Crocidolite)

An MSDS is provided for each of the three asbestos materials listed above, which contain hazardous components 1 % or greater and/or carcinogens 0.1 % or greater, in compliance with OSHA 29 CFR 1910.1200.

MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

SRM Number: 1866b
MSDS Number: 1866b
SRM Name: Common Commercial Asbestos

Date of Issue: 09 January 2007

MSDS Coordinator: Mario Cellarosi
Telephone: 301-975-6776
FAX: 301-926-4751
E-mail: SRMMSDS@nist.gov

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

Description: Standard Reference Material (SRM) 1866b is a set of three individual commercial-grade asbestos materials: **chrysotile**, asbestiform grunerite (amosite), and asbestiform riebeckite (crocidolite). A unit of SRM 1866b consists of three bottles, each containing between 1 gram and 3 grams of individual material.

Substance: Chrysotile

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS^(a)

Component:	Chrysotile
Other Designations:	Chrysotile (metaxite; serpentine chrysotile; asbestos; chrysotile asbestos)
CAS Number:	12001-29-5
EC Number (EINECS):	Not assigned.
SRM Nominal Concentration (% by weight or volume):	> 90
Component:	Magnetite (as an impurity)
Other Designation:	Magnetite (magnetic iron oxide; black iron oxide; magnetic iron ore; lodestone; black ferric oxide)
CAS Number:	1309-38-2
EC Number (EINECS):	215-169-8
SRM Nominal Concentration (% by weight):	< 5
EC Classification:	T Carcinogen Category 1
EC Risk (R No.):	23, 45, 48
EC Safety (S No.):	45, 53

^(a) Hazardous components 1 % or greater; carcinogens 0.1 % or greater are listed in compliance with OSHA 29 CFR 1910.1200.

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0–4): Health = 1 Fire = 0 Reactivity = 0

Major Health Hazards: Cancer hazard (in humans)

Potential Health Effects

Inhalation: Inhalation of chrysotile asbestos dust may be irritating. Symptoms include a cough and chest pain. Chronic exposure may cause asbestosis, interstitial fibrosis of the lung tissue, which may develop within 4 years to 9 years, but onset may be typically delayed 20 years to 40 years after first exposure. Death from asbestosis may be due to respiratory or cardiac failure. Secondary lung infections may also occur. Chronic exposure of asbestos to workers may also cause pleural effusion as early as 3 years to 4 years after initial exposure. Chronic exposure of asbestos to workers also increases the chance of pleural and peritoneal mesotheliomas, bronchogenic carcinoma, lung cancer, and cancers of the gastrointestinal tract and larynx. The latent period for mesothelioma is 3 years to 40 years; for lung cancer, 15 years to 30 years.

Skin Contact: Direct contact may cause irritation. Asbestos fibers may penetrate the skin and result in "asbestos corns", due to thickening of the skin around the implanted fiber. These corns usually occur on the hands and forearms, and they disappear on removal of the fibers.

Eye Contact: Direct contact may cause irritation with redness due to mechanical action.

Ingestion: Acute exposure by cause gastrointestinal irritation. Chronic exposure of asbestos fibers may be involved in cancers of the buccal cavity and pharynx, esophagus, stomach, colon, and rectum.

**Listed as a Carcinogen/
Potential Carcinogen:**

Yes No

X _____

In the National Toxicology Program (NTP) Report on Carcinogens.

X _____

In the International Agency for Research on Cancer (IARC) Monographs.

X _____

By the Occupational Safety and Health Administration (OSHA).

4. FIRST AID MEASURES

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration by qualified personnel. Get immediate medical attention.

Skin Contact: Rinse affected area with copious amounts of water followed by washing with soap and water for at least 15 minutes while removing contaminated clothing. Get immediate medical attention.

Eye Contact: Flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Get immediate medical attention.

Ingestion: If a large amount is swallowed, get immediate medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Chrysotile is a negligible fire hazard.

Extinguishing Media: Regular dry chemical. Carbon dioxide. Water. Regular foam.

Fire Fighting: If material is involved in a fire, extinguish fire with a medium appropriate for the surrounding fire. Material itself does NOT burn or burns with difficulty. Keep run-off water out of sewers and water sources. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Component: Chrysotile

Flash Point: Not applicable.

Method Used: Not applicable.

Autoignition Temp.: Not applicable.

Flammability Limits in Air

UPPER (Volume %): Not applicable.

LOWER (Volume %): Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Do NOT touch or walk through spilled material. Avoid inhalation of asbestos dust (see Section 8, "Exposure Controls and Personal Protection"). Collect small dry spills with a shovel and place material into an appropriate container for disposal. Prevent entry into waterways and sewers. Clean up residue with a HEPA filter vacuum.

Disposal: Refer to Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

Storage: Store and handle in accordance with all current regulations and standards.

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection".

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:	Chrysotile OSHA (PEL): 0.1 fibers/cc TWA ACGIH (TLV): 0.1 fibers/cc TWA NIOSH: 0.1 fibers/cc recommended TWA (10 h)
Ventilation:	Provide local exhaust ventilation system equipped with a HEPA-filter dust collection system.
Respirator:	If workplace conditions warrant a respirator's use, a NIOSH/MSHA approved respirator should be used under an implemented respiratory protection program in accordance with OSHA Standard 29 CFR 1910.134 (General Industry, Use of Respirators) and 29 CFR 1910.1001 for occupational exposure to asbestos.
Eye Protection:	Wear safety goggles. An eye wash station should be readily available near areas of use.
Personal Protection:	Wear appropriate protective clothing and gloves to prevent skin exposure. Refer to OSHA Regulated Substances: OSHA 29 CFR 1910.1001.

9. PHYSICAL AND CHEMICAL PROPERTIES

Component:	Chrysotile
Appearance:	Fibrous solid to dust-like powder. White to grey-brown. Odorless.
Relative Molecular Mass:	Not applicable.
Molecular Formula:	$\text{Mg}_3(\text{Si}_2\text{O}_5)(\text{OH})_4$
Water Solubility:	Insoluble.
Solvent Solubility:	Insoluble in organic solvents.

10. STABILITY AND REACTIVITY

Stability:	<u> X </u> Stable <u> </u> Unstable Stable at normal temperatures and pressure.
Conditions to Avoid:	Avoid generating dust. Keep out of water supplies and sewers.
Incompatible Materials:	May be attacked by strong acids.
Fire/Explosion Information:	See Section 5, "Fire Fighting Measures".
Hazardous Decomposition:	Completely decomposes at temperatures of 1 000 °C.
Hazardous Polymerization:	<u> </u> Will Occur <u> X </u> Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry:	<u> X </u> Inhalation <u> X </u> Skin <u> X </u> Ingestion
Toxicity Data:	Chrysotile Human, Inhalation TCL_0 : 2.8 fibers/cc (5 years) Rat, Inhalation-Intermittent TCL_0 : 8 210 $\mu\text{g}/\text{m}^3$ (6 h to 20 d) Rat, Oral-Continuous TDL_0 : 10 867 mg/kg (78 weeks)
Tumorigenic, Reproductive, Mutagenic Data:	Chrysotile has been investigated as a tumorigenic and mutagenic effector.
Health Effects (Acute and Chronic):	See Section 3: "Hazards Identification" for potential health effects.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:	Not available.
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13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Asbestos; UN2212; Hazard Class 9
NOTE: This material, as packaged for SRM 1866b, is not subject to the regulations per DOT Special Provision 156 and IATA special Provision A61.

15. REGULATORY INFORMATION

U.S. Regulations: CERCLA Sections 102a/103 (40 CFR 302.4): Asbestos: 1 lbs RQ
SARA Title III Section 302 (40 CFR 355.30): Not regulated.
SARA Title III Section 304 (40 CFR 355.40): Not regulated.
SARA Title III Section 313 (40 CFR 372.65): Asbestos.
OSHA Process Safety (29 CFR 1910.119): Not regulated.
SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE: No.
CHRONIC: Yes.
FIRE: No.
REACTIVE: No.
SUDDEN RELEASE: No.

State Regulations: California Proposition 65: Asbestos is known to the state of California to cause cancer (Feb. 17, 1987).

CANADIAN Regulations

WHMIS Classification: Not determined for this material.

EUROPEAN Regulations

EC Classification (assigned): T Toxic.
Carcinogen Category 1.

EC Risk Phrases: R45 May cause cancer.
R23/48 Toxic: danger of serious damage to health by prolonged exposure through inhalation.

EC Safety Phrases: S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S53 Avoid exposure.

National Inventory Status

U.S. Inventory (TSCA): Asbestos: Not listed on inventory.

TSCA 12(b)

Export Notification: Asbestos: CAS No.: 1332-21-4
Section 6

16. OTHER INFORMATION

Sources: MDL Information Systems, Inc., MSDS *Chrysotile*, 15 June 2006.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use as a guide in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.

MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

SRM Number: 1866b
MSDS Number: 1866b
SRM Name: Common Commercial Asbestos

Date of Issue: 09 January 2007

MSDS Coordinator: Mario Cellarosi
Telephone: 301-975-6776
FAX: 301-926-4751
E-mail: SRMMSDS@nist.gov

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

Description: Standard Reference Material (SRM) 1866b is a set of three individual commercial-grade asbestos materials: chrysotile, **asbestiform grunerite (amosite)**, and asbestiform riebeckite (crocidolite). A unit of SRM 1866b consists of three bottles, each containing between 1 gram and 3 grams of individual material.

Substance: Asbestiform Grunerite

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS^(a)

Component:	Asbestiform Grunerite
Other Designations:	Asbestiform Grunerite (grunerite; amosite; brown asbestos; amosite asbestos)
CAS Number:	12172-73-5
EC Number (EINECS):	Not assigned.
SRM Nominal Concentration (% by weight or volume):	> 90
Component:	Magnetite (as an impurity)
Other Designation:	Magnetite (magnetic iron oxide; black iron oxide; magnetic iron ore; lodestone; black ferric oxide)
CAS Number:	1309-38-2
EC Number (EINECS):	215-169-8
SRM Nominal Concentration (% by weight):	< 5
Component:	Quartz
Other Designation:	Quartz (alpha quartz; silicon dioxide; silica; silicic anhydride; agate)
CAS Number:	14808-60-7
EC Number (EINECS):	238-878-4
SRM Nominal Concentration (% by weight):	< 5
EC Classification:	T Carcinogen Category 1
EC Risk (R No.):	23, 45, 48
EC Safety (S No.):	45, 53

^(a) Hazardous components 1 % or greater; carcinogens 0.1 % or greater are listed in compliance with OSHA 29 CFR 1910.1200.

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0–4): Health = 1 Fire = 0 Reactivity = 0
Major Health Hazards: Cancer hazard (in humans)

Potential Health Effects

Inhalation:

Inhalation of grunerite asbestos dust may be irritating. Symptoms include a cough and chest pain. Chronic exposure may cause asbestosis, interstitial fibrosis of the lung tissue, which may develop within 4 years to 9 years, but onset may be typically delayed 20 years to 40 years after first exposure. Death from asbestosis may be due to respiratory or cardiac failure. Secondary lung infections may also occur. Chronic exposure of asbestos to workers may also cause pleural effusion as early as 3 years to 4 years after initial exposure. Chronic exposure of asbestos to workers also increases the chance of pleural and peritoneal mesotheliomas, bronchogenic carcinoma, lung cancer, and cancers of the gastrointestinal tract and larynx. The latent period for mesothelioma is 3 years to 40 years; for lung cancer, 15 years to 30 years.

Skin Contact:

Direct contact may cause irritation. Asbestos fibers may penetrate the skin and result in "asbestos corns", due to thickening of the skin around the implanted fiber. These corns usually occur on the hands and forearms, and they disappear on removal of the fibers.

Eye Contact:

Direct contact may cause irritation with redness due to mechanical action.

Ingestion:

Acute exposure by cause gastrointestinal irritation. Chronic exposure of asbestos fibers may be involved in cancers of the buccal cavity and pharynx, esophagus, stomach, colon, and rectum.

Listed as a Carcinogen/ Potential Carcinogen:

Yes	No	
<u>X</u>	_____	In the National Toxicology Program (NTP) Report on Carcinogens.
<u>X</u>	_____	In the International Agency for Research on Cancer (IARC) Monographs.
<u>X</u>	_____	By the Occupational Safety and Health Administration (OSHA).

4. FIRST AID MEASURES

Inhalation:

If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration by qualified personnel. Get immediate medical attention.

Skin Contact:

Rinse affected area with copious amounts of water followed by washing with soap and water for at least 15 minutes while removing contaminated clothing. Get medical attention, if needed.

Eye Contact:

Flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Get immediate medical attention.

Ingestion:

If a large amount is swallowed, get immediate medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards:

Asbestiform grunerite is a negligible fire hazard.

Extinguishing Media:

Regular dry chemical. Carbon dioxide. Water. Regular foam.

Fire Fighting:

If material is involved in a fire, extinguish fire with a medium appropriate for the surrounding fire. Material itself does NOT burn or burns with difficulty. Keep run-off water out of sewers and water sources. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Component:

Asbestiform Grunerite

Flash Point:

Not applicable.

Method Used:

Not applicable.

Autoignition Temp.:

Not applicable.

Flammability Limits in Air

UPPER (Volume %):

Not applicable.

LOWER (Volume %):

Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Do NOT touch or walk through spilled material. Avoid inhalation of asbestos dust (see Section 8, "Exposure Controls and Personal Protection"). Collect small dry spills with a shovel and place material into an appropriate container for disposal. Prevent entry into waterways and sewers. Clean up residue with a HEPA filter vacuum.

Disposal: Refer to Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

Storage: Store and handle in accordance with all current regulations and standards.

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection".

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits: **Abestiform Grunerite**
OSHA (PEL): 0.1 fibers/cc TWA
ACGIH (TLV): 0.1 fibers/cc TWA
NIOSH: 0.1 fibers/cc recommended TWA (10 h)

Quartz

OSHA (PEL): 0.3 mg/m³ TWA (total dust) 30 mg/m³/‰ SiO₂ + 2, based on size/aerodynamic characteristics)
OSHA (PEL): 0.1 mg/m³ TWA (respirable dust) 10 mg/m³/‰ SiO₂ + 2, based on size/aerodynamic characteristics)
ACGIH (TLV): 0.025 mg m³ TWA (respirable dust)
NIOSH: 0.05 mg/m³ recommended TWA (10 h) (respirable dust)
UK WEL: 0.3 mg/m³ TWA (respirable particulate) (Chemical Hazard Alert Notice issued).

Ventilation: Provide local exhaust ventilation system equipped with a HEPA-filter dust collection system.

Respirator: If workplace conditions warrant a respirator's use, a NIOSH/MSHA approved respirator should be used under an implemented respiratory protection program in accordance with OSHA Standard 29 CFR 1910.134 (General Industry, Use of Respirators) and 29 CFR 1910.1001 for occupational exposure to asbestos.

Eye Protection: Wear safety goggles. An eye wash station should be readily available near areas of use.

Personal Protection: Wear appropriate protective clothing and gloves to prevent skin exposure. Refer to OSHA Regulated Substances: OSHA 29 CFR 1910.1001.

9. PHYSICAL AND CHEMICAL PROPERTIES

Component: **Asbestiform Grunerite**
Appearance: Fibrous solid to dust-like powder. Grey-brown to light brown. Odorless.
Relative Molecular Mass: Not applicable.
Molecular Formula: Fe²⁺₇(Si₈O₂₂)(OH)₂
Water Solubility: Insoluble

10. STABILITY AND REACTIVITY

Stability: X Stable Unstable

Stable at normal temperatures and pressure.

Conditions to Avoid: Avoid generating dust. Keep out of water supplies and sewers.

Incompatible Materials: May be attacked by strong acids.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Completely decomposes at temperatures of 1 000 °C.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: X Inhalation X Skin X Ingestion

Toxicity Data: **Asbestiform Grunerite**
Rat, Intrapleural TD_{LO}: 150 mg/kg

Tumorigenic, Reproductive, Mutagenic Data: Asbestiform grunerite has been investigated as a tumorigenic and mutagenic effector.

Health Effects (Acute and Chronic): See Section 3: "Hazards Identification" for potential health effects.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: Not available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: **U.S. DOT and IATA:** Asbestos; UN2212; Hazard Class 9
NOTE: This material, as packaged for SRM 1866b, is not subject to the regulations per DOT Special Provision 156 and IATA special Provision A61.

15. REGULATORY INFORMATION

U.S. Regulations: CERCLA Sections 102a/103 (40 CFR 302.4): Asbestos: 1 lbs RQ.
SARA Title III Section 302 (40 CFR 355.30): Not regulated.
SARA Title III Section 304 (40 CFR 355.40): Not regulated.
SARA Title III Section 313 (40 CFR 372.65): Asbestos.
OSHA Process Safety (29 CFR 1910.119): Not regulated.
SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE: No.
CHRONIC: Yes.
FIRE: No.
REACTIVE: No.
SUDDEN RELEASE: No.

State Regulations: California Proposition 65: Asbestos is known to the state of California to cause cancer (Feb. 27, 1987).

CANADIAN Regulations
WHMIS Classification: Not determined for this material.

EUROPEAN Regulations
EC Classification (assigned): T Toxic.
Carcinogen Category 1

EC Risk Phrases: R45 May cause cancer.
R23/48 Toxic: danger of serious damage to health by prolonged exposure through inhalation.

EC Safety Phrases: S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S53 Avoid exposure.

National Inventory Status

U.S. Inventory (TSCA):	Asbestos:	Not listed on inventory.
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TSCA 12(b)

Export Notification:	Asbestos:	CAS No.: 1332-21-4 Section 6
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16. OTHER INFORMATION

Sources: MDL Information Systems, Inc., MSDS *Amosite*, 16 June 2005.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use as a guide in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.

MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

SRM Number: 1866b
MSDS Number: 1866b
SRM Name: Common Commercial Asbestos

Date of Issue: 09 January 2007

MSDS Coordinator: Mario Cellarosi
Telephone: 301-975-6776
FAX: 301-926-4751
E-mail: SRMMSDS@nist.gov

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

Description: Standard Reference Material (SRM) 1866b is a set of three individual commercial-grade asbestos materials: chrysotile, asbestiform grunerite (amosite), and **asbestiform riebeckite (crocidolite)**. A unit of SRM 1866b consists of three bottles, each containing between 1 gram and 3 grams of individual material.

Substance: Asbestiform Riebeckite

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS^(a)

Component:	Asbestiform Riebeckite
Other Designations:	Asbestiform Riebeckite (blue asbestos; crocidolite; asbestos; crocidolite asbestos)
CAS Number:	12001-28-4
EC Number (EINECS):	Not assigned.
SRM Nominal Concentration (% by weight or volume):	> 90
Component:	Magnetite (as an impurity)
Other Designation:	Magnetite (magnetic iron oxide; black iron oxide; magnetic iron ore; lodestone; black ferric oxide)
CAS Number:	1309-38-2
EC Number (EINECS):	215-169-8
SRM Nominal Concentration (% by weight):	< 5
EC Classification:	T Carcinogen Category 1
EC Risk (R No.):	23, 45, 48
EC Safety (S No.):	45, 53

^(a) Hazardous components 1 % or greater; carcinogens 0.1 % or greater are listed in compliance with OSHA 29 CFR 1910.1200.

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0–4): Health = 1 Fire = 0 Reactivity = 0

Major Health Hazards: Cancer hazard (in humans)

Potential Health Effects

Inhalation: Inhalation of riebeckite asbestos dust may be irritating. Symptoms include a cough and chest pain. Chronic exposure may cause asbestosis, interstitial fibrosis of the lung tissue, which may develop within 4 years to 9 years, but onset may be typically delayed 20 years to 40 years after first exposure. Death from asbestosis may be due to respiratory or cardiac failure. Secondary lung infections may also occur. Chronic exposure of asbestos to workers may also cause pleural effusion as early as 3 years to 4 years after initial exposure. Chronic exposure of asbestos to workers also increases the chance of pleural and peritoneal mesotheliomas, bronchogenic carcinoma, lung cancer, and cancers of the gastrointestinal tract and larynx. The latent period for mesothelioma is 3 years to 40 years; for lung cancer, 15 years to 30 years.

Skin Contact: Direct contact may cause irritation. Asbestos fibers may penetrate the skin and result in "asbestos corns", due to thickening of the skin around the implanted fiber. These corns usually occur on the hands and forearms, and they disappear on removal of the fibers.

Eye Contact: Direct contact may cause irritation with redness due to mechanical action.

Ingestion: Acute exposure by cause gastrointestinal irritation. Chronic exposure of asbestos fibers may be involved in cancers of the buccal cavity and pharynx, esophagus, stomach, colon, and rectum.

**Listed as a Carcinogen/
Potential Carcinogen:**

Yes	No	
<u>X</u>	_____	In the National Toxicology Program (NTP) Report on Carcinogens.
<u>X</u>	_____	In the International Agency for Research on Cancer (IARC) Monographs.
<u>X</u>	_____	By the Occupational Safety and Health Administration (OSHA).

4. FIRST AID MEASURES

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration by qualified personnel. Get immediate medical attention.

Skin Contact: Rinse affected area with copious amounts of water followed by washing with soap and water for at least 15 minutes while removing contaminated clothing. Get medical attention, if needed.

Eye Contact: Flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Get immediate medical attention.

Ingestion: Get immediate medical attention. If vomiting occurs, keep head lower than hips to prevent aspiration. Give artificial respiration, if not breathing, by qualified personnel.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Asbestiform Riebeckite

Extinguishing Media: Regular dry chemical. Carbon dioxide. Water. Regular foam.

Fire Fighting: If material is involved in a fire, extinguish fire with a medium appropriate for the surrounding fire. Material itself does NOT burn or burns with difficulty. Keep run-off water out of sewers and water sources. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Component: Asbestiform Riebeckite

Flash Point: Not applicable.

Method Used: Not applicable.

Autoignition Temp.: Not applicable.

Flammability Limits in Air

UPPER (Volume %): Not applicable.

LOWER (Volume %): Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Do NOT touch or walk through spilled material. Avoid inhalation of asbestos dust (see Section 8, "Exposure Controls and Personal Protection"). Collect small dry spills with a shovel and place material into an appropriate container for disposal. Prevent entry into waterways and sewers. Clean up residue with a HEPA filter vacuum.

Disposal: Refer to Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

Storage:	Store and handle in accordance with all current regulations and standards. Store in a cool, dry place.
Safe Handling Precautions:	See Section 8, "Exposure Controls and Personal Protection".

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:	Asbestiform Riebeckite OSHA (PEL): 0.1 fibers/cc TWA ACGIH (TLV): 0.1 fibers/cc TWA NIOSH: 0.1 fibers/cc recommended TWA (10 h)
Ventilation:	Provide local exhaust ventilation system equipped with HEPA-filter dust collection system.
Respirator:	If workplace conditions warrant a respirator's use, a NIOSH/MSHA approved respirator should be used under an implemented respiratory protection program in accordance with OSHA Standard 29 CFR 1910.134 (General Industry, Use of Respirators) and 29 CFR 1910.1001 for occupational exposure to asbestos.
Eye Protection:	Wear safety goggles. An eye wash station should be readily available near areas of use.
Personal Protection:	Wear appropriate protective clothing and gloves to prevent skin exposure. Refer to OSHA Regulated Substances: OSHA 29 CFR 1910.1001.

9. PHYSICAL AND CHEMICAL PROPERTIES

Component:	Asbestiform Riebeckite
Appearance:	Fibrous solid to dust-like powder. Blue to purple color. Odorless.
Molecular Formula:	$\text{Na}_2(\text{Fe}^{2+}_3\text{Fe}^{3+}_2)(\text{Si}_8\text{O}_{22})(\text{OH})_2$
Water Solubility:	Insoluble.

10. STABILITY AND REACTIVITY

Stability:	☒ Stable ☐ Unstable Stable at normal temperatures and pressure.
Conditions to Avoid:	Avoid generating dust. Keep out of water supplies and sewers.
Incompatible Materials:	May be attacked by strong acids.
Fire/Explosion Information:	See Section 5, "Fire Fighting Measures".
Hazardous Decomposition:	Completely decomposes at temperatures of 1 000 °C.
Hazardous Polymerization:	☐ Will Occur ☒ Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry:	☒ Inhalation ☒ Skin ☒ Ingestion
Toxicity Data:	Asbestiform Riebeckite Rat, Intraperitoneal LD ₅₀ : 300 mg/kg Rat, Inhalation-Intermittent TC _{LO} : 7 200 µg/m ³ (6 h – 20 days) Rat, Inhalation-Intermittent TC _{LO} : 13 600 µg/m ³ (6 h – 5 days)
Tumorigenic, Reproductive, Mutagenic Data:	Riebeckite asbestos has been investigated as a tumorigenic and mutagenic effector.
Health Effects (Acute and Chronic):	See Section 3: "Hazards Identification" for potential health effects.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: Not available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: **U.S. DOT and IATA:** Asbestos; UN2212; Hazard Class 9
NOTE: This material, as packaged for SRM 1866b, is not subject to the regulations per DOT Special Provision 156 and IATA special Provision A61.

15. REGULATORY INFORMATION

U.S. Regulations: CERCLA Sections 102a/103 (40 CFR 302.4): Asbestos: 1 lbs RQ.
SARA Title III Section 302 (40 CFR 355.30): Not regulated.
SARA Title III Section 304 (40 CFR 355.40): Not regulated.
SARA Title III Section 313 (40 CFR 372.65): Asbestos.
OSHA Process Safety (29 CFR 1910.119): Not regulated.
SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE: No.
CHRONIC: Yes.
FIRE: No.
REACTIVE: No.
SUDDEN RELEASE: No.

State Regulations: California Proposition 65: Asbestos is known to the state of California to cause cancer (Feb. 27, 1987)

CANADIAN Regulations

WHMIS Classification: Not determined.

EUROPEAN Regulations

EC Classification (assigned): T Toxicity.
Carcinogen Category 1.

EC Risk Phrases: R45 May cause cancer.
R23/48 Toxic: danger of serious damage to health by prolonged exposure through inhalation.

EC Safety Phrases: S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S53 Avoid exposure.

National Inventory Status

U.S. Inventory (TSCA): Asbestos: Not listed on inventory.

TSCA 12(b)

Export Notification: Asbestos: CAS No. 1332-21-4
Section 6

16. OTHER INFORMATION

Sources: MDL Information Systems, Inc., MSDS *Crocidolite*, 14 September 2006.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use as a guide in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.



MATERIAL SAFETY DATA SHEET

(POLYCHLORINATED BIPHENYLS)

COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients Name: polychlorinated biphenyls (PCBs)

HAZARD IDENTIFICATION

Reports of Carcinogenicity: YES

HEALTH HAZARDS ACUTE AND CHRONIC

- **Eyes**: Moderately irritating to eye tissues.
- **Skin**: Can be absorbed through intact skin, may cause de-fatting, potential for chloracne.
- **Inhalation**: Possible liver injury.
- **Ingestion**: Slightly toxic; reasonably anticipated to be carcinogenic.

EFFECTS OF OVER-EXPOSURE

Can cause dermatological symptoms; however, these are reversible upon removal of exposure source.

FIRST AID MEASURES

- **Eyes**: Irrigate immediately with copious quantities of running water for at least 15 minutes if liquid or solid PCBs get into them.
- **Skin**: Contaminated clothing should be removed and the skin washed thoroughly with soap and water. Hot PCBs may cause thermal burns.
- **Inhalation**: Remove to fresh air; if skin rash or respiratory irritation persists, consult a physician (if electrical equipment arcs over, PCBs may decompose to produce hydrochloric acid).
- **Ingestion**: Consult a physician. Do not induce vomiting or give any oily laxatives. (If large amounts are ingested, gastric lavage is suggested).

FIRE FIGHTING MEASURES: Flash Point: >141 °C (285.8 °F)

EXTINGUISHING MEDIA: PCBs are fire-resistant compounds.

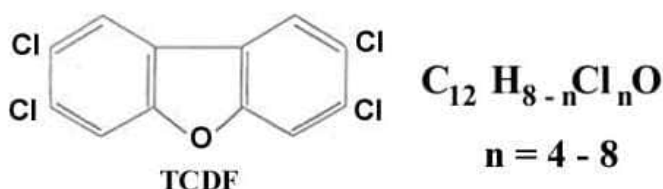
FIRE-FIGHTING PROCEDURES

Standard fire-fighting wearing apparel and self-contained breathing apparatus should be worn when fighting fires that involve possible exposure to chemical combustion products. Fire fighting equipment should be thoroughly cleaned and decontaminated after use.

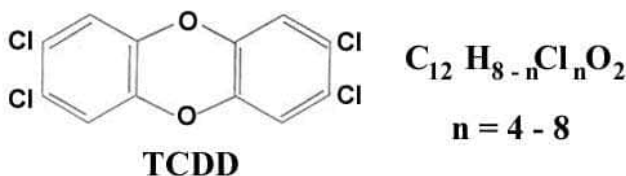
UNUSUAL FIRE/EXPLOSION HAZARD

If a PCB transformer is involved in a fire-related incident, the owner of the transformer is required to report the incident. Consult and follow appropriate federal, provincial and local regulations.

Note: When askarel liquid becomes involved in a fire, toxic by-products of combustion are typically produced including polychlorinated dibenzofurans and polychlorinated dibenzodioxins, both known carcinogens. The structures of these chemical species are as follows:



2,3,7,8-tetrachlorodibenzofuran



2,3,7,8-tetrachloro-dibenzo-p-dioxin

Note: 2,3,7,8-tetrachloro-dibenzo-p-dioxin is one of the most potent teratogenic, mutagenic and carcinogenic agents known to man.

SPILL RELEASE PROCEDURES

Cleanup & disposal of liquid PCBs are strictly regulated by the federal government. Ventilate area. Contain spill/leak. Remove spill by means of absorptive material. Spill clean-up personnel should use proper protective clothing. All wastes and residues containing PCBs should be collected, containerized, marked and disposed of in the manner prescribed by applicable federal, provincial and local laws.

HANDLING AND STORAGE PRECAUTIONS

Care should be taken to prevent entry into the environment through spills, leakage, use, vaporization, or disposal of liquid. Avoid prolonged breathing of vapours or mists. Avoid contact with eyes or prolonged contact with skin. Comply with all federal, provincial and local regulations.

OTHER PRECAUTIONS

Federal regulations require PCBs, PCB items, storage areas, transformer vaults, and transport vehicles to be appropriately labelled.

RESPIRATORY PROTECTION

Use OSHA approved equipment when airborne exposure limits are exceeded. Full facepiece equipment is recommended and, if used, replaces need for face shield and/or chemical splash goggles. The respirator use limitations specified by the manufacturer must be observed.

VENTILATION

Provide natural or mechanical ventilation to control exposure levels below airborne exposure levels.

PROTECTIVE GLOVES: Wear appropriate chemical resistant gloves to prevent skin contact.

EYE PROTECTION: Wear chemical splash goggles and have eye baths available.

OTHER PROTECTIVE EQUIPMENT

Wear appropriate protective clothing. Provide a safety shower at any location where skin contact can occur.

WORK HYGIENIC PRACTICES

Wash thoroughly after handling. Supplemental safety and health : none

PHYSICAL/CHEMICAL PROPERTIES

- **Vapour pressure:** (mm Hg @100 °F) 0.005 - 0.00006
- **Viscosity:** (CENTISTOKES) 3.6 - 540
- **Stability indicator/materials to avoid:** Yes
- **Stability Condition to Avoid:** PCBs are very stable, fire-resistant compounds.

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide, hydrogen chloride, phenolics, aldehydes, furans, dioxins

WASTE DISPOSAL METHODS

Consult the applicable PCB regulations prior to any disposal of PCBs or PCB-contaminated items.

SAFETY DATA SHEET



Castrol Multipurpose Grease

Section 1. Chemical product and company identification

GHS product identifier Castrol Multipurpose Grease
Product code 467223-TR01
SDS no. 467223

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

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

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

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

Section 2. Hazards identification

Classification of the substance or mixture Not classified.

GHS label elements

Signal word No signal word.
Hazard statements No known significant effects or critical hazards.
Precautionary statements
Prevention Not applicable.
Response Not applicable.
Storage Not applicable.
Disposal Not applicable.

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

Section 3. Composition/information on ingredients

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

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

Product name Castrol Multipurpose Grease **Product code** 467223-TR01 **Page:** 1/8
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Section 3. Composition/information on ingredients

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

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

Section 4. First aid measures

Description of necessary first aid measures

Inhalation	If inhaled, remove to fresh air. Get medical attention if symptoms occur.
Ingestion	Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
Skin contact	Wash skin thoroughly with soap and water or use recognised skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.
Eye contact	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.

Most important symptoms/effects, acute and delayed

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

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

Specific treatments	No specific treatment.
Notes to physician	Treatment should in general be symptomatic and directed to relieving any effects. Note: High Pressure Applications Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discoloured and extremely painful with extensive subcutaneous necrosis. Surgical exploration should be undertaken without delay. Thorough and extensive debridement of the wound and underlying tissue is necessary to minimise tissue loss and prevent or limit permanent damage. Note that high pressure may force the product considerable distances along tissue planes.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training.

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media	In case of fire, use water fog, alcohol resistant foam, dry chemical or carbon dioxide extinguisher or spray.
Unsuitable extinguishing media	Do not use water jet.

Specific hazards arising from the chemical

Hazardous thermal decomposition products	In a fire or if heated, a pressure increase will occur and the container may burst. Combustion products may include the following: metal oxide/oxides carbon oxides (CO, CO ₂) (carbon monoxide, carbon dioxide)
--	---

Special protective actions for fire-fighters

Special protective equipment for fire-fighters	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.
--	---

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

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

For emergency responders

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

Environmental precautions

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

Methods and material for containment and cleaning up

Small spill

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

Large spill

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

Section 7. Handling and storage

Precautions for safe handling

Protective measures

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

Advice on general occupational hygiene

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

Conditions for safe storage, including any incompatibilities

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

Not suitable

Prolonged exposure to elevated temperature

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

Section 8. Exposure controls/personal protection

Appropriate engineering controls

Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits. All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.

Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.

The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls

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

Individual protection measures

Hygiene measures

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

Eye/face protection

Safety glasses with side shields.

Skin protection

Hand protection

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

Body protection

Use of protective clothing is good industrial practice.

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.

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

Section 9. Physical and chemical properties

Appearance

Physical state	Grease
Colour	Amber. [Light]
Odour	Not available.
Odour threshold	Not available.
pH	Not available.
Melting point	Not available.
Boiling point	Not available.
Flash point	Closed cup: 228°C (442.4°F) [Pensky-Martens.]
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable. Based on - Physical state
Lower and upper explosive (flammable) limits	Not available.
Vapour pressure	Not available.
Vapour density	Not available.
Relative density	Not available.
Density	1000 kg/m ³ (1 g/cm ³) at 15°C
Solubility	insoluble in water.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.

Section 10. Stability and reactivity

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

Section 11. Toxicological information

Information on toxicological effects

Specific target organ toxicity (repeated exposure)

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

Section 11. Toxicological information

Information on likely routes of exposure

Routes of entry anticipated: Dermal, Inhalation.

Potential acute health effects

Eye contact

No known significant effects or critical hazards.

Inhalation

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

Skin contact

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

Ingestion

No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact

No specific data.

Inhalation

No specific data.

Skin contact

Adverse symptoms may include the following:
irritation
dryness
cracking

Ingestion

No specific data.

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

Eye contact

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

Inhalation

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

Skin contact

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

Ingestion

Ingestion of large quantities may cause nausea and diarrhoea.

Potential chronic health effects

General

No known significant effects or critical hazards.

Carcinogenicity

No known significant effects or critical hazards.

Mutagenicity

No known significant effects or critical hazards.

Teratogenicity

No known significant effects or critical hazards.

Developmental effects

No known significant effects or critical hazards.

Fertility effects

No known significant effects or critical hazards.

Section 12. Ecological information

Environmental effects

No known significant effects or critical hazards.

Persistence and degradability

Expected to be biodegradable.

Bioaccumulative potential

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

Mobility in soil

Mobility

Spillages are unlikely to penetrate the soil.

Other ecological information

This product is unlikely to disperse in water.

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Section 12. Ecological information

Section 13. Disposal considerations

Disposal methods

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

Section 14. Transport information

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

Special precautions for user Not available.

Section 15. Regulatory information

Regulation according to other foreign laws

REACH Status

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

United States inventory (TSCA 8b)

Not determined.

Australia inventory (AICS)

All components are listed or exempted.

Canada inventory

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

China inventory (IECSC)

All components are listed or exempted.

Japan inventory (ENCS)

Not determined.

Korea inventory (KECI)

All components are listed or exempted.

Philippines inventory (PICCS)

Not determined.

Taiwan Chemical Substances Inventory (TCSI)

All components are listed or exempted.

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Section 15. Regulatory information

Section 16. Other information

History

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

Indicates information that has changed from previously issued version.

Notice to reader

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

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

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



Product Name: COMMERCIAL PROPANE (NON ODORIZED)
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SAFETY DATA SHEET

SECTION 1 IDENTIFICATION

PRODUCT

Product Name: COMMERCIAL PROPANE (NON ODORIZED)
Product Description: Liquefied Hydrocarbon Gas, Gas or Liquefied Gas
SDS Number: 13602

Intended Use: Fuel gas

COMPANY IDENTIFICATION

Supplier: Imperial Oil Downstream
P.O. Box 2480, Station M
Calgary, ALBERTA T2P 3M9 Canada

24 Hour 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 HAZARD IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines.

This product has been classified in accordance with hazard criteria of the Hazardous Products Regulations (HPR) SOR/2015-17 and the SDS contains all the information required by the HPR SOR/2015-17.

CLASSIFICATION:

Flammable Gases — Category 1
Gases Under Pressure — Liquefied Gas
Simple Asphyxiants — Category 1

LABEL:

Pictogram:

Product Name: COMMERCIAL PROPANE (NON ODORIZED)
Revision Date: 05 May 2022
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Signal Word: Danger

Hazard Statements:

H220: Extremely flammable gas. H280: Contains gas under pressure; may explode if heated. May displace oxygen and cause rapid suffocation.

Precautionary Statements:

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P381: In case of leakage, eliminate all ignition sources. P410 + P403: Protect from sunlight. Store in a well-ventilated place.

Other hazard information:

Health Hazards Not Otherwise Classified: None as defined under HPR SOR/2015-17.

Physical Hazards Not Otherwise Classified: None as defined under HPR SOR/2015-17.

PHYSICAL / CHEMICAL HAZARDS

Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling. Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. Frostbite hazard - rapidly expanding gas or liquid may cause frostbite. 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.

HEALTH HAZARDS

High-pressure injection under skin may cause serious damage. Exposure to concentrations above 10% of the LEL may cause a general central nervous system (CNS) depression typical of anesthetic gases or intoxicants. Excessive exposure may result in eye, skin, or respiratory irritation.

ENVIRONMENTAL HAZARDS

No significant hazards.

NFPA Hazard ID:	Health: 1	Flammability: 4	Reactivity: 0
HMIS Hazard ID:	Health: 1	Flammability: 4	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.

This material is defined as a mixture.

Hazardous Substance(s) or Complex Substance(s) in Hazardous product

Name	CAS#	Concentration*	GHS Hazard Codes
ALKANES, C4	68513-65-5	1 - 2.5%	H220
ETHANE	74-84-0	1 - 5%	H220, H280
ISOBUTANE	75-28-5	1 - 2.5%	H220, H280
PROPANE	74-98-6	90 - 99%	H220, H280
PROPYLENE	115-07-1	1 - 10%	H220, H280

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

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

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. If frostbite occurs, immerse involved area in water at body temperature. Keep immersed for 20 to 40 minutes. Seek medical assistance.

EYE CONTACT

Flush thoroughly with water for at least 15 minutes. Get medical assistance.

INGESTION

Not Applicable

NOTE TO PHYSICIAN

This material, or a component, may be associated with cardiac sensitization 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, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Allow the fire to burn under controlled conditions. Stop leak if you can do so without risk. Evacuate area. If a leak or spill has not ignited, use water spray to disperse the vapours and to



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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: Flammable Gas. 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: Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: -103°C (-153°F) [ASTM D-92]

Flammable Limits (Approximate volume % in air): LEL: 2.4 UEL: 9.5

Autoignition Temperature: 432°C (810°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 or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of the 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 provide chemical resistance and, when necessary, heat-resistance and/or thermal insulation are recommended. Note: gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Small spills: normal work clothes are usually adequate. Large spills: full body suit of chemical and thermal resistant material is recommended. Chemical goggles and face shield are recommended if contact with liquefied gas is possible.

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. CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning. Allow liquid to evaporate from the surface. All equipment used when handling the product must be grounded. Do not direct water at spill or source of leak. Do not touch or walk through spilled material. If possible, turn leaking containers so that gas escapes rather than liquid. Isolate area until gas has dispersed. Prevent spreading of vapour through sewers, ventilation systems and confined areas. Use water spray to reduce vapour or divert vapour cloud drift. Avoid allowing water run-off to contact spilled material.

Water Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Allow



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liquid to evaporate from the surface. See Land Spill section of the SDS for advice on gases.

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

Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent exposure to ignition sources, for example use non-sparking tools and explosion-proof equipment. Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation. Material can accumulate static charges which may cause an electrical spark (ignition source).

Static Accumulator: This material is a static accumulator.

STORAGE

Ample fire water supply should be available. A fixed sprinkler/deluge system is recommended. The type of container used to store the material may affect 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.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Substance Name	Form	Limit/Standard			Note	Source
ETHANE		Limit value not established			Simple asphyxiant.	ACGIH
ISOBUTANE		STEL	1000 ppm			ACGIH
PROPANE		Limit value not established			Simple asphyxiant.	ACGIH
PROPYLENE		TWA	500 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 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:

Thermally protective, chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet-style gloves.

Eye Protection: Face shield is 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:

Thermally protective and chemical resistant apron and long sleeves are recommended when volume of material is significant.

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
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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

Product Name: COMMERCIAL PROPANE (NON ODORIZED)
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Physical State: Gas
Form: Liquefied
Colour: Colourless
Odour: Odourless
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.51
Flammability (Solid, Gas): Flammable - Category 1
Flash Point [Method]: -103°C (-153°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 2.4 UEL: 9.5
Autoignition Temperature: 432°C (810°F)
Boiling Point / Range: -42°C (-44°F)
Decomposition Temperature: N/D
Vapour Density (Air = 1): 1.5 at 101 kPa
Vapour Pressure: 850 kPa (6375 mm Hg) at 20°C
Evaporation Rate (n-butyl acetate = 1): > 1
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): N/A
Solubility in Water: Negligible
Viscosity: 0.5 cSt (0.5 mm²/sec) at 40°C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: >-187°C (-305°F)

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.

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: (Rat) 15 minute(s) LC50 1443 mg/l (Gas)	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 403
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures.
Ingestion	

Acute Toxicity: No end point data for material.	Not applicable.
Skin	
Acute Toxicity: No end point data for material.	Not applicable.
Skin Corrosion/Irritation: No end point data for material.	Negligible irritation to skin at ambient temperatures.
Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes.
Sensitisation	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer.
Aspiration: No end point data for material.	Not expected to be an aspiration hazard. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: Data available.	Not expected to be a germ cell mutagen. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 471
Carcinogenicity: No end point data for material.	Not expected to cause cancer.
Reproductive Toxicity: Data available.	Not expected to be a reproductive toxicant. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 422
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: Data available.	Not expected to cause organ damage from prolonged or repeated exposure. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 422

OTHER INFORMATION

For the product itself:

May cause central nervous system disorder (e.g., narcosis involving a loss of coordination, weakness, fatigue, mental confusion and blurred vision) and/or damage. Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite (cold burn). Exposure to this material, or one of its components, in situations where there is the potential for high levels, such as in confined spaces or with abuse, may result in abnormal heart rhythm (arrhythmia). High-level exposure to hydrocarbons (above occupational exposure limits) may initiate arrhythmia in a worker that is undergoing stress or is taking a heart-stimulating substance such as epinephrine, a nasal decongestant, or an asthma or cardiovascular drug. Simple asphyxiant: Acts by displacing oxygen in the lungs thereby diminishing the supply of oxygen available to the blood and tissues. Symptoms include shortness of breath, rapid heart rate, incoordination, lethargy, headaches, nausea, vomiting, and disorientation. Continued lack of oxygen may result in convulsions, loss of consciousness and death. Since exercise increases the tissue need for oxygen, symptoms will occur more quickly during exertion in an oxygen-deficient environment. Oxygen in enclosed spaces should be maintained at 21 percent by volume.

CMR Status: None.



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--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 for the material, components of the material, or for similar materials, through the application of bridging principals.

ECOTOXICITY

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

MOBILITY

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

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Material -- Expected to be inherently biodegradable

Atmospheric Oxidation:

Material -- Expected to degrade at a moderate rate in air

BIOACCUMULATION POTENTIAL

Material -- Potential to bioaccumulate is low.

SECTION 13	DISPOSAL CONSIDERATIONS
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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
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LAND (TDG)

Proper Shipping Name: LIQUEFIED PETROLEUM GASES, not odorized



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Hazard Class & Division: 2.1
UN Number: 1075
Packing Group: (N/A)

LAND (DOT)

Proper Shipping Name: PETROLEUM GASES, LIQUEFIED
Hazard Class & Division: 2.1
ID Number: 1075
Packing Group: (N/A)
ERG Number: 115
Label(s): 2.1
Transport Document Name: UN1075, PETROLEUM GASES, LIQUEFIED, 2.1

SEA (IMDG)

Proper Shipping Name: PETROLEUM GASES, LIQUEFIED
Hazard Class & Division: 2.1
EMS Number: F-D, S-U
UN Number: 1075
Packing Group: (N/A)
Marine Pollutant: No
Label(s): 2.1
Transport Document Name: UN1075, PETROLEUM GASES, LIQUEFIED, 2.1 (-103°C c.c.)

AIR (IATA)

Proper Shipping Name: PETROLEUM GASES, LIQUEFIED
Hazard Class & Division: 2.1
UN Number: 1075
Packing Group: (N/A)
Label(s) / Mark(s): 2.1
Transportation Limitations: CARGO AIRCRAFT ONLY
Transport Document Name: UN1075, PETROLEUM GASES, LIQUEFIED, 2.1

SECTION 15

REGULATORY INFORMATION

CEPA: All components of this product are either on the Domestic Substance List (DSL) or are exempt.

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

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
ETHANE	74-84-0	6
ISOBUTANE	75-28-5	6
PROPANE	74-98-6	6
PROPYLENE	115-07-1	6



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--REGULATORY LISTS SEARCHED--

1 = TSCA 4
2 = TSCA 5a2

3 = TSCA 5e
4 = TSCA 6

5 = TSCA 12b
6 = NPRI

SECTION 16	OTHER INFORMATION
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N/D = Not determined, N/A = Not applicable

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):

H220: Extremely flammable gas; Flammable Gas, Cat 1

H280: Contains gas under pressure; may explode if heated; Pressurized Gas

H402: Harmful to aquatic life; Acute Env Tox, Cat 3

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Composition: Component table information was modified.

The information and recommendations contained herein are, to the best of Imperial Oil's knowledge and belief, accurate and reliable as of the date issued. Imperial Oil assumes no responsibility for accuracy of information unless the document is the most current available from an official Imperial Oil distribution system. The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal counsel should be consulted to insure proper health, safety and other necessary information is included on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, republication or retransmission of this document, in whole or in part, is not permitted.

DGN: 5011696 (1010551)

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Product Name: MOBIL PERMAZONE ANTIFREEZE AND COOLANT
 Revision Date: 15 Feb 2022
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SAFETY DATA SHEET

SECTION 1 IDENTIFICATION

PRODUCT

Product Name: MOBIL PERMAZONE ANTIFREEZE AND COOLANT
Product Description: Glycol
SDS Number: 21004
Product Code: 351010101506
Intended Use: Antifreeze/coolant

COMPANY IDENTIFICATION

Supplier: Imperial Oil Downstream
 P.O. Box 2480, Station M
 Calgary, ALBERTA T2P 3M9 Canada

24 Hour 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 HAZARD IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines.

This product has been classified in accordance with hazard criteria of the Hazardous Products Regulations (HPR) SOR/2015-17 and the SDS contains all the information required by the HPR SOR/2015-17.

CLASSIFICATION:

Acute Toxicity (Oral) — Category 4
 Specific Target Organ Toxicity — Repeated Exposure — Category 2

LABEL:

Pictogram:





Product Name: MOBIL PERMAZONE ANTIFREEZE AND COOLANT
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Signal Word: Warning

Hazard Statements:

H302: Harmful if swallowed. H373: May cause damage to organs through prolonged or repeated exposure. Kidney

Precautionary Statements:

P101: If medical advice is needed, have product container or label at hand. P102: Keep out of reach of children.
P103: Read label before use. P260: Do not breathe mist / vapours. P264: Wash skin thoroughly after handling.
P270: Do not eat, drink or smoke when using this product. P301 + P312: IF SWALLOWED: Call a POISON CENTER
or doctor/physician if you feel unwell. P314: Get medical advice/attention if you feel unwell. P330: Rinse
mouth. P501: Dispose of contents and container in accordance with local regulations.

Contains: ETHYLENE GLYCOL

Other hazard information:

Health Hazards Not Otherwise Classified: None as defined under HPR SOR/2015-17.

Physical Hazards Not Otherwise Classified: None as defined under HPR SOR/2015-17.

PHYSICAL / CHEMICAL HAZARDS

No significant hazards.

HEALTH HAZARDS

High-pressure injection under skin may cause serious damage. Ingestion may cause serious adverse effects and may be fatal. May cause kidney failure and central nervous system effects. Prolonged exposure to elevated concentrations of mist or liquid may cause irritation of the skin, eyes, and respiratory tract.

ENVIRONMENTAL HAZARDS

No significant hazards.

NFPA Hazard ID:	Health: 1	Flammability: 1	Reactivity: 0
HMIS Hazard ID:	Health: 2*	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 3	COMPOSITION / INFORMATION ON INGREDIENTS
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This material is defined as a mixture.

Hazardous Substance(s) or Complex Substance(s) in Hazardous product

Name	CAS#	Concentration*	GHS Hazard Codes
ETHYLENE GLYCOL	107-21-1	90 - 99%	H302, H373



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

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. 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.

NOTE TO PHYSICIAN

This product contains ethylene glycol and/or diethylene glycol which, if ingested, are metabolized to toxic metabolites by the enzyme alcohol dehydrogenase, for which ethanol and 4-methylpyrazole \\U.S. drug name Fomepizole, trade name Antizol\\ are antagonists. Administration of oral or intravenous ethanol or intravenous 4-methylpyrazole may arrest further metabolism of this material and thereby ameliorate the toxicity. Use of ethanol or 4-methylpyrazole does not affect toxic metabolites that are already present and is not a substitute for hemodialysis.

SECTION 5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

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

Inappropriate Extinguishing Media: Straight streams of water or standard foam

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: Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

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

FLAMMABILITY PROPERTIES

Flash Point [Method]: 115°C (239°F) [ASTM D-92]

Flammable Limits (Approximate volume % in air): LEL: 3.2 UEL: 15

Autoignition Temperature: 400°C (752°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.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do so without risk. Do not touch or walk through spilled material. Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do so without risk. Consult an expert. Warn other shipping. Material will sink. Remove material, as much as possible, using mechanical equipment.

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

Remove debris in path of spill and remove contaminated debris from shoreline and water surface. Dispose of according to local regulations. 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 contact with skin. Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is not a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Substance Name	Form	Limit/Standard			Note	Source
ETHYLENE GLYCOL	Aerosol, inhalable	STEL	10 mg/m ³			ACGIH
ETHYLENE GLYCOL	Vapor fraction	STEL	50 ppm			ACGIH
ETHYLENE GLYCOL	Vapor fraction	TWA	25 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:

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 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:

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 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: Green
Odour: Characteristic
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 1.115
Flammability (Solid, Gas): N/A
Flash Point [Method]: 115°C (239°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 3.2 UEL: 15
Autoignition Temperature: 400°C (752°F)
Boiling Point / Range: 197°C (387°F)
Decomposition Temperature: N/D
Vapour Density (Air = 1): 2.1 at 101 kPa [n-Butyl Acetate]
Vapour Pressure: 0.008 kPa (0.06 mm Hg) at 20°C
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/D
Log Pow (n-Octanol/Water Partition Coefficient): < 2
Solubility in Water: Complete
Viscosity: [N/D at 40°C]
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: -13°C (9°F)
Melting Point: 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 Acids, Strong oxidizers

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

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures.
Ingestion	
Acute Toxicity (Human): LDLo 100 ml	Moderately toxic. Based on assessment of the components.
Skin	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin Corrosion/Irritation: No end point data for material.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.
Sensitisation	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer. Based on assessment of the components.
Aspiration: No end point data for material.	Not expected to be an aspiration hazard. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: No end point data for material.	Not expected to be a germ cell mutagen. Based on assessment of the components.
Carcinogenicity: No end point data for material.	Not expected to cause cancer. Based on assessment of the components.
Reproductive Toxicity: No end point data for material.	Not expected to be a reproductive toxicant. Based on assessment of the components.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: No end point data for material.	Concentrated, prolonged or deliberate exposure may cause organ damage. Based on assessment of the components.

OTHER INFORMATION

For the product itself:

Target Organs Repeated Exposure: Kidney

Contains:

ETHYLENE GLYCOL (EG): Repeated high oral exposure has caused kidney damage, neurological effects,

degeneration of the liver and changes in blood chemistry and circulating blood cells in laboratory animals. Repeated overexposure has the potential to cause similar toxic effects in humans. EG causes developmental and reproductive effects at high dose levels in laboratory animals. The relevance of these findings to humans is uncertain. However, as a precaution, avoid exposure during pregnancy.

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 for the material, components of the material, or for similar materials, through the application of bridging principals.

ECOTOXICITY

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

MOBILITY

Material -- Expected to remain in water or migrate through soil.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Material -- Expected to be readily biodegradable.

Atmospheric Oxidation:

Material -- Expected to degrade rapidly in air

BIOACCUMULATION POTENTIAL

Material -- Potential to bioaccumulate is low.

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

Even though this product is readily biodegradable, it must not be indiscriminately discarded into the environment. 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



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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)

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Ethylene Glycol)

Hazard Class & Division: 9

ID Number: 3082

Packing Group: III

Product RQ: 5263.16 LBS - ETHYLENE GLYCOL

ERG Number: 171

Label(s): 9

Transport Document Name: UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Ethylene Glycol), 9, PG III, RQ

Footnote: This material is not regulated under 49 CFR when the quantity in a package is less than the Product RQ.

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

Marine Pollutant: No

AIR (IATA): Not Regulated for Air Transport
, EHS

SECTION 15 REGULATORY INFORMATION

CEPA: All components of this product are either on the Domestic Substance List (DSL) or are exempt.

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

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
ETHYLENE GLYCOL	107-21-1	6

--REGULATORY LISTS SEARCHED--

1 = TSCA 4

3 = TSCA 5e

5 = TSCA 12b



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2 = TSCA 5a2

4 = TSCA 6

6 = NPRI

SECTION 16	OTHER INFORMATION
-------------------	--------------------------

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

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):

H302: Harmful if swallowed; Acute Tox Oral, Cat 4

H373: May cause damage to organs through prolonged or repeated exposure; Target Organ, Repeated, Cat 2

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

No revision information

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DGN: 5100044 (1019155)

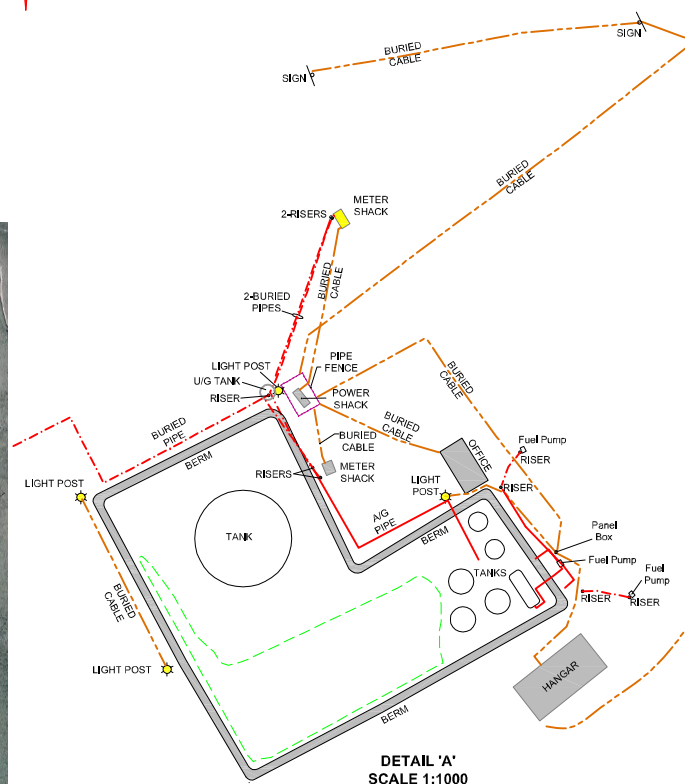
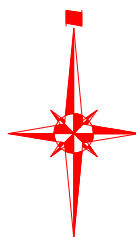
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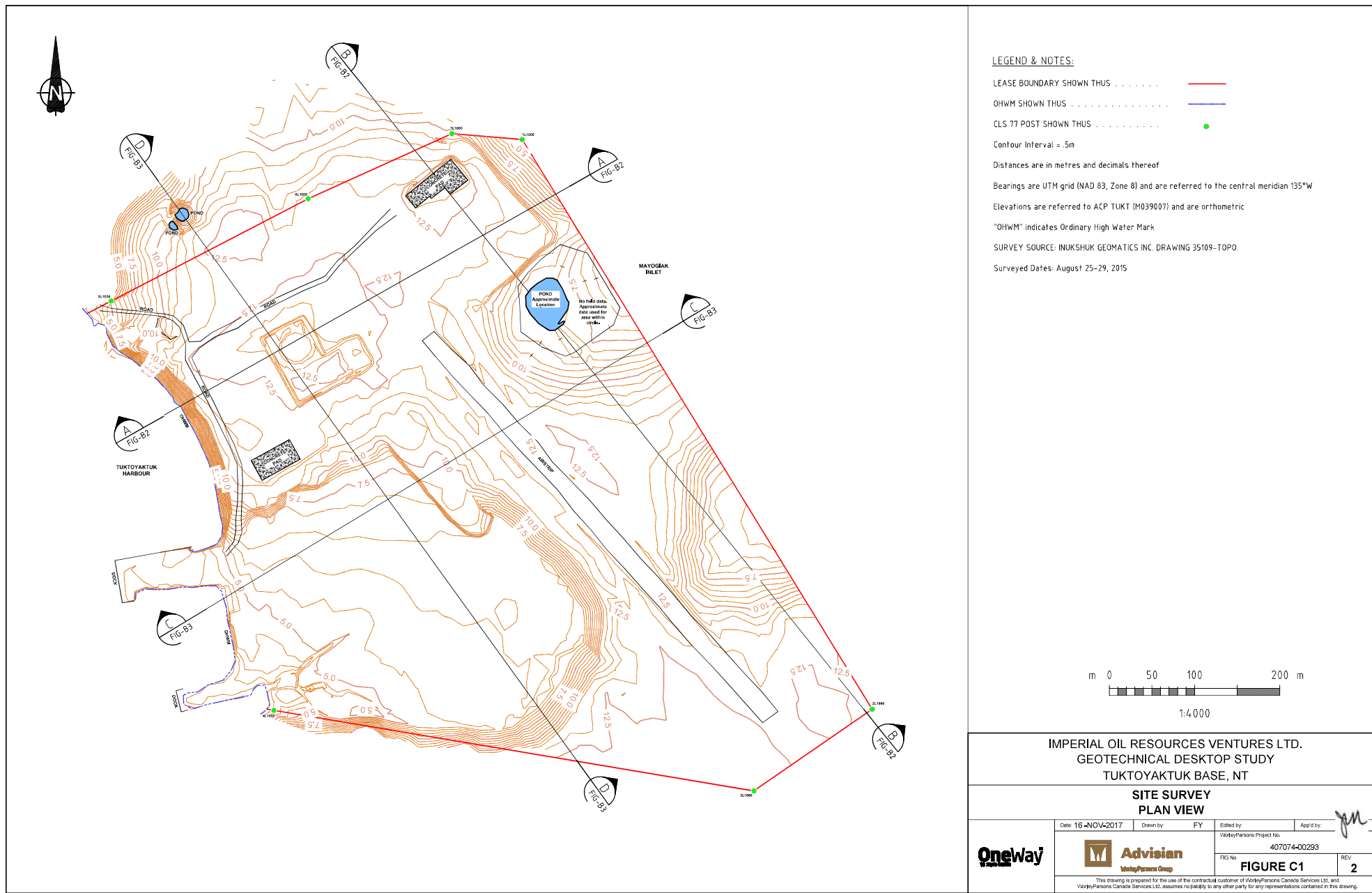
APPENDIX E

Site Survey Plan



PNTs	NORTHING	EASTING	ELEV	DESCRIPTION
1	7704516.58;	578604.365	5.78	TUKT - calc
301	7703376.229	579926.219	4.54	FDMPT 5L1006
302	7703572.62;	580325.919	10.084	FDMPT 7L1006
304	7703496.25;	580157.295	12.253	FDI 6L1006
305	7703565.70;	580408.475	6.623	FDMPT 1L1006
307	7702897.31;	580819.013	11.802	FDMPT 2L1006
307	7702801.59	580680.393	13.019	FDMPT 3L1006
308	7702895.976	580117.054	3.756	FDMPT 4L1006





LEGEND & NOTES:

LEASE BOUNDARY SHOWN THUS

OHWM SHOWN THUS

CLS 77 POST SHOWN THUS

Contour Interval = .5m

Distances are in metres and decimals thereof

Bearings are UTM grid (NAD 83, Zone 8) and are referred to the central meridian 135°W

Elevations are referred to ACP TUKT (M039007) and are orthometric

"OHWM" indicates Ordinary High Water Mark

SURVEY SOURCE: INUKSHUK GEOMATICS INC. DRAWING 35109-TOPO.

Surveyed Dates: August 25-29, 2015



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GEOTECHNICAL DESKTOP STUDY
TUKTOYAKTUK BASE, NT

SITE SURVEY PLAN VIEW

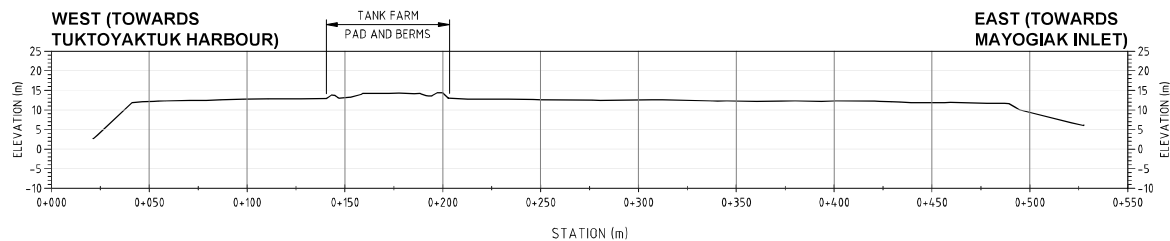
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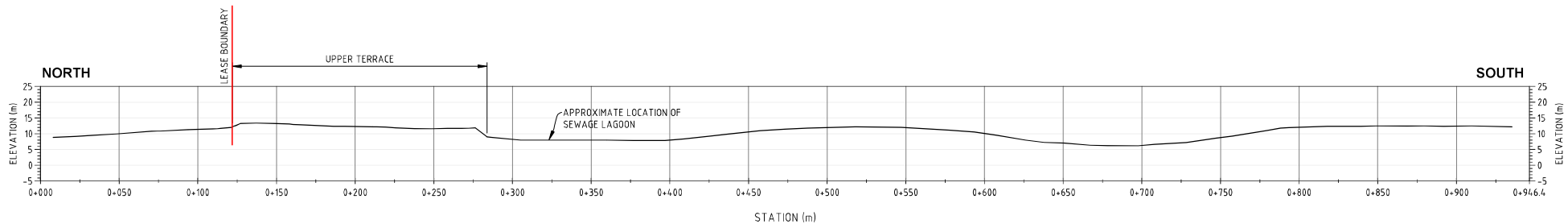
Advisian
WorleyParsons Group

Date: 16-NOV-2017	Drawn by: FY	Edited by:	Appr'd by:
WorleyParsons Project No.		407074-00293	
FIG No.		FIGURE C1	
REV		2	

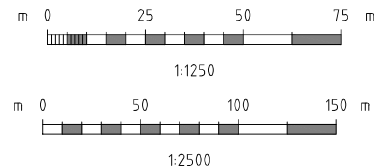
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SECTION **A**
H 2500 V 1250
FIG-B1



SECTION **B**
H 2500 V 1250
FIG-B1



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**SITE SURVEY
CROSS SECTION A & B**

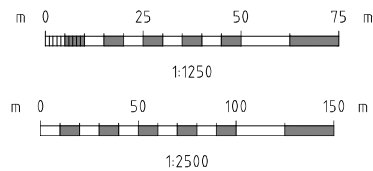
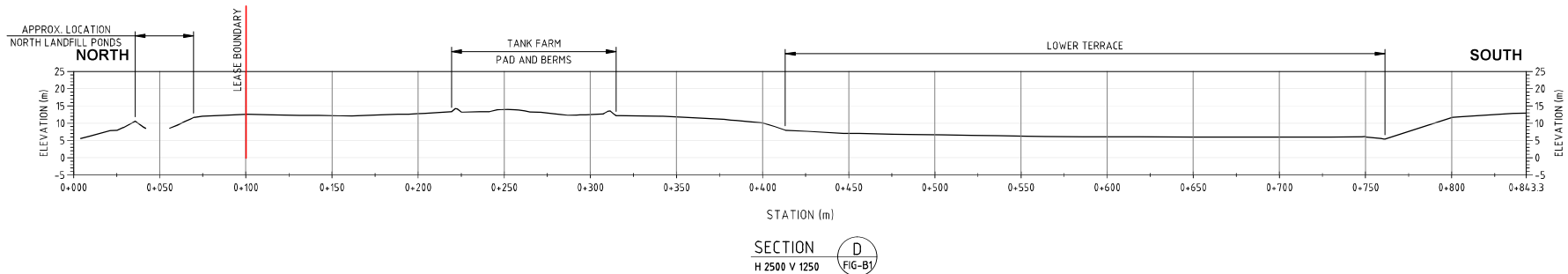
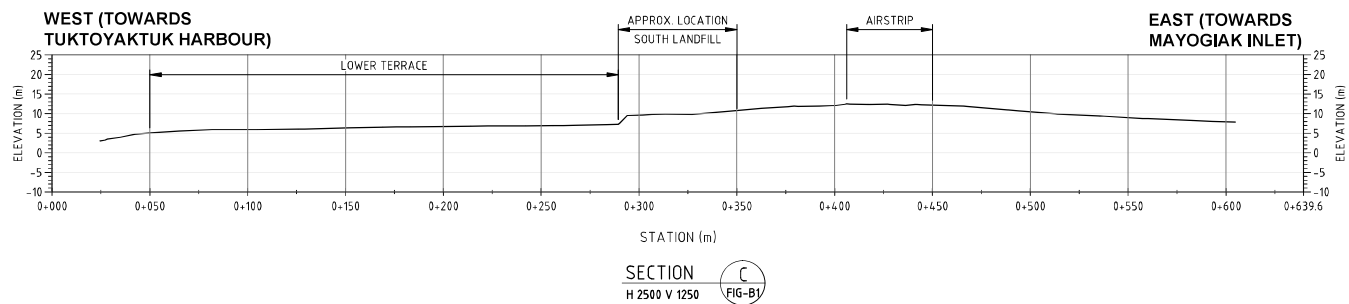
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Advision
WorleyParsons Group

Date: 16-NOV-2017	Drawn by: FY	Edited by:	App'd by: <i>jm</i>
WorleyParsons Project No.		407074-00293	
FIG No.		FIGURE C2	
		REV 2	

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**SITE SURVEY
CROSS SECTION C & D**

OneWay



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Date: 16-NOV-2017	Drawn by: FY	Edited by:	Appr'd by: <i>jm</i>
WorleyParsons Project No.		407074-00293	
FIG No.		FIGURE C3	
		REV 2	

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