BACK RIVER PROJECT
Spill Contingency Plan

October 2017

BACK RIVER PROJECT
SPILL CONTINGENCY PLAN

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Revision Log

Version	Date	Section	Page	Revision
1	October 2017	All	All	Supporting Document for Type A Water Licence Application, submitted to Nunavut Water Board for review and approval

Acronyms

ERAP	Emergency Response Assistance Plan
ERC	Emergency Response Coordinator
ERT	Emergency Response Team
FEIS	Final Environmental Impact Statement
HMMP	Hazardous Materials Management Plan
INAC	Indigenous and Northern Affairs Canada
KIA	Kitikmeot Inuit Association
MAD	Main Application Document
MLA	Marine Laydown Area
NWB	Nunavut Water Board
NWT	Northwest Territories
OHF	Oil Handling Facility
OPEP	Oil Pollution Emergency Plan
PPE	Personal Protective Equipment
Project	Back River Project
RMERP	Risk Management and Emergency Response Plan
Sabina	Sabina Gold & Silver Corp.
SDS	Safety Data Sheet
SCP or Plan	Spill Contingency Plan
SPOEP	Shipboard Oil Pollution Emergency Plan
STP	Sewage Treatment Plant
TDGR	Transportation of Dangerous Goods Regulations
TSF	Tailings Storage Facility
WIR	Winter Ice Road

1. Introduction

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) within the West Kitikmeot region of southwestern Nunavut. It is situated approximately 400 kilometres (km) southwest of Cambridge Bay, 95 km southeast of the southern end of Bathurst Inlet (Kingaok), and 520 km northeast of Yellowknife, Northwest Territories. The Project is located predominantly within the Queen Maud Gulf Watershed (Nunavut Water Regulations, Schedule 4).

The Project is comprised of two main areas with interconnecting winter ice roads (WIR) (Main Application Document [MAD] Appendix A, base Figure 2): Goose Property (MAD Appendix A, base Figure 3) and the Marine Laydown Area (MLA) (MAD Appendix A, base Figure 4) situated along the western shore of southern Bathurst Inlet. The majority of annual resupply will be completed using the MLA, and an approximately 160 km long WIR will interconnect these sites. Refer to the MAD Appendix A, base Figures 1 to 5 for general site layout and locations. A detailed project description is provided in the MAD.

This Spill Contingency Plan (SCP or Plan) outlines the spill prevention and response measures that Sabina will implement in responding to hydrocarbon or other contaminant spill incidents that may occur at the Project. The Plan addresses land and freshwater based emergency response and spill scenarios at the MLA in southern Bathurst Inlet, and the Goose Property. Marine response is detailed in the Oil Pollution Emergency Plan (OPEP; Supporting Document [SD]-18). The SCP and other management plans are intended to support the Type A Water Licence Application for the Project.

Borrow pits and quarries are defined by the type of granular material extracted and the method of extraction. Quarries consist of rock material that is typically extracted by digging, cutting, or blasting and yields large stones that may then need to be crushed (INAC 2009). Borrows pits consist of fine grained fill materials, such as sand or clay, which are normally used at a nearby site (INAC 2009).

The Plan was prepared following the requirements of the Supplementary Information Guidelines for Mining and Milling MM3 and Water Works M1, issued by Nunavut Water Board (NWB 2010 a, b) and the Environmental Impact Statement Guidelines issued by the Nunavut Impact Review Board to Sabina (NIRB 2013) and in accordance with best management practices and in conformance with current Federal and Territorial statutory requirements (see Applicable legislation and Guidelines Section 3).

This plan is a living document to be updated upon changes in related regulatory requirements, management reviews, incident investigations, changes to facility operation or maintenance, and environmental monitoring results, best practice updates or other Project specific protocols once construction starts through to Project closure activities. Any updates will be filed with the Annual Report submitted under the Type A Water Licence.

The information presented herein is current as of September 2017. An update will be initiated prior to the start of construction to update the applicable Safety Data Sheets (SDSs) in Appendix A, and emergency contact information in Section 6. The Plan will be reviewed as needed for changes in operation and technology and as directed by the NWB in the Type A Water Licence or other regulatory authorization where appropriate. Completion of the updated Plan will be documented through signatures of the personnel responsible for reviewing, updating, and approving the Plan.

A record will document all significant changes that have been incorporated in the Plan subsequent to the latest review. The record will include the names of the persons who made and approved the change, as well as the date of the approval.

Sabina will maintain a distribution list providing contact details for all parties to receive the Plan including key personnel, contractors, organizations, and external agencies.

2. Scope and Objectives

The Spill Contingency Plan is one of the documents that forms part of Sabina's overall Emergency Response Program for the Project. This plan has been written to meet requirements of a Type A Water Licence and applies to all Sabina projects in the Kitikmeot region.

The scope of this plan focuses on the spill response and environmental protection measures required in the event of a hydrocarbon or other contaminant spill at any of the Project properties and associated infrastructure, including winter ice and all-weather service roads and airstrips. This entails the implementation of response procedures for Project-related spills, releases, or discharges to land, water, ice and snow of the following products:

- Hydrocarbon products including diesel fuel, gasoline, hydraulic oil;
- Soluble solids such as ammonium nitrate prill;
- Liquids such as glycols and paints;
- Tailings or reclaim water;
- Corrosive liquids including sulphuric acid and sodium cyanide;
- Compressed (inert and flammable) gas; and
- Other hazardous substances.

The SCP is designed to protect worker and public safety and minimize potential impacts to the environment in the event of a Project-related spill. This will be achieved through the application of best management practices implemented through predetermined lines of response and plans of action.

This plan is divided into the following components:

- Applicable Legislation and Guidelines (Section 3);
- Roles and Responsibilities (Section 4);
- Training and Emergency Response Exercises (Section 5);
- Emergency Response Team Contact Information (Section 6);
- Planning and Implementation (Section 7);
- General Spill Response (Section 8);
- Spill Reporting (Section 9);
- Adaptive Management (Section 10); and
- Reclamation (Section 11).

2.1 RELATED PLANS AND DOCUMENTS

Documents within the Application for the Type A Water Licence, which support this plan include:

- Risk Management and Emergency Response Plan (SD-15);
- Oil Pollution Emergency Plan (SD-18);
- Fuel Management Plan (SD-16);
- Landfarm Management Plan (SD-12);
- Hazardous Materials Management Plan (SD-13);
- Water Management Plan (SD-05);
- Explosives Management Plan (Final Environmental Impact Statement [FEIS] Volume 10, Chapter 13);
- Occupational Health and Safety Plan (FEIS Volume 10, Chapter 15);
- Shipping Management Plan (FEIS Volume 10, Chapter 15); and
- Shipboard Oil Pollution Emergency Plan (SOPEP; to be provided in the future by Shipping Company).

Additionally, Emergency Response Assistance Plans (ERAPs) will be required for the transport of certain chemicals in accordance with Section 7 of the Transportation of Dangerous Goods Regulations (TDGR). This is discussed further in Sections 8.3.4 and 8.3.5.

Based on the quantity of fuel to be transferred from ship to shore at the MLA, the MLA will be considered an Oil Handling Facility (OHF). This SCP is intended to interface with the OPEP (SD-18) developed for the MLA and the Shipping Management Plan developed for the shipping component of the Project.

2.1.1 Linkage with Sabina Oil Pollution Emergency Plan

The *Response Organizations and Oil Handling Facilities Regulations* under the *Canada Shipping Act* stipulates that operators of designated OHFs must have an on-site OPEP that has been approved by Transport Canada.

The OPEP prepared for the MLA-OHF applies to marine spills that may occur during ship-to-shore fuel transfers. Ship-specific Shipboard Oil Pollution Emergency Plans specifically address marine spill incidents that may be associated with spills from shipping vessels while at sea. The OPEP (SD-18) prepared for the MLA has been designed to complement this plan.

Sabina's Emergency Response Team (ERT) will be trained to adequately handle any emergencies that impact the ocean, land, and freshwater, including implementation of this SCP for land-based spills, and implementation of the OPEP (SD-18) for any spills that may occur during ship-to-shore fuel transfers.

3. Applicable Legislation

Specific legislation, regulations, and guidelines related to spill contingency planning and response in Canada, and specifically within Nunavut, are summarized in Table 3-1. Operational policies and procedures that fulfill conditions in applicable legislation will be further developed as the project proceeds.

Sabina will also be bound by the terms and conditions of its land use permits to be issued by Indigenous and Northern Affairs Canada (INAC) for Crown Lands and the Kitikmeot Inuit Association (KIA) for Inuit Owned Land, and its Type A Water Licence to be issued by the Nunavut Water Board.

Table 3-1. Legislation Applicable to the Spill Contingency Plan

Acts	Regulations	Guidelines
Federal		
Arctic Waters Pollution Prevention Act (R.S.C., 1985, c.A-12)	Arctic Shipping Pollution Prevention Regulations (C.R.C., c. 353)	
Canadian Environmental Protection Act (R.S.C.1999 c.33)	Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (SOR/2008-197) Environmental Emergency Regulations (SOR/2003-307) Interprovincial Movement of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2002-301) Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149)	Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (Canadian Council of the Ministers of Environment (CCME) 2003) Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil (CCME 2008)
Fisheries Act (1985, c.F-14)	Metal Mining Effluent Regulations (SOR/2002-2222)	
Explosives Act (1985, c.E-17)	Ammonium Nitrate and Fuel Oil Order (C.R.C., c.598) Explosives Regulations (C.R.C., c.1516)	
Nunavut Waters and Nunavut Surface Rights Tribunal Act (2002)	Nunavut Water Regulations (2013)	
National Fire Code of Canada (2010)		
Transportation of Dangerous Goods Act (1992, C.34)	Transportation of Dangerous Goods Regulations (SOR/2001-286)	2016 Emergency Response Guidebook (Transport Canada and U.S. Department of Transportation, 2016)
Territorial Lands Act (R. S. 1985, c.T-7)	Northwest Territories and Nunavut Mining Regulations (C.R.C., c.1516) Territorial Land Use Regulations (C.R.C., c.1524) Territorial Lands Regulations (C.R.C., c. 1525)	

(continued)

Table 3-1. Legislation Applicable to the Spill Contingency Plan (completed)

Acts	Regulations	Guidelines
Hazardous Products Act *Nunavut Act* (1993 c.28)	*Controlled Products Regulations*	*Workplace Hazardous Materials Information System (WHMIS)*
Territorial – Nunavut		
Environmental Protection Act	Spill Contingency Planning and Reporting Regulations (NWT Reg (Nu) 068-93) Used Oil and Waste Fuel Management Regulations (NWT Reg 064-2003) The removal of hazardous materials will require the registration with the Government of Nunavut, Department of Environment (DOE) as a waste generator as well as carrier (if applicable) prior to transport	Government of Nunavut (GN) Environmental Guidelines for the Management of: o General Management of Hazardous Waste in Nunavut (GN, 2010a) o Waste Paint (GN, 2010b) o Mercury-Containing Products and Waste Mercury (GN, 2010c) o Industrial Waste Discharges into Municipal Solid Waste and Sewage Disposal Facilities (GN, 2011a) o Waste Batteries (GN, 2011b) o Waste Solvent (GN, 2011c) o Waste Antifreeze (GN, 2011d) o Used Oil and Waste Fuel (GN, 2012) o Biomedical and Pharmaceutical Waste (GN, 2014) Canada-Wide Standards for Petroleum Hydrocarbons (PHC) In Soil (CCME 2008)
Mine Health and Safety Act (SNWT (Nu) 1994, c.25)	Mine Health and Safety Regulations (NWT Reg (Nu) 125-95)	
Workers' Compensation Act (RSNWT, 1998, c.W-6)	Workers' Compensation General Regulations (Nu Reg 017-2010)	
Explosives Use Act (RSNWT (Nu) 1988, c.E-10)	Explosives Regulations (RRNWT (Nu) 1990, c.E-27)	
Fire Prevention Act (RSNWT (Nu) 1988, c.F-6)	Fire Prevention Regulations (RRNWT (Nu) 1990, c.F-12)	
Motor Vehicles Act (RSNWT (Nu) 1988, c.M-16)	Large Vehicle Control Regulations (RRNWT (Nu) 1990, c.M-30)	
Public Health Act (RSNWT (Nu) 1988, c.P12)	Camp Sanitation Regulations (RRNWT (Nu) 1990, c.P-12)	
Safety Act (RSNWT 1988, c.S-1)	General Safety Regulations (RRNWT (Nu) 1990, c.P-16) Work Site Hazardous Materials Information System Regulations (RSNWT 1988, c.81 (Supp))	
Transportation of Dangerous Goods Act (1990, RSNWT (Nu) 1988, c.81 (Supp))	Transportation of Dangerous Goods Regulations (1991, NWT Reg (Nu) 095-91)	

4. Roles and Responsibilities

The initial stage of any spill incident and resultant response is critical. An effective and timely initial response is essential to preventing a spill situation from escalating. Therefore, all relevant personnel must be fully aware of their individual duties and responsibilities as presented in this plan. It is the duty of any individual who encounters a spill to notify Incident Commander immediately upon encountering a spill.

Figure 4-1 summarizes Sabina's generalized emergency and spill response organization chart. This organization chart is also presented in the Risk Management and Emergency Response Plan (RMERP; SD-15), as well as the OPEP (SD-18).

The specific responsibilities and duties of personnel involved in emergency and spill response are outlined in Sections 4.1 to 4.9. In the SCP, all spills are emergencies. The severity of the spill will determine the level of response and participation of the ERT members.

Contractors will be required under specific contractual clauses, to comply with Sabina's approvals and environmental management plans, including this SCP. Sabina staff will monitor contractor performance and adherence to legislation and the commitments in the environmental management plans.

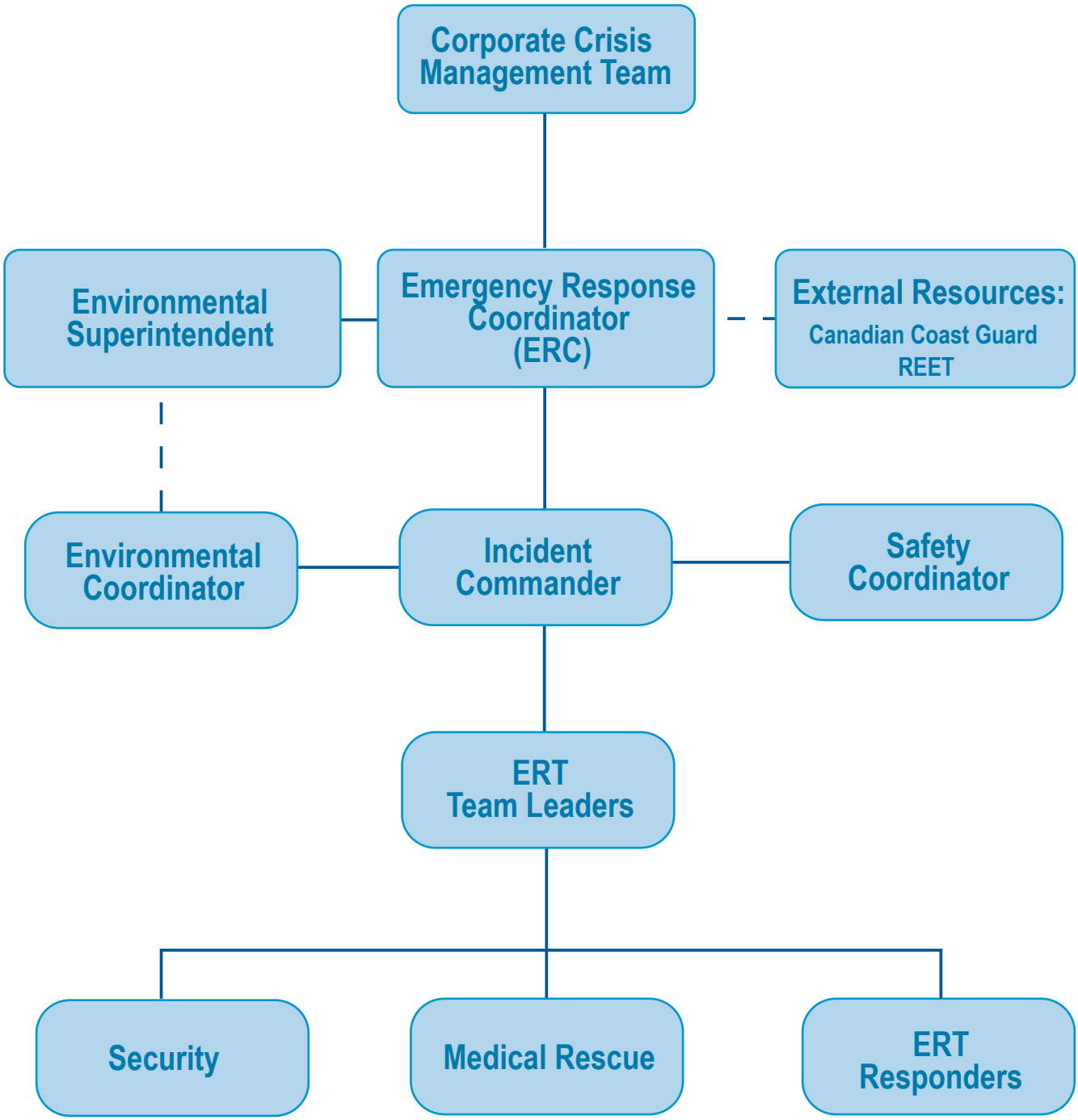

Figure 4-1

Sabina Spill Response Organization Chart

Sabina GOLD & SILVER CORP.

4.1 EMERGENCY RESPONSE COORDINATOR

The Emergency Response Coordinator (ERC) is the General Manager or his designate if absent. ERC duties during an emergency are detailed as follows:

- The ERC will ensure coordination of ERT support systems.
- Upon being notified of an emergency, the ERC will initiate response activities and assess the situation based on current information from the Incident Commander.
- Activate the emergency response process and escalate according to severity of incident.
- The ERC will coordinate all activities. In the event the ERC leaves his post, the ERC will designate an individual to coordinate in his absence.
- Ensure that the appropriate area manager/s has been notified.
- Provide internal notification as applicable based on the level of emergency.
- Provide instruction to ensure that appropriate external resources are notified.
- Receive information from the Incident Commander and ensure appropriate resources are made available.
- Provide support for the acquirement of additional supplies and resources as requested by the Incident Commander.
- Contact departmental resources via radio as required during the emergency response.
- Provide internal notification of the “all clear”.
- Ensure the coordination and establishment of an emergency debriefing session.
- Review incident log and post response incident report.
- Post incident debrief with Incident Commander.
- Provide necessary information to Public Relations for a media statement release if required.
- Complete a report on the events surrounding the incident.
- Coordinate collection of all incident notes, reports, statements and log of events.
- End the event in a project tracking system.
- Post incident: review the recommended measures to prevent a recurrence of the spill and implement the corrective actions.

4.2 ENVIRONMENT SUPERINTENDENT

The duties of the Environment Superintendent during a spill emergency are detailed as follows:

- For major spills contact the ERC and report to the command center.
- Assist the ERC in evaluating the initial situation and assessing the magnitude of the spill.
- Report the spill to NWT-NU 24-hour Spill Report Line and the KIA depending on whether threshold volume is triggered.
- Assist in developing an overall plan of action.
- Document all actions and decisions.

- Complete Government Agency notification processes.
- Act as the spokesperson with government agencies as appropriate.
- Collect photographic records of the spill event and cleanup efforts.
- Report to the ERC and provide recommendations on resource requirements (additional manpower, equipment, material) to complete the cleanup effort.
- Provide liaison with management to keep them informed of cleanup activities.
- Ensure that the spill is cleaned up and follow-up communication and reports are filed with the INAC and KIA.
- Assist in the accident/incident investigation process.
- Participate in post-emergency debriefing.
- Ensure that all involved departments complete reporting process.
- Ensure that spill reports submitted to INAC and KIA include photographic records and an updated map showing Universal Transverse Mercator (UTM) coordinates, date, and amount and nature of the spill.
- Implement a sampling procedure for the collection and analysis of samples to identify and monitor possible contaminant levels resulting from the spill.
- Document the cause of the spill, effectiveness of the cleanup effort, and recommend the appropriate measures to prevent a recurrence of the spill.
- Prepare and submit follow-up documentation required by appropriate regulators.

For marine spills at the OHF, the Environment Superintendent will be available to the Canadian Coast Guard during the entire incident.

4.3 INCIDENT COMMANDER

The Incident Commander is the site lead administrator for the ERT, responsible for ensuring the necessary emergency response equipment and adequate level of training for ERT members. The Incident Commander directs the ERT at the scene as ERT Leader. In the absence of the Incident Commander, a senior team member will be designated in his place.

The duties of the Incident Commander during an emergency are:

- Muster accordingly and brief team members.
- Report to the scene of the emergency.
- Take charge of the scene.
- Evaluate the details of the emergency as presented by those on scene.
- Assess the immediate situation, confirm the level of emergency and notify the ERC.
- Maintain contact with the ERC and provide support in coordination of the response.
- Direct ERT members in their respective tasks as required.
- Contact departmental resources via radio as required during the emergency response.
- Request internal/external resources as required.

- Advise ERT on aspects of internal/external support as they are received.
- Develop a written log of events indicating instructions given, action taken and outcomes achieved.
- Announce the 'all clear' to the ERC when the emergency has ended.
- Lead the post-emergency debriefing session.
- Ensure that all ERT equipment is returned to original order and/or replaced to ensure future rapid response.
- Provide assistance with ongoing investigation.
- Prepare a written report on response activities.

4.4 EMERGENCY MEDICAL PERSONNEL

Duties during an emergency are as follows:

- Respond when required as directed by the Incident Commander.
- Responsible for all decisions of medical-related situations on-site.
- Responsible for assessing, administering and delegating emergency medical care.
- Advise the Incident Commander of the number and condition of any ill/injured personnel.
- Advise the ER Coordinator of off-site resources required.
- Maintain a log of events, actions and outcomes.
- Participate in a post-emergency debriefing session.

4.5 COMMUNICATIONS OFFICER

The Communications Officer manages the collection and dissemination of all information relating to an emergency, including:

- Government agencies, including those that may be involved in responding to any emergency;
- Communities (Hamlets, community groups and individuals); and
- Media.

The Communications Officer will be part of the Corporate Crisis Management Team identified on Figure 4-1, and will likely be a corporate executive such as the Vice President, Environment & Sustainability, or a designate.

If required, the Communications Officer or designate will control radio use and restrict it to emergency response only. The Communications Officer will also direct the collection, collation and management of all written information, photographs, drawings and video recordings generated during the emergency. This includes the following records:

- A record of the chronology of events.
- Log of telephone calls.
- Log of written statements regarding the emergency (emails, press releases, etc.).

- A list of personnel on-site at the time of the emergency along with emergency contact information.

All other communications of an emergency by other project personnel will be prohibited, to limit possible uncontrolled dissemination of misinformation.

4.6 SECURITY

Security personnel or designates will receive the initial notification of an emergency and provide first communications to essential personnel and secure the area.

Duties during an emergency are as follows:

- Security will report muster and evacuation status to the Incident Commander and await further instruction.
- Provide traffic and personnel control at the scene as directed by the Incident Commander.
- Assist in controlling access to the emergency area.
- Maintain open radio communication (via radio or telephone intercom system).
- Keep a written record of events throughout the incident.
- Relay notification of 'all clear" order when directed by the Incident Commander.
- Maintain Security of the scene as directed by the ERC or Incident Commander.
- Direct all off-site inquiries regarding the emergency to the ERC or designate.
- Participate in a debriefing session for the emergency response.

4.7 ENVIRONMENTAL COORDINATOR

The Environmental Coordinator will liaise with the Incident Commander to advise on the required environmental response efforts once the scene has been assessed by the Incident Commander and all medical and/or fire emergencies are under control.

The Environmental Coordinator will:

- Directly proceed to the scene of the incident.
- Make recommendations for response methods and resources based on area sensitivities and incident severity through the Incident Commander as necessary.
- Make recommendations for additional resources through the Incident Commander as necessary.
- Participate in post-emergency debriefing.
- Maintain a log of events, actions, and outcomes.

4.8 SAFETY COORDINATOR

The duties of the Safety Coordinator during an emergency are detailed as follows:

- Contact the ERC.
- Respond to the scene and make direct contact with the Incident Commander.

- Establish perimeters around the area of the emergency and direct appropriate resource personnel responsible for traffic flow.
- Assist with identifying and assessment of potential hazards of the ERT response and notify the Incident Commander.
- Ensure appropriate personal protective equipment for involved ERT and non ERT personnel.
- Note pertinent information that may be relative to the investigation.
- Secure the area in coordination with site security.
- Participate in post-emergency debriefing.
- Assist in the accident/incident investigation and complete report.

4.9 TEAM LEADERS – (EMERGENCY RESPONSE TEAM)

The duties of the Team Leaders during an emergency are detailed as follows:

- Report to the scene of the incident.
- Work closely with the Incident Commander to determine appropriate response strategy for their respective work area.
- Contact departmental resources via radio as required during the emergency response.
- Direct ERT members in their respective tasks as required.
- Participate in a post-emergency debriefing session.

5. Training and Emergency Response Exercises

5.1 GENERAL

Training and awareness are two major elements of spill prevention. All site staff and contractors will review the contents of the SCP during their on-site orientation and will be informed of where copies of the Plan are stored. The mandatory site orientation will provide hazard awareness training, identify the locations of spill kits and other response equipment, and discuss appropriate application. A more detailed description of the training to be provided to site staff is provided in Section 7 of this plan.

Sabina will ensure that relevant personnel involved in a response have received prior training and the requisite skills to safely minimize the impact of a spill to the environment.

The personnel directly linked to emergency response operations will receive training to familiarize themselves with the content of the SCP and the RMERP on a regular basis according to their duties and responsibilities. All completed training will be recorded in a training register, to be kept up to date by the ERT. Training will be conducted to ensure adequate numbers of responders are available for all levels, times, and work shifts.

All training conducted will be documented in a training register that will include participants names, dates and copies of any training materials provided. The register will be kept up to date by the ERT. The training regime will be reviewed at a minimum annually but additionally when there is a change in operations, chemicals or hazard information.

5.2 SITE ORIENTATION

Site orientation will be provided to all personnel to ensure employees are aware of:

- The RMERP (SD-15), Explosives Management Plan (FEIS Volume 10, Chapter 13), SCP (SD-17), OPEP (SD-18), and Fire Action Plan.
- Applicable Legislation.
- Environmental Receptors (i.e., surface water and sensitive areas).
- What First Responders are to do in case of a spill.
- The location of SDS sheets and Spill Report Forms.
- The location of the Spill Response Kits.
- The general locations of fire extinguishers and firefighting equipment.
- The location of the SCP and the Fire Action Plan.

5.3 ROLE SPECIFIC

Specific spill response training will be provided to those employees whose job function may have a higher probability of experiencing a spill, such as those handling chemicals, to ensure those individuals have appropriate knowledge and skills related to:

- Workplace Hazardous Materials Information Systems and TDGR training.
- Specialized handling and emergency/spill response procedures related to specific chemicals (e.g., explosives, cyanide, fuel) to minimize the risk of spills.
- Identify and avoid the conditions which may lead to a spill.
- Develop an understanding of the potential environmental impacts of a spill.
- Recognize the hazards associated with sources of ignition (smoking, electrical sparks) near a fuel source.
- Spill kit contents and appropriate use.

For employees involved in fuel handling, additional training will be provided regarding appropriate refuelling techniques and drum handling procedures. Personnel not trained to handle chemical spills will not attempt to clean up spills; they are to contact emergency response personnel for clean-up assistance. Medical staff potentially involved in supporting response workers will receive role-specific training including information on the details of the Plan and SDSs.

5.4 EMERGENCY RESPONSE TEAM

Members of the ERT will be provided a higher level of training to allow for safe and adequate response. The ERT members will receive 8 hours of training during each two-month period, or as prescribed by the *Mines Act*. ERT training includes:

- Information provided as part of the Role-Specific Training.
- First Aid training.
- Fire extinguishers and water pump locations and use.
- Details of the SCP and the Fire Action Plan.
- How to identify, evaluate and mitigate the hazards posed by any spilled product by using appropriate personal protective equipment (PPE).

5.5 SPILL RESPONSE EXERCISES

Spill response exercises will be conducted to validate on-site capabilities, practice the internal and external notification processes and evaluate the management of the response through the decisions and actions of the spill management team participating in the exercise(s).

The exercises will involve the application of realistic hands-on scenarios where the ERT will deploy the appropriate equipment to respond to the specific spill scenario developed for the exercise. The spill exercise may be broken down into two or more sessions to ensure adequate coverage. Records of all spill response exercises will be kept on file and posted to provide access for those who were unable to attend.

6. Emergency Response Team Contact Information

Contact information for all Sabina Staff members involved in spill response is presented in Table 6-1. Contact information for Project contractors will be updated and presented in Table 6-2 when they become available. External contacts that may provide additional assistance as necessary are presented in Table 6-3. Key government contacts are provided in Table 6-4. These contacts will be reviewed and updated with every review of the SCP.

Table 6-1. Emergency Response Management Team

Title	Contact Name	Telephone No.
Emergency Response Coordinator	TBD	TBD
Environmental Superintendent	TBD	TBD
Incident Commander	TBD	TBD
Environmental Coordinator	TBD	TBD
Safety Coordinator	TBD	TBD
Operations Superintendent	TBD	TBD
Emergency Medical Personnel	TBD	TBD
Team Leaders	TBD	TBD
Communications Officer	TBD	TBD

Table 6-2. Contractor Contacts

Title	Telephone No.
TBD	TBD
TBD	TBD
TBD	TBD

Table 6-3. External Spill Response Contacts

Expediting Company	Contact Name	Telephone No.
Fuel Supplier, Mobile Environmental Response	TBD	TBD
Kitnuna	TBD	(867) 983-2331
Nuna Logistics Ltd.	TBD	(867) 682-4667
DuPont (Fuel Dye)	TBD	(905) 821-5660
Frontier Mining (Sorbents)	TBD	(867) 920-7617
Acklands (Sorbents)	TBD	(867) 873-4100
Canadian Coast Guard*	TBD	Phone: (800) 265-0237

** Refer to the OPEP (SD-18) for oil spill response in the marine environment.*

Table 6-4. Key Government Contacts

Agency/Organization	Contact Name	Telephone/Fax No.
NWT/NU 24hr Spill Report Line		Phone: (867) 920-8130 Fax: (867) 873-6924 Email: spills@gov.nt.ca
Indigenous and Northern Affairs Canada	Water Resources Officer Resource Mgmt. Officer A/Manager of Field Ops	Phone: (867) 669-2438 Phone: (867) 975-4296 Phone: (867) 975-4295
Canadian Coast Guard (in the event of a spill to the marine environment)		Phone: (800) 265-0237
Department of Fisheries and Oceans	fisheriesprotection@dfo-mpo.gc.ca	Phone: 1 (855) 852-8320
Environment Canada	Manager of Enforcement NWT/NU 24hour Spill Report Line	Phone: (867) 669-4730 Phone: (867) 920-8130
Government of Nunavut Environmental Protection	Director Environment	Phone: (867) 979-7800
Kitikmeot Inuit Association (KIA)	Lands Inspector	Phone: (867) 982-3310 x223
Nunavut Water Board	Exec. Director Manager of Licensing	Phone: (867) 360-6338 Phone: (867) 360-6338
RCMP (Kugluktuk)		Phone: (867) 982-2111
RCMP (Yellowknife)		Phone: (867) 669-1111
Workers Safety and Compensation Commission	Chief Inspector of Mines	Phone: (867) 669-4430 Fax: (867) 873-6924

7. Planning and Implementation

Planning for the SCP started with the development of the Draft Environmental Impact Statement which identified existing (baseline) conditions, assessed potential impacts of the Project, developed conceptual mitigation strategies, and developed specific mitigation measures to execute these strategies. Conceptual strategies and plans have advanced with FEIS and will continue to be elaborated and executed throughout the Construction, Operations, and Closure phases of mining. Environmental management will be tracked, reviewed, and updated through ongoing maintenance of the Plan. These updates will incorporate relevant feedback from the public, obtained during public consultation.

7.1 DEFINITIONS AND SPILL QUANTITIES

For the purpose of this plan, a **major spill** is defined as an accidental release of product into the environment that has the potential for significant adverse impact and is a reportable quantity.

A **minor spill** is defined as any hazardous chemical spill that does not involve highly toxic, highly reactive, or explosive chemicals, in a situation that is not life threatening, nor poses immediate risk to the receiving environment. Furthermore, this type of spill presents a manageable physical or health hazard to personnel who, when wearing proper PPE, will not be exposed to any chemical at a level that exceeds any recognized action levels or permissible exposure limits.

Minimum reportable thresholds are provided by:

- Guidelines for Spill Contingency Planning, Appendix B-3: Immediately Reportable Spill Quantities (AANDC 2010).
- Transportation of Dangerous Goods Regulations – Part 8 – Accidental Release and Imminent Accidental Release Reporting Requirements.

The SCP is activated based on the lowest minimal reportable thresholds as shown in Table 7.1-1.

If a spill on-site meets or exceeds the minimum reportable thresholds, or is thought to exceed the minimum reportable thresholds, the spill will be reported by the Environmental Superintendent (or designate) to the **NWT-NU 24-Hour Spill Report Line**. All spills of fuel or hazardous materials into a waterbody or ice will be reported to the Spill Report Line, to ensure compliance with the *Fisheries Act*.

Accidental releases of runoff from mining areas not conforming to facility designs (e.g., tailings supernatant, WRSA runoff from ponds, etc.), and from lined containment areas (i.e., tank farm berms) will be reported as “other contaminants” in Table 7.1-1.

Additional direction on the reporting of spills, including also TDGR requirements for reporting of spills of dangerous goods in transit, is provided in Section 9.2.

Procedures will be developed and implemented to require all non-reportable spills to be communicated by staff and responded to as needed.

Table 7.1-1. Externally Reportable Volumes (AANDC 2010, TDGR)

TDGA Class	Description of Contaminant	Amount Spilled
1	Explosives	Any amount
2.1	Compressed gas (flammable)	Any amount of gas from containers with a capacity greater than 100 litres
2.2	Compressed gas (non-corrosive, non-flammable)	Any amount of gas from containers with a capacity greater than 100 litres
2.3	Compressed gas (toxic)	Any amount
2.4	Compressed gas (corrosive)	Any amount
3.1, 3.2, 3.3	Flammable liquid (hydrocarbon fuels)	100 litres
4.1	Flammable solid	25 kg
4.2	Spontaneously combustible solids	25 kg
4.3	Water reactant solids	25 kg
5.1	Oxidizing substances	50 litres or 50 kg
5.2	Organic peroxides	1 litre or 1 kg
6.1	Poisonous substances	5 litres or 5 kg
6.2	Infectious substances	Any amount
7	Radioactive	Any amount
8	Corrosive substances	5 litres or 5 kg
9.1 (in part)	Miscellaneous products or substances, excluding PCB mixtures	50 litres or 50 kg
9.1 (in part)	PCB mixtures of 5 or more parts per million	0. 5 litres or 0. 5 kg
9.2	Environmentally hazardous	1 litre or 1 kg
9.3	Dangerous wastes	5 litres or 5 kg
None	Other contaminants	100 litres or 100 kg

7.2 INVENTORY OF FACILITIES

Facilities on-site for the storage of chemical, hazardous material and/or fuel at the MLA includes:

- Landfarm;
- Lined Hazardous Materials Management Area;
- Freight Storage Area; and
- Fuel Storage Area (4 x 15 ML tanks).

Refer to Figure 7.2-1 for the MLA facility arrangement.

Facilities on-site for the storage of chemical, hazardous material and/or fuel at the Goose Property includes:

- AN Storage and AN Facility;
- Process Plant;
- Power Plant;

- Truck Shop/Dry Warehouse;
- Freight Storage;
- Fuel Unloading and Dispensing
- Laydown Storage;
- Haul Truck Fueling Station;
- Waste Oil Storage;
- Lined Hazardous Materials Management Area;
- Fuel Storage (3 x 15 ML tanks); and
- Landfarm.

Refer to Figure 7.2-2 and 7.2-3 for Goose Property facility arrangement. For spill response equipment inventory refer to Section 7.5.

As Project planning and design progresses, more detail of specific products and expected amounts will be included in this plan. A revised inventory of facilities and products quantities will be provided 60 days prior to construction and when needed to account for changes in operation and technology and as directed by the NWB in the Type A Water Licence or other regulatory authorization where appropriate.

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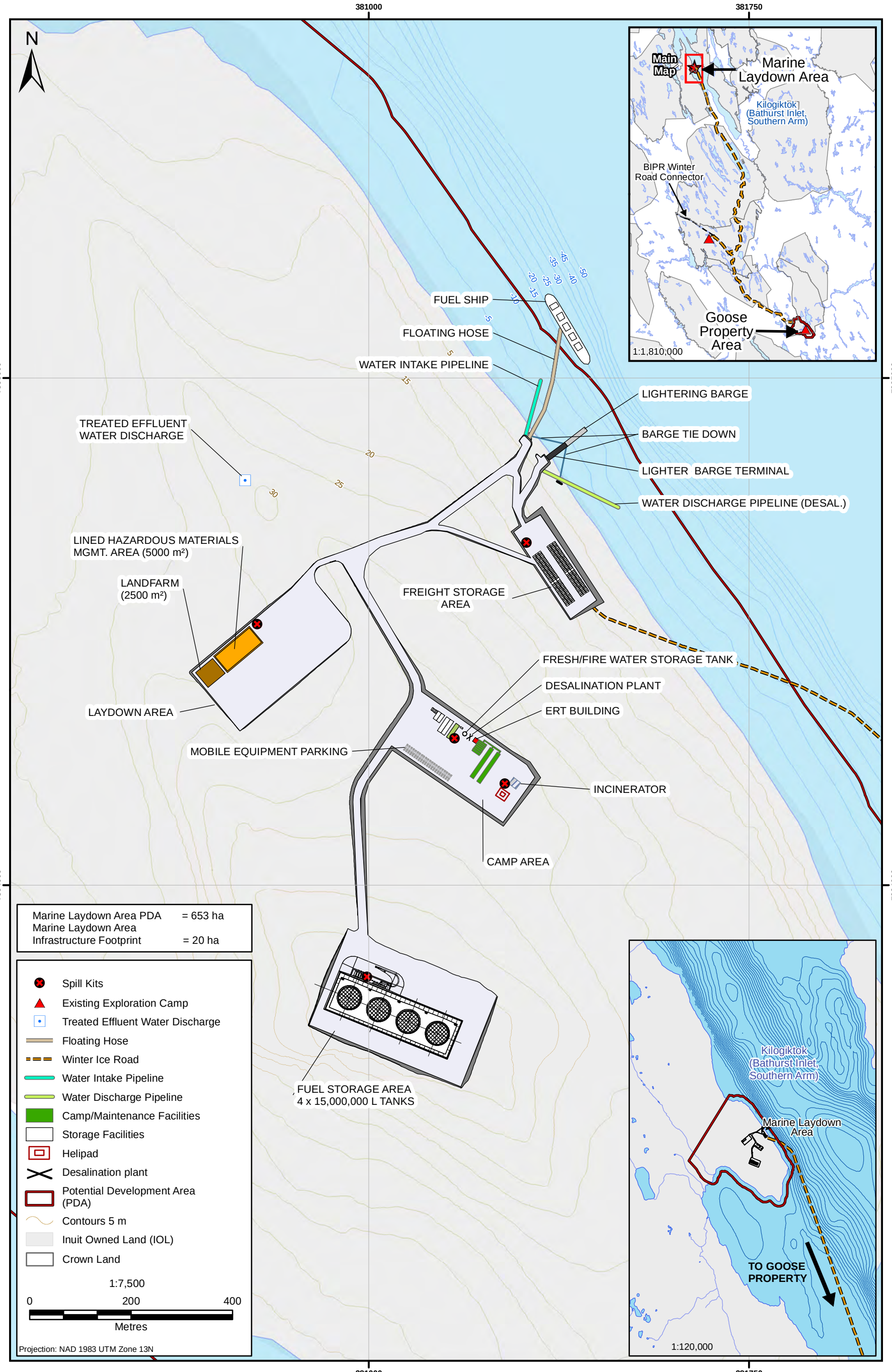
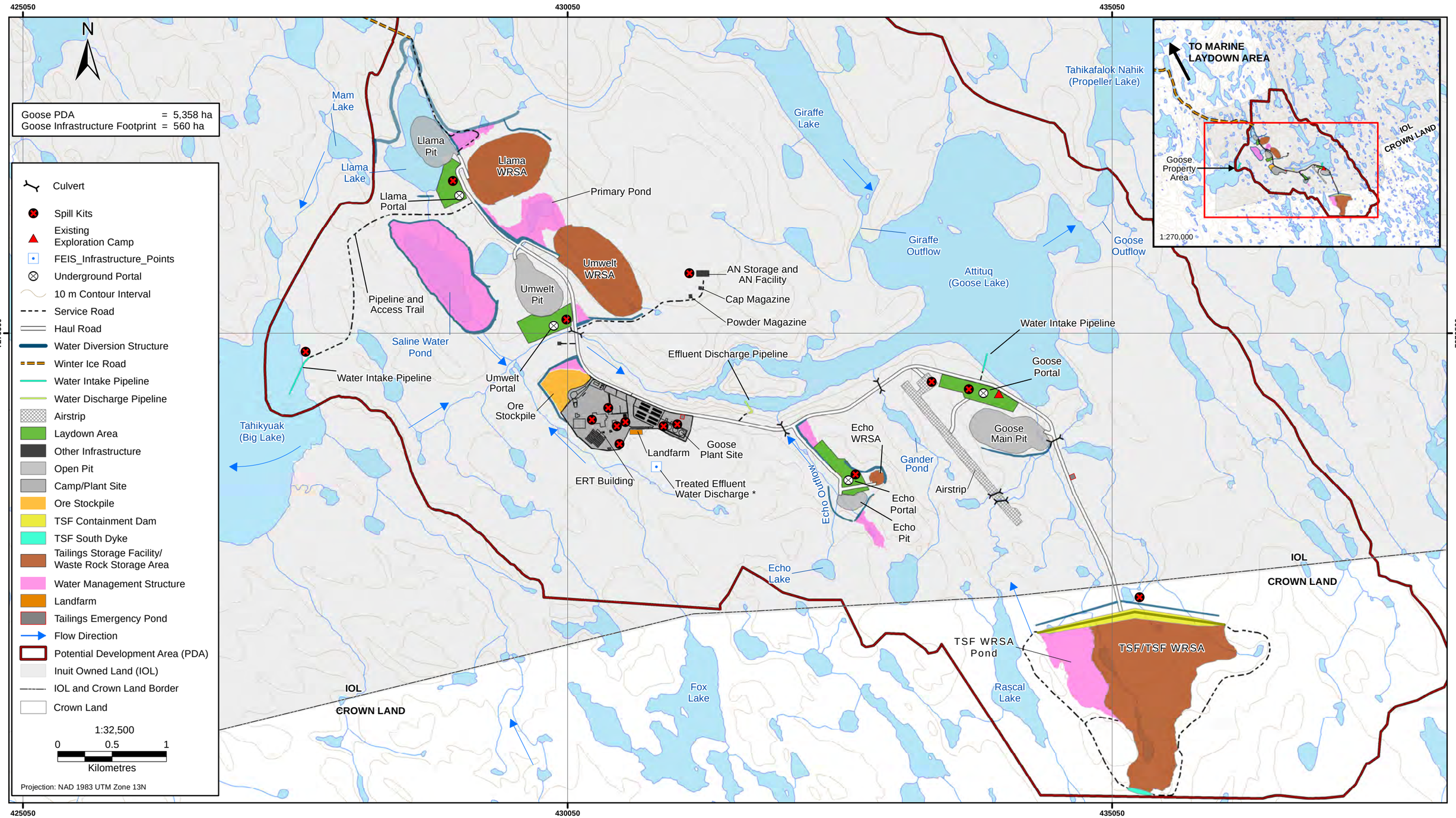


NOTE: All roads at the MLA are service roads

Figure 7.2-1

Sabina GOLD & SILVER CORP.

Marine Laydown Area
General Arrangement Plan with **Spill Kit** Locations



Sabina GOLD & SILVER CORP.

Goose Property
General Arrangement with Spill Kit Locations
Type A Water Licence

Figure 7.2-2

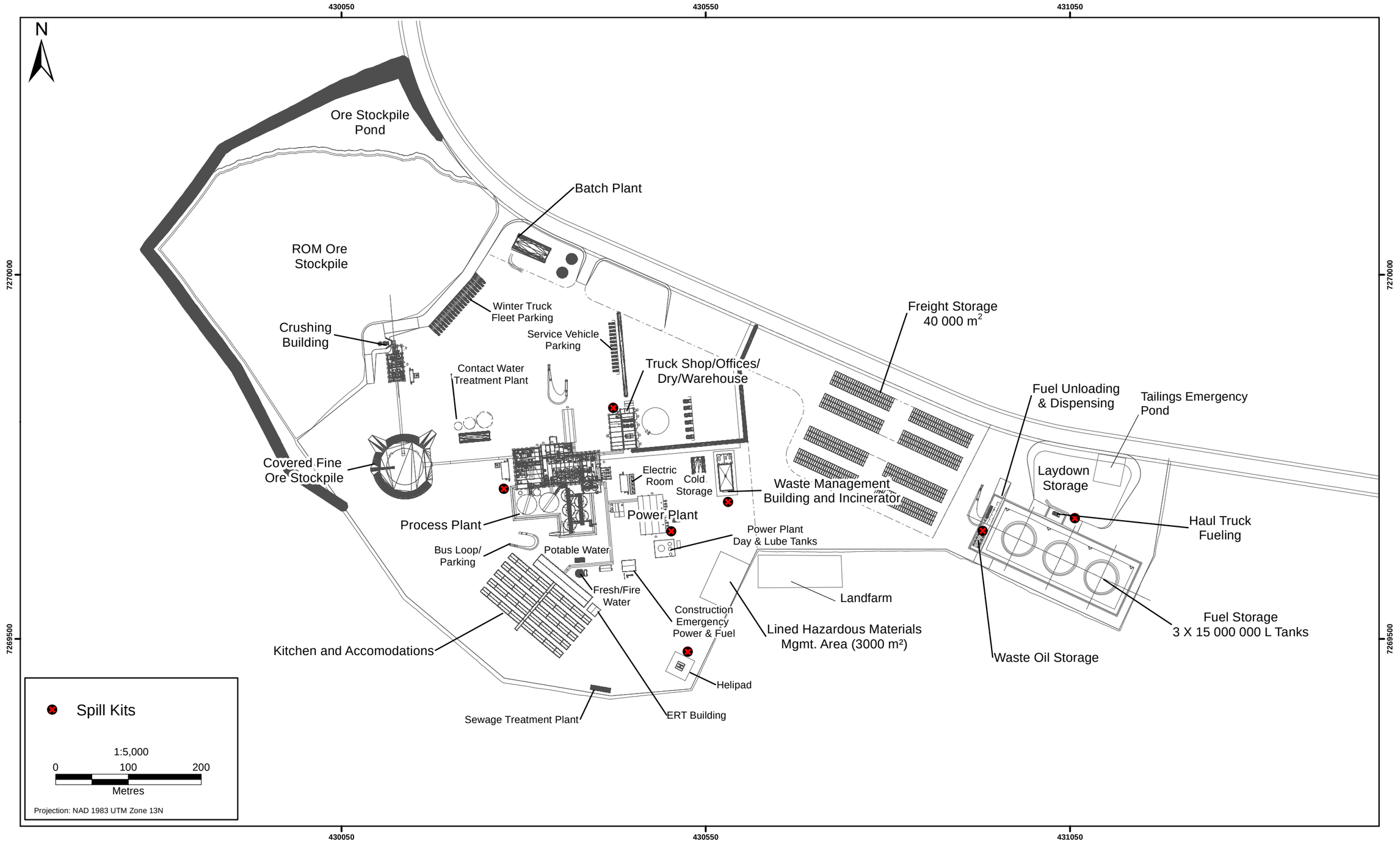


Figure 7.2-3

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Goose Plant Site Layout with Spill Kit Locations
Type A Water Licence

7.3 HAZARDOUS MATERIALS ON-SITE

A number of hazardous materials are anticipated to be stored on-site during all stages of construction and operations. The specific materials and quantities of hazardous materials being stored at one time will vary depending on the Project stage. A list of the main hazardous materials to be transported to and stored on-site is provided within the Hazardous Materials Management Plan (HMMP; SD-13) and in Appendix B of this plan. As Project planning and design progresses, more detail of specific products and expected amounts will be included in this plan.

Safety Data Sheets for select substances are presented in Appendix A of this plan. The SDS will be updated in a future version of Plan, once the materials have been procured and prior to sealift delivery to the MLA or air transport to the Goose Property.

7.4 SPILL PREVENTION

Training and awareness are two major elements of spill prevention. All site staff and contractors will review the contents of the SCP during their on-site orientation and will be informed of where copies of the Plan are stored. The mandatory site orientation will provide hazard awareness training, identify the locations of spill kits and other response equipment, and discuss appropriate application. A more detailed description of the training to be provided to site staff is provided in Section 5 of this plan.

In addition to training, all work sites and hazardous materials storage facilities will be routinely inspected. Good housekeeping practices will be adopted with emphasis on storage facilities and loading zones.

General practices to be implemented by Sabina that support spill prevention include:

- Assign spill response personnel and clearly publish their contact information.
- Provide easy access to current SDS for all hazardous materials on-site.
- Maintain updated inventory of hazardous materials present at each site (in the HMMP; SD-13).
- Store materials in appropriate containers to the specified capacity, in areas adequately protected from weather and physical damage.
- Conduct regular inspections of storage facilities.
- Segregate incompatible materials.
- Provide training involving the SCP, Spill Kits, and other response equipment.
- Stock adequate spill response materials and equipment, and have them readily available for transportation, transfer and storage of hazardous materials.
- Create an environment which promotes prompt communications of all spill incidents.

7.5 SPILL RESPONSE EQUIPMENT

Available heavy equipment and aircraft will be used as appropriate for emergency use to respond to spill incidents. Appropriately sized spill kits and spill response equipment will be strategically located in vehicles and all Project sites, especially the active mining areas.

Each department will be responsible for providing all necessary SDS and sufficient spill response kits in their respective work areas. Spill Kits and SDSs will be stored in marked areas, readily accessible to responders. The Spill Kit location maps for the MLA area as well as the Goose Property are identified in

Figure 7.2-1 and 7.2-2, respectively. Any spill kit location updates within either of these two areas will be applied to these reference maps as the Project develops.

Spill kits will be customized to account for specific hazards and conditions in each work site. Customized spill kits particular for the activity and area will be selected for use on the site as required. At a minimum, each kit will contain:

- Sufficient hydrophobic absorbent material (e.g., oil absorbent booms and absorbent socks) to contain and cleanup potential drips, leaks, or spills.
- Gloves and heavy plastic bags to contain oily absorbent materials and contaminated soils or wastes.
- Barrier tape to keep personnel out of contaminated areas.
- Sorbent granular materials to soak up free oil.
- Other appropriate PPE such as disposal coveralls, rubber gloves, and safety goggles.

A vehicle outfitted with a self-contained collection of spill response materials for rapid deployment to spill sites will be utilized.

Reserve spill response equipment such as booms, socks and pads will be available for response to larger spill incidents, or to replenish materials used in the smaller equipment spill kits. Spill kits will be inspected routinely and restocked after use.

Table 7.5-1 provides a general list of mobile and stationary equipment likely available on-site. This list will vary by Project phase and response requirements.

Table 7.5-1. General Equipment for Emergency Spill Response

Mobile Equipment	
Grader	Winch Trucks
Cranes	Pickup Trucks
Snowmobiles	Generator Sets
Vacuum Truck	Fire Truck
Loaders	Aluminium Boats
Backhoes	Fuel Trucks
Bulldozers	Bobcats
Forklifts	Haul Trucks
Water Trucks	Snow Cats
Excavators	
Temporary Containment Systems	
Booms	Spill Kits
Drums	Spill Absorbent Material
Tanks	Silt Fencing
Tailings Storage Facility	Lined Excavations
Emergency Transportation	
Aircraft (helicopter)	Snowmobiles
4-Wheel Drive Vehicles (e.g. Pickup trucks)	Boats
ATVs	
Communication Equipment	
Radios	Fax
Telephone	Wireless Communication Systems
Satellite phone	

A mobile environmental emergency trailer will be located on-site at each of the Project properties; their typical contents are listed in Table 7.5-2.

Table 7.5-2. Environmental Emergency Trailer Equipment List

Equipment	
Pump/skimmer	White oil spill pads
Pump accessories	Universal booms
Vacuum ends	Cell U-Sorb
Tubing or pipes for vacuum or pumping	Sphag Sorb
45 gallon top	Wedge wood
Diesel fuel jerry can	Plug patties
Spill kit accessory	Quattrex bags
Drum opener	Hand shovel
Wescot (to open empty drum screw)	Ice Breaker Chisel
Empty drums	Sledge hammer
Drums berms	Rod bars
Tarps	

7.6 SPILL RESPONSE PROCEDURES

Spills may result from any of the following situations:

- Leaks or ruptures in tanks, drums or containers.
- Equipment failure including valves, hoses, piping or containment structures.
- Overfilling containers.
- Improper storage.
- Spills during transfer.
- Accidents during transportation.

Procedures will vary seasonally and based on the nature of the hazardous material spilled. The applicable SDS will be consulted to ensure that the materials are being handled safely and appropriately. Response procedures specific to land, water, snow, and ice are presented in this section.

8. General Spill Response

All site personnel are briefed on the procedures to be followed to report a spill and initiate spill response. The following details the steps to be taken in the event of a spill. Steps are listed in order of importance; however, circumstances and conditions may alter the order of these steps to meet a specific situation. The Site Superintendent and Environmental Superintendent will be notified as soon as feasible for any spill. The first responder shall contact a supervisor or the Incident Commander, who will be responsible for initiating appropriate spill response.

The process of responding to multiple emergencies including spills is addressed in the RMERP, Section 8.6 (SD-15).

8.1.1 Source Control

Identify the product and determine the source. Reduce or stop the flow of product without endangering anyone. This may involve very simple actions such as turning off a pump, closing a valve, sealing a puncture hole with almost anything handy (e. g., a rag, a piece of wood, tape, etc.), raising a leaky or discharging hose at a level higher than the product level inside the tank, or transferring fuel from leaking containers.

8.1.2 Control of Free Product

Prevent or limit the spread of the spilled material. Accumulate/concentrate spilled product in an area to facilitate recovery. Barriers positioned down-gradient of the spill will slow or stop the progression of the spill. Barriers can consist of absorbent booms, dykes, berms, or trenches (dug in the ground or in snow/ice).

8.1.3 Protection

Evaluate the potential dangers of the spill in order to protect sensitive ecosystems and natural resources. Block or divert the spilled material away from sensitive receptors. This can also be achieved by using various types of barriers.

8.1.4 Clean Up the Spill

Recover and contain as much free product as possible. Recover and containerize/treat contaminated soil, water, and snow. Pressure-wash contaminated bedrock surfaces, shorelines, ice and recover as much as possible oily water for containerization and/or treatment.

8.1.5 Report the Spill

Provide basic information such as date and time of the spill, type and amount of product discharged, photographic records, location and approximate size of the spill, actions already taken to stop and contain the spill, meteorological conditions and any perceived threat to human health or the environment.

8.2 RESPONSE BY SPILL LOCATION

Spills may occur at the Goose Property and the MLA year-round. As such, spills may occur to unfrozen land and water as well as frozen ground, snow and ice. The SCP will be implemented as approved by the NWB. Sabina is committed to updating the Plan as needed to reflect changes in operation (i.e., Phase of

development) and technology and as directed by the NWB in the Type A Water Licence or other regulatory authorization where appropriate.

At the Goose Property, there are numerous lakes and streams in the vicinity, with Goose Lake and its tributaries being the primary waterbody that could be affected by fuel spills. There are no streams at the MLA and the closest waterway is the ocean (Bathurst Inlet).

Spills may also occur along the WIR route during the winter period only. Therefore, spills along the WIR will be onto snow and ice.

The location, weather conditions, and the time of year will influence the degree of environmental contamination that could result from a spill, as well as the response time and available resources. At both the Goose Property and the MLA, manpower and spill response equipment will be readily available, and road access around the properties will enable to rapid deployment of a response to spills.

8.2.1 Spill Associated with Shipping

The Canadian Coast Guard is the lead federal agency for all ship-source spills or pollution incidents in water under Canadian jurisdiction. Sabina recognizes our responsibility to manage the risks effectively and to be prepared to respond in the event of a spill. Response to spills that occur during the act of shipping will be covered under the vessel's SOPEP. The SOPEP is a required document that must be reviewed and approved by Transport Canada.

A tremendous amount of attention is paid to emergency preparedness and response to shipping in Canada and particularly in the Arctic waters. Transport Canada has put in place a significant legislative and regulatory framework that apply to all vessels within Canadian waters. Shipping companies bringing goods and fuel to the MLA must remain in compliance with all regulatory requirements at all times.

8.2.2 Spills during Bulk Fuel Transfer to Land

The *Canada Shipping Act,* 2001, stipulates that operators of designated oil handling facilities must have an OPEP. An OPEP must be reviewed and approved by TC.

Spills that occur during the transfer of fuel from a ship in Bathurst Inlet to the Project, MLA-OHF will be responded to in accordance with the Transport Canada approved OPEP (FEIS Addendum Volume 10, Chapter 6). An OPEP outlines potential spill scenarios, and provides specific procedures for responding to spills while minimizing potential health and safety hazards and environmental damage. It provides instructions to guide all personnel in emergency spill response situations, defines the roles and responsibilities of management and responders and outlines the measures taken to prevent spills, the related exercise and evaluation programme, and the mechanism for regular updates to the plan.

Several preventative measures are in place to minimize risk of spills during bulk fuel transfer including:

- The bulk fuel storage facility, pipeline and all related equipment and infrastructures are inspected prior to the bulk cargo transfer and the inspection methods are documented as a Standard Operating Procedure.
- Complete bulk cargo transfer procedures have been established, a copy of which is found in Annex 5 of the OPEP (SD-18).
- As required by the applicable legislation the ship has a comprehensive SOPEP and a copy of this plan has been reviewed by Sabina.

- In addition to the legislative requirements, the charterer has implemented a shipboard spill response training program and performs routine exercises in spill response operations.
- The ship carries a compliment of spill response equipment as listed in Annex 6 of the OPEP (SD-18) and this equipment is ready at the ship's rail at all times for deployment during cargo operations.
- Sabina oil spill response equipment is on the beach, ready for immediate deployment at all times during cargo operations.
- The workboats and trained responders are available at all times during cargo operations for spill equipment deployment.
- Standard transfer procedures include hourly inspections by workboat of the floating hose for leaks or defects.
- During transfer operations, the shore manifold is manned at all times.
- A low-pressure alarm is installed at the shore manifold that is highly sensitive to differences in pressure during pumping. Any loss in the system will cause a drop in manifold pressure and results in an audible alarm, which is immediately reported by the manifold personnel.
- The bulk fuel storage facility is monitored at all times by Sabina personnel during the transfer.
- The pipeline is inspected hourly on foot during the transfer operation.

For additional information, refer to Table 7.3-3 Mitigation Measures for Identified Accidents and Malfunctions in the Risk Management and Emergency Response Plan.

8.2.3 Spills on Land

Response to spills on land will include the general procedures previously detailed.

Initially use the equipment that is quickly available to build a berm to contain the spill and stop the material from entering any waterway. This can be built with soil, booms, lumber, snow, etc.

These barriers should be placed down gradient (down-slope) from the source of the spill and as close as possible to the source. Barriers slow the progression of flow and also serve as containment to allow for recovery.

A plastic liner should be placed at the foot of and over the dykes to protect the underlying soil or other material and to facilitate recovery of the spill. Construct dykes in such a way as to accumulate a thick layer of free product in a single area (V shaped or U shaped).

Trenches are useful in the presence of permeable soil and when the spill is migrating below the ground surface. A plastic liner should be placed on the down-gradient edge of the trench to protect the underlying soil.

Large volumes of free product should be recovered, as much as possible, by using vacuums and pumps, and containerized. Mixtures of water and fuel may be processed through an oil-water separator. Absorbent sheets should be used to soak up residual spill to water, on the ground (soil and rock), and in vegetation.

8.2.4 Spills on Water

Response to spills on water includes the general procedures previously detailed.

Various containment, diversion and recovery techniques are discussed in the following sections. The following elements must be taken into consideration when conducting response operations:

- Type of waterbody or watercourse (lake, ocean, stream, river).
- Water depth and surface area.
- Wind speed and direction.
- Resonance and range of tides.
- Type of shoreline.
- Seasonal considerations (open-water, freeze-up, break-up, frozen).

If oil is spilled in a lake, containment can be achieved using mobile floating booms to intercept, control, contain and concentrate (i.e., increase thickness) the floating oil. One end of the boom is often anchored to shore while the other is towed by a boat or other means and used to circle the oil slick and return it close to shore for recovery using a skimmer. Reducing the surface area of the slick increases its thickness and thereby improves recovery. Mechanical recovery equipment (i.e., skimmers and oil/water separators) will be mobilized, if required. However, in some lakes it may not be possible to deploy booms using a boat. In this case, measures are taken to protect sensitive and accessible shoreline. The oil slick is monitored to determine the direction of migration. In the absence of strong winds, the oil will likely flow towards the discharge of the lake. Measures are taken to block and concentrate the oil slick at the lake discharge using booms where it can subsequently be recovered using a portable skimmer, a vacuum, or sorbent materials.

In small slow-flowing rivers, streams, channels, inlets or ditches, inverted weirs (i.e., siphon dams) can be used to stop and concentrate moving oil for collection while allowing water to continue to flow unimpeded. In the case of floating oil in a stream or migration to a culvert (i.e., at a road crossing) a culvert block can be used to stop and concentrate moving oil for collection while allowing water to continue to flow unimpeded. In both cases, oil will then be recovered using a portable skimmer or sorbent materials.

In the case of spills in larger rivers with fast moving currents, diversion booming is used to direct the oil slick ashore for recovery. Single or multiple booms (i.e., cascading) may be used for diversion. Typically, the booms are anchored across the river at an angle. The angle will depend on the current velocity. Choosing a section of a river that is both wider and shallow will make boom deployment easier. Diversion booming may also be used to direct an oil slick away from a sensitive area to be protected.

8.2.5 Spills on Snow and Ice

In general, snow and ice will slow the movement of hydrocarbons. The presence of snow may also hide the oil slick and make it more difficult to follow its progression. Snow is generally a good natural sorbent, as hydrocarbons have a tendency to be soaked up by snow through capillary action. However, the use of snow as a sorbent material is to be limited as much as possible. Snow and frozen ground also prevent hydrocarbons from migrating down into soil or at least slow the migration process. Ice prevents seepage of fuel into the water.

Response to spills on snow and ice includes the general procedures previously detailed. Most response procedures for spills on land may be used for spills on snow and ice. The use of dykes (i.e., compacted snow berms lined with plastic sheeting) or trenches (dug in snow or ice) slow the progression of the fuel and also serve as containment to allow recovery of the fuel. Free product is recovered by using a vacuum, a pump, or sorbent materials. Contaminated snow and ice is scraped up manually or using heavy equipment depending on volumes.

Should spills enter waterways beneath ice cover, ice augers and pumps will be used when feasible to recover fuel and other materials under ice. Slots may be cut in ice over slow-moving water to contain oil. Tiger torches may be used to burn the fuel in place, if unrecoverable by other methods and when feasible and safe to do so.

The contaminated snow and ice is placed in containers or within plastic lined berms on land. For contingency purposes, a contaminated snow storage site will to be designated and located in close proximity to each of the main Project work sites to facilitate inspection and monitoring, in an area which will still be readily accessible once it is time to remove the snow (i.e., spring or summer), and at least 31 m away from any body of water or ditch. Once enough snow has melted, the oily water can be removed from the storage site and processed through an oil-water separator that would be mobilized to site. Hydrocarbons recovered will be burned in the camp incinerator or shipped off-site.

8.2.5.1 Spills on the Winter Ice Road

Fuel and other materials will be transported by truck over the winter road each year, and a spill may occur if a truck accident were to occur, either due to a collision with another vehicle, or more likely, due to the truck slipping off the road. The remoteness of such an incident limits the ability to mount an immediate comprehensive response. Response to spills that occur as a result of Project traffic along the WIR will have varying response times, depending on the distance from nearby vehicles, the distance from a spill location along the WIR from either of the properties, and the weather conditions which could slow the response. Radio communication on the WIR is an important tool for communicating an incident and all vehicles transiting the roadways will be equipped with 2-way radio and/or satellite phone communication capabilities. Initial response will likely be left to the driver and possibly any nearby vehicles. Each WIR transport truck will be equipped with spill response equipment and drivers will be trained for such potential accidents. Winter conditions along the WIR will help contain spills and reduce the potential of spills from entering local waterways. The general spill response procedures, and those for spills on snow and ice described in Section 8.1 and Section 8.2.5 of this plan provide appropriate guidance for such spills. The distinguishing factor with tanker or vehicle spills along the road is the remoteness of the spill location and therefore the delay in receiving assistance after notifying the environmental superintendent, and the priority on the health and safety of the driver and others involved.

Several preventive measures are in place to the minimize risk of spills during bulk fuel haul in addition to those listed above for bulk fuel transfer. These measures are explained in the Road Management Plan (SD-02) and this plan. Spill prevention practices specific to winter roads include:

- Inspection and maintenance of roadways and vehicles (Road Management Plan; SD-02).
- Adhering to traffic management and road safety practices (Road Management Plan; SD-02).
- General spill prevention (Section 7.4).

In addition, the Fuel Management Plan (SD-16) includes detail on the safe handling and storage of fuel. Specifically, more information has been added to roles and responsibilities (Section 5), potential

environmental effects (Section 7.6), environmental monitoring (Section 8) and mitigation and adaptive management (Section 9).

8.3 RESPONSE BY TYPE OF MATERIAL SPILLED

8.3.1 Fuel

Regular inspections will be conducted to ensure that there has not been a leak or that conditions within fuel storage areas could result in a leak. These inspections will include the fuel drums and storage containers, secondary containment sumps and associated spill containment devices, any pumps and product-handling equipment, and overfill protection devices. Inspections will be recorded to include who completed the inspections, areas included in the visual inspection and any deficiencies noted.

Fuel spills, leaks at fuel storage or transfer facilities or vehicle accidents will be handled by following these steps:

- Identify the source of the leak or spill.
- Stop leaks from tank or barrel by closing valves, provided it is safe to do so.
- Contact the Environmental Superintendent/Site Superintendent.
- Utilizing patching kits to seal leaks.
- Placing plastic sheeting at the foot of the tank or barrel to prevent seepage into the ground.
- Contain the spill and the source if possible.
- Take photographs of the spill site before and after the clean-up.

Small spills will be cleaned up by removing the contaminated soil and storing it in empty 205 L drums for backhaul and disposal at an approved hazardous waste disposal site. Should a large spill occur, cleanup and disposal efforts will be coordinated as necessary with the appropriate authorities and agencies.

For additional information, refer to the Fuel Management Plan (SD-16).

8.3.2 Domestic Sewage

Sewage treatment facilities at the MLA will consist of Pacto toilets; in the unlikely event that a spill occurs, it would be from a single unit and of small volume.

A sewage treatment plant (STP) will treat up to approximately 170 cubic metres per day (m^3/d) of domestic sewage at the Goose Property. The STP will be located in the Plant Site area and, during the Construction Phase, treated sewage effluent will be land discharged to maximize attenuation distance prior to entering an outflow watercourse from Fox Lake and ultimately entering Goose Lake. During Operations, effluent will be discharged to the active tailings management facility; the ammonia loadings from this STP effluent discharge has been accounted for in the water and load balance. Analysis has confirmed that ammonia concentrations associated with STP effluent is not acutely toxic. If during Operations, STP effluent meets discharge requirements, Sabina may choose to discharge on land consistent with Construction Phase STP effluent management.

Off-specification treated sewage during upset conditions will be discharged to the closest collection pond. Any discharges of sewage effluent from the collection pond will need to meet the applicable discharge criteria (refer to Landfill and Waste Management Plan; SD-10). In-pond treatment by

coagulation can be applied if required as a contingency. During Operations, effluent will be discharged to the active tailings storage facility (TSF).

A spill of untreated or treated sewage could occur from the system itself or from a ruptured pipeline. Any problems with the STP will be promptly reported to the Site Superintendent.

In the event of a power failure, the stand-by generator will be put into operation as soon as possible. Similarly, in the case of a pump failure, the backup pump will be put on-line. As necessary appropriate safety equipment and personal protective clothing will be available to site personnel.

Should a spill of untreated sewage occur from the STP or pipelines at the Goose Property, priority will be to contain the spill and prevent release of the untreated sewage into local watercourses. The spilled effluent and any affected water will be recovered and discharged into the active tailings facility. It will not be necessary to remove affected ice or excavate affected soils.

8.3.3 Tailings or Reclaim Water

A spill of tailings or reclaim water may potentially occur. Though highly unlikely, a spill could occur from an overtopping or breach of the TSF embankment. Such a spill, however unlikely, could also occur from a tailings pipeline, or a reclaim water pipeline returning water from the TSF or TF to the Process Plant. Tailings or contact water may contain trace (< 1 mg/L) cyanide which can be toxic to aquatic organisms, but also breaks down rapidly and does not persist in the environment.

In the event of an unplanned release from the TSF, the emergency response plan will be implemented. The TSF embankments and supernatant water level in the TSF will be instrumented and regularly monitored as described in the Tailings Management Plan (SD-09). In the instance of a pipeline rupture, pressure sensors instrumented in the pipelines will signal a loss of pressure that will signal an alarm to shut-off the pumps, thereby limiting the volume of material that may be released.

Should a spill of tailings or reclaim water occur, priority will be to contain the spill and prevent the release of tailings or reclaim water into local watercourses. The spilled tailings or effluent will be recovered and disposed of in the active tailings facility.

8.3.4 Chemicals

Assess the hazard of the spilled material by referring to the relevant SDS. Each response will vary based on the specific material. If the chemical is hazardous, ensure PPE is utilized (latex gloves, eye protection, etc.) before approaching the spill. As most chemicals are only used in extremely small quantities on-site, absorbent mats can be used to soak up spilled liquids then placed in appropriate containers for treatment and/or disposal.

Sodium cyanide is the main hazardous chemical that will be used in large quantities by the Project. It will be delivered by sealift in solid form in tote bags within shipping containers. They will be protected from the elements to prevent contact with water during transport and storage. Spillage, although unlikely, is possible during transport from the MLA to Goose Property over the WIR.

Sodium cyanide is used in the Process Plant to extract the gold and a cyanide destruction process reduces residual cyanide concentrations in the tailings supernatant, as discussed in the previous section. A Cyanide Management Plan included as an appendix to the HMMP (SD-13) describes the measures to be undertaken for the safe handling of cyanide and other hazardous materials on the Project. Cyanide breaks down into carbon and nitrogen in the presence of sunlight and ammonia breaks down into other nitrogen compounds.

Response to spills would involve clean-up of mainly solids and any affected soil, snow or ice. Clean up will be undertaken by workers with appropriate training in the safe handling of the chemical (sodium cyanide). Any affected waters can be contained and recovered for disposal if this is practical, or can be monitored for degradation, attenuation, and dilution.

General guidelines for cleaning up spills of chemicals including sodium cyanide are similar to previously identified Sections 8.2.2 and 8.2.3.

- For an accidental release to the land, depending on the topography, contain the discharge by constructing a perimeter dyke system.
- Collect the material through absorbent material, booming or absorbent matting. For release to water, depending on the circumstance, utilize damming, water diversion, skimming or booming to minimize the dispersion of the spilled material.
- Collect the contaminated soil and/or water as well as the absorbent materials used in the process afterwards for proper disposal in a certified waste handling facility. Collect any spilled material followed by placing same inside a container such as a 205 litre drum and seal with a lid.
- Label the drum(s), store within a designated area, keep closed and when available, transport to a licensed disposal facility for disposal.
- Ensure the spill area and equipment used to manage the spill has been cleaned prior to demobilizing from the spill area.
- Contact the appropriate regulatory groups through the notification procedure and advise of the spill situation depending on whether the spill is reportable or could adversely affect the environment.

The transport of sodium cyanide will require the development of ERAPs under Section 7 of the TDGR. The plans will outline what is to be done to respond to an actual or anticipated release of the specific dangerous goods in the course of their handling or transporting that could endanger public safety. The ERAPs require the approval of the Minister of Transport. With the permission of the supplier, a supplier's approved ERAP can be adopted and used by a user such as Sabina. Relevant ERAPs will be developed or adopted by Sabina or its contractors and incorporated into this SCP when they become available, for the Project's transport of the applicable dangerous goods.

8.3.5 Ammonium Nitrate and Explosives

Ammonium nitrate (AN) may be spilled during handling and ammonium nitrate fuel oil may be spilled during handling or during use in the open pit or underground. AN dissociates readily in water to ammonia which, in its unionized form, may be toxic to fish and other aquatic organisms.

With adherence to Best Management Practices for AN storage and handling there is minimal risk of AN spillage. Storage on land, away from water, in containers protected from the elements, significantly reduces the risk of ammonia loss to water bodies. Release of these materials into a waterbody during the open water season is highly unlikely. Spill locations would be generally limited to single storage bags within the AN facility or ISO containers in the storage pad areas. These areas will be inspected regularly according to operating procedures.

General guidelines for cleaning up spills of these types of materials are similar to previously identified Sections 8.2.2 and 8.2.3. Any affected waters can be contained and recovered for disposal if this is practical, or can be monitored for degradation, attenuation, and dilution.

Spill prevention and response actions will include the following:

- o establish and use SOPs for handling and working around storage areas;
- o ensure proper containers are used for the storage and transport of explosives and AN;
- o restrict access to authorized and trained personnel;
- o conduct regular inspections of storage areas, containers, and transport vehicles with frequency driven by activity levels;
- o clean up dry AN according to established SOPs, to minimize likelihood of nitrates entering watercourses;
- o manage and limit contact with snow and water, with particular anticipation of spring thaw/freshet period; and
- o properly dispose of spill material and any impacted rock pad material, which could include placing within a blast pattern prior to initiation.

The transport of potential explosives will require the development of ERAPs under Section 7 of the TDGR. The plans will outline what is to be done to respond to an actual or anticipated release of the specific dangerous goods in the course of their handling or transporting that could endanger public safety. The ERAPs require the approval of the Minister of Transport. With the permission of the supplier, a supplier's approved ERAP can be adopted and used by a user such as Sabina. Relevant ERAPs will be developed or adopted by Sabina or its contractors and incorporated into this plan when they become available, for the Project's transport of the applicable dangerous goods.

Simplified spill response scenarios for potential explosives are presented in Table 8.3-1 below. More information will be provided as part of the supplier ERAP when it is available. Waste Management and Pollution Prevention Strategies for Ammonium Nitrate, ANFO, and other hazardous materials are presented in Appendix A of this plan.

Table 8.3-1. Simplified Spill Response Scenarios for Potential Explosives

Product	Location of Potential Spill	Potential Size of Spill	Response
Ammonium nitrate	Broken bags in the explosives storage area	1000 kg or more depending on the number of bags damaged	The blasting contractor or qualified mine personnel will clean up and salvage AN prill; damaged bags will be emptied into new bags and damaged bags burned in the incinerator.
	Broken tote bags in the mixing plant	Part of 1000 kg	
ANFO	Broken transport bags in the mixing plant	Up to 1000 kg	The blasting contractor will clean up and salvage ANFO; the plant area will be completely cleaned of ANFO and damaged bags will be burned in the incinerator.
	Spilled transport bags on the site delivery vehicle	1000 kg or more depending on the number of bags spilled	The blasting contractor will clean up and salvage ANFO. The spill area will be cleaned up and the spilled ANFO burned by the blasting contractor. The delivery truck will be cleaned if required.
Detonators and blasting caps	Transport to blast site	One or more containers of products	Will be cleaned up and disposed by explosive contractor.

8.4 RESPONSE TO FIRE

Various products, including fuel, may be flammable under certain circumstances. It is important to ensure that the spill does not present a risk of fire prior to commencing the cleanup. Site firefighting procedures can be found in the RMERP (SD-15).

Water for firefighting will be provided from the fresh/firewater tank at the Goose Plant Site and the MLA. The tanks are sized considering facility design and applicable regulations to support firefighting (i.e., *Mine Health and Safety Act* and Regulations; National Fire Code). There will be firefighting equipment on-site, and the means to obtain additional water to support firefighting in an emergency. Water will likely be sourced from the existing pump houses at the site, but may also be obtained directly from waterbodies near to the fire.

8.5 DISPOSAL

Appropriate disposal for any recovered product and contaminated soil, water or absorbent clean up material is regulated and must be authorized by the agency investigating the incident. Obtain approval from all appropriate government agencies before disposal.

Fuel-contaminated soil can be remediated at camp through land-farming or incineration. Any non-reusable recovered product, contaminated soil and clean up material, which cannot be incinerated, will be stored in containers and returned to camp prior to eventual disposal in an approved disposal/treatment site.

8.6 POST-SPILL MONITORING AND REMEDIATION

Should there be any concern of contaminants remaining in the area following clean-up, appropriate sampling and monitoring should be undertaken to determine residual contamination. Based on the results of the monitoring program the site should be remediated as necessary. For spill response monitoring, quality assurance / quality control measures and standard operating practices, using established monitoring protocols will be followed. Specific monitoring requirements will be implemented on a case by case basis as required. Additional monitoring may be directed and/or provided by the Lead Agency (i.e., lead governmental agency identified upon notification of spill to the hotline) and/or the Water Resources Officer.

8.7 SPILL FOLLOW-UP INVESTIGATION

The root cause of all spills will be investigated. An incident investigation will be performed by the Environmental Superintendent following every major spill. Minor spills as defined in Section 2, will be investigated by the appropriate supervisor. The likely cause of the spill will be determined, and remedial action will be taken to ensure that similar spills are prevented. Remedial action may involve:

- Additional training for personnel.
- Enhanced equipment maintenance or inspection program.
- Additional preventative infrastructure, such as containment berms, oil/water separators, etc.
- The performance of the spill response procedures will also be reviewed, and updated as necessary.

9. Spill Reporting

9.1 MARINE SPILL REPORTING:

Spills of a marine nature will be reported to the Canadian Coast Guard (Central and Arctic region):

- 1-800-265-0237 (24-hour).
- The fax number for transmission of the written report is (519) 337-2498.

Reporting of marine spills shall be conducted in accordance with Transport Canada Guideline TP-9834E, "Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and /or Marine Pollutants". Sabina will report any presence of oily sheens on the water near vessels at the port site to the NT-NU Spill Line.

The Vessel Pollution and Dangerous Chemical Regulations, (SOR 2012-69) require that spills be reported to the nearest office of Transport Canada as follows:

Manager, Technical Services
Transport Canada, Marine Safety
Tel: 204 984 8618
Cell: 204 880 0754
Email: TBD

Manager, Marine Safety (PNR)
Transport Canada
Tel: 204 984 0397
Fax: 204 984 8417
Email: TBD

9.2 TDGR REPORTING:

In addition, the TDGR has immediate and 30-day reporting requirements for dangerous goods accidents or incidents if the spill occurred during transport. **Immediate reporting** is required by the TDGR to:

- The Local police
- Nunavut Emergency Services at 1 800 693 1666
- The person's employer;
- The consignor of the dangerous goods;
- The owner/lessee/charterer of the road vehicle involved (if applicable); and
- CANUTEC at 613 996 6666 for railway vehicles, ships, aircrafts, aerodromes or an air cargo facility; for Class 1 Explosives and Class 6.2 Infectious Substances; and for an accidental release from a cylinder that has suffered a catastrophic failure.

A **follow-up report** must be made by the employer of the person who had possession of the dangerous goods at the time of the accidental release, the "dangerous goods accident" or the "dangerous goods incident", or by the person if self-employed. The follow-up report must be made, in writing, to the

Director General within 30 days after the occurrence of the accidental release, the "dangerous goods accident" or the "dangerous goods incident". The follow-up report must include the following information:

- The name and address of the place of business of the person providing the information and the telephone number, including the area code, at which that person may be contacted;
- The date, time and location of the accidental release, the "dangerous goods accident" or the "dangerous goods incident";
- The name and address of the place of business of the consignor;
- The classification of the dangerous goods;
- The estimated quantity of dangerous goods released and the total quantity of dangerous goods in the means of containment before the accidental release, the "dangerous goods accident" or the "dangerous goods incident";
- A description of the means of containment involved based on the identification markings and a description of the failure or damage to the means of containment, including how the failure or damage occurred;
- For an accidental release from a cylinder that has suffered a catastrophic failure, the certification safety marks and a description of the failure;
  - For example, there was an explosion, a valve sheared off or there was a crack in the cylinder.
- The number of deaths and injuries resulting from the accidental release, the "dangerous goods accident" or the "dangerous goods incident";
- An estimate of the number of people evacuated from private residences, public areas or public buildings; and
- **I**f an emergency response assistance plan was activated, the name of the person who responded to the emergency in accordance with the emergency response assistance plan.

The address for the Director General is:

Transport Dangerous Goods (TDG)
Place de Ville, Tower C, 9th Floor, 330 Sparks St.
Ottawa, Ontario K1A 0N5

9.3 INTERNAL RECORD KEEPING

An internal log of spills, no matter how small, will be kept and maintained by the Environmental Department. Each record will include date, location, material spilled, volume, reason for release, any negative impact, status of cleanup, and corrective actions taken. Photos (before, during and after cleanup) shall also be taken of all significant spills. To assist with internal tracking, a Sabina Spill Form is included in Appendix C.

A record will document all significant changes that have been incorporated in the SCP subsequent to the latest annual review. The record will include the names of the persons who made and approved the change, as well as the date of the approval.

10. Adaptation Management

The SCP will be updated annually to incorporate lessons learned from any incidents that may have occurred, amendments to legislation, new characteristics of the sites, the equipment on-site, new policies of the company, environmental issues and to provide updated information on new staff, external contact details and other changes. Changes to roles and responsibilities will also be incorporated into the RMERP (SD-15), as the emergency response team is the same.

Most important will be the review of aspects of the Plan affecting safety of employees of the facility, contractors, and the general public. Operational aspects of the Plan, as well as any paperwork that deals with the Plan, will be reviewed. All aspects of the Plan will be continuously audited for effectiveness.

The updated version of the Plan will be distributed to the distribution list. Formal evaluations of the SCP will be documented, deficiencies noted in the report, and progress in addressing deficiencies tracked in writing. Responsibilities to address deficiencies and accountabilities will be assigned and deadlines for addressing required changes will be set.

11. Reclamation

Closure and final remediation of spills reported to the Spill Hotline will be verified by the Lead Agency (refer to Spill Report Form in Appendix D). Hazardous materials spill will be reclaimed as defined in the HMMP (SD-13). In support of progressive reclamation, Sabina will apply bioremediation treatment of hydrocarbon contaminated soil, snow, and ice at the MLA and Goose Property using naturally occurring microorganisms to metabolize and breakdown petroleum hydrocarbons in soils. For additional information, refer to the Landfarm Management Plan (SD-12). Additional details pertaining to Closure, are provided in the Interim Closure and Reclamation Plan (SD-26).

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Appendix A. SDS for Hazardous Substances Stored On-Site

Material Safety Data Sheet

Desiccant: ACTIVATED CARBON

Revision Date: 06/27/14 Supersedes: 5/18/11

PRODUCT NAME: Activated Carbon

COMPANY IDENTIFICATION

Suppliers Name: SPX Flow Technology

Address: 4647 S.W. 40th Avenue
Ocala, Florida 34474-5799 USA

EMERGENCY TELEPHONE No. *352-237-1220*

FOR PRODUCT INFORMATION *352-237-1220*

1. PRODUCT IDENTIFICATION

Product Name: Activated Carbon

2. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% by Weight
Carbon	7440-44-0	100

Non-hazardous components are listed at 3% or greater; acute hazards are listed when present at 1% or greater and chronic hazards are listed when present at 0.01% or greater.

3. HAZARDS IDENTIFICATION

OSHA Regulatory Status: Not regulated.

HMIS Classification:		NFPA Classification:	
Health:	0	**Health:**	0
Flammability:	1	**Flammability:**	1
Reactivity:	0	**Reactivity:**	0
Special:		**Special:**	

0 = minimum; 1 = slight; 2 = moderate; 3 = high/serious; 4 = extreme/severe; W = water reactive; OX = oxidizer

Protective Equipment: Safety glasses with side shields or goggles, gloves, long sleeve shirt or lab coat, long pants recommended.

Health: See Section 4.

Environmental Effects: See Section 12.

GHS Classification:
Eye Irritation Category 2B.
Respiratory Irritation Category 3

WARNING: Contact may cause eye irritation. Dust may be slightly irritating to eyes and respiratory tract. Wet activated carbon removes oxygen from air causing a severe hazard to workers in enclosed or confined space.

Precautionary Statements:
Prevention: Avoid generation of dust during handling. Avoid breathing dust. Wash thoroughly after handling. Use in well-ventilated area.

Response: If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes.

Storage: Store in a well-ventilated place. Keep container tightly closed.

4. FIRST AID MEASURES

Route of Exposure:

Inhalation: Dust may cause mild irritation to the upper respiratory tract.
Skin: Dust may cause mild irritation, possibly reddening.
Eyes: Dust may cause mild irritation, possibly reddening.
Ingestion: Dust may cause mild irritation to digestive track resulting in nausea or diarrhea.

Signs/Symptoms of Exposure: Dust may cause irritation and redness of eyes, irritation of skin and respiratory system. The effects of long-term, low-level exposures to this product have not been determined.

Emergency and First Aid Procedures:

For Eye Contact: Flush eyes with plenty of water for at least 15 minutes, lifting both upper and lower lids occasionally. Seek medical attention.
For Skin Contact: Wash with soap and warm water. Seek medical attention.
For Inhalation: Remove to fresh air and rest as needed. Seek medical attention for any breathing difficulty.
For Ingestion: Drink plenty of water. Seek medical attention.

Medical Conditions Generally Aggravated by Exposure: People with pre-existing skin conditions or eye problems or impaired respiratory function may be more susceptible to the potential effects of the dust.

5. FIRE AND EXPLOSION HAZARD DATA

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

Unsuitable Extinguishing Media: None known.

Specific Hazards: As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source. Activated carbon is difficult to ignite and tends to burn slowly (smolder) without producing smoke or flame.

Carbon monoxide and carbon dioxide gas may be emitted upon combustion of material.

Contact with strong oxidizers such as ozone or liquid oxygen may cause rapid combustion.

Protective Equipment and Procedures: Wear NIOSH approved self-contained breathing apparatus suitable for the surrounding fire.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear protective equipment, keep necessary personnel away, and ventilate area of spill.

Environmental Precautions: The material is not soluble, but can cause a particulate emission if discharged to waterways; therefore, dike all entrances to sewers and drains to avoid introducing the material into the waterways.

Containment and Clean-Up: Dike all entrances to sewers and drains. Vacuum or shovel spilled material and place in closed container for disposal.

Remove product to appropriate storage area until it can be properly disposed of in accordance with local, state and federal regulations. Avoid dust formation

Other Information: Not Applicable.

7. HANDLING AND STORAGE

Precautions for Safe Handling: Avoid prolonged contact with eyes and skin. Keep away from ignition sources. Use in well ventilated areas. Protect containers from physical damage. Wash hands after handling.

Precautions for Safe Storage: Store in cool, dry, ventilated area and in closed containers. Keep away from oxidizers, heat or flames. Store away from ignition sources.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

	OSHA PEL	ACGIH TLV
Activated Carbon	Data not available	Data not available

Exposure Guidelines: Wet activated carbon removes oxygen from air posing a hazard to workers in enclosed or confined space. Before entering such an area, sample the air to assure sufficient oxygen supply. Use work procedures for low oxygen levels, observing all local, state and federal regulations.

Engineering Controls: Exhaust ventilation should be designed to prevent accumulation and recirculation in the workplace and safely remove carbon black from the air.

NOTE: Wet activated carbon removes oxygen from air causing a severe hazard to workers in enclosed or confined space.

If risk of overexposure exists, wear an approved respirator. Provide adequate ventilation in warehouse or closed storage area.

Personal Protective Equipment: Use of NIOSH approved particulate filter is recommended if dust is generated in handling. The usual precautionary measures for handling chemicals should be followed, i.e. gloves, safety glasses with side shields or goggles, long sleeve shirt or lab coat, dust respirator if dusty and/or other protective clothing/equipment as determined appropriate.

General Hygiene: The usual precautionary measures for handling chemicals should be followed: i.e. Keep away from food and beverage; remove contaminated clothing immediately; wash hands before breaks or eating; avoid contact with eyes and skin.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Black granular or powder material
Odor: None.
pH Value: Not applicable.
Melting Point: Not applicable.
Freezing Point: Not applicable.
Initial Boiling Point: Not applicable.
Flashpoint: Not applicable.
Evaporation Rate: Not applicable.
Flammability: > 220°C
UEL: Not applicable.
LEL: Not applicable.

Molecular Weight: Not applicable.
Odor Threshold: None.
Vapor Pressure: 0
Vapor Density: Solid
Relative Density: 0.4 to 0.7
Solubility: Not Soluble.
Partition Coefficient: Not applicable.
Auto Ignition Temperature: > 220°C
Decomp. Temperature: Not applicable.
Viscosity: Not applicable.

10. STABILITY AND REACTIVITY

Chemical Stability: Stable.

Conditions to Avoid: None.

Possibility of Hazardous Reaction: Will not occur.

Conditions to Avoid: None.

CAUTION: High concentrations of organics in air will cause temperature rise due to heat of adsorption. At very high concentration levels this may result in a thermal excursion, referred to as a bed fire. High concentrations of Ketones and Aldehydes may cause a bed temperature rise due to adsorption and oxidation.

Materials to Avoid: Alkali metals and strong oxidizers such as ozone, oxygen, chlorine, permanganate, etc.

Hazardous Decomposition Products: Carbon monoxide and carbon dioxide gas may be generated during combustion of this material.

11. TOXICOLOGICAL INFORMATION

Acute Effects:

Toxicity Studies: Oral LD_{50}: Not determined on the finished product.
Dermal LD_{50}: Not determined on the finished product.
Inhalation: See section 4.
Ingestion: See section 4.
Eye Irritation: See section 4.
Skin Irritation: See section 4.
Sensitization: Not determined on the finished product.
Target Organ(s) or System: Eyes, skin and upper respiratory system.
Signs and Symptoms of Exposure: Irritation and redness of eyes, irritation of skin and respiratory system may result from exposure to carbon dust. See sections 3 and 4.

Chronic Effects:

Carcinogenicity: Not determined on the finished product.
Mutagenicity: Not determined on the finished product.
Reproductive Effects: Not determined on the finished product.
Developmental Factors: Not determined on the finished product.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Not determined on the finished product.

Persistence/degradability: Not determined on the finished product.

Bioaccumulation/Accumulation: Not determined on the finished product.

Mobility in Environmental Media: Not determined on the finished product.

Other Adverse Effects: Not determined on the finished product.

13. DISPOSAL CONSIDERATIONS

Vacuum or shovel material into a closed container. Storage and disposal should be in accordance with applicable local, state, and federal laws and regulations. Local regulations may be more stringent than state or federal requirements. Activated carbon is an adsorbent media; hazard classification is generally determined by the adsorbate that the carbon has picked up. Consult with the US EPA Guidelines listed in 40 CFR Part 261.3 for the classifications of hazardous waste prior to disposal.

14. TRANSPORT INFORMATION

This information as presented below only applies to the material as shipped. The identification based on characteristic(s) or listing may apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Land:

DOT Regulations:
UN/NA Identification Number: None
UN Proper Shipping Name: Not Regulated.
Transport Hazard Class: None
Packing Group: None
Marine Pollutant: None
Canadian WHMIS:
Hazard Class: None

Water:

IMO/IMDG:
UN/NA Identification Number: None
UN Proper Shipping Name: Not Regulated.
Transport Hazard Class: None
Packing Group: None
Marine Pollutant: None

Air:

ICAO/IATA:

UN/NA Identification Number: None
UN Proper Shipping Name: Not Regulated.
Transport Hazard Class: None
Packing Group: None
Marine Pollutant: None

This product has been tested according to the *United Nations Transport of Dangerous Goods* test protocol for a "self-heating substance". It has been specifically determined that this product does not meet the definition of a self heating substance or any other hazard class, and therefore is not a hazardous material and not regulated.

15. REGULATORY INFORMATION

SARA TITLE III 302: Product is not subject to SARA Title III, section 302 regulation.
SARA TITLE III 313: Product is not subject to SARA Title III, section 313 regulation.
TSCA: Product is listed.
California Proposition 65: Product is not listed.

Canadian Classification: **WHMIS CLASSIFICATION:** Product is listed.
DSL#: Product is listed.

EEC Council Directives relating to the classification, packaging and labeling of dangerous substances and preparations.
Risk (R) and Safety (S) phrases:
R36: Irritating to the eyes.
R37: Irritating to the respiratory tract.
R38: Irritating to the skin.

Activated Carbon (CAS: 7440-44-0) is found on the following regulatory lists:
Canada – British Columbia Occupational Exposure Limits
Canada – Yukon Permissible Concentrations for Airborne Containment Substances
Canada – Domestic Substances List (DSL)
International Air Transport Association (IATA) Dangerous Goods Regulations
OECD Representative List of High Production Volume (HPV) Chemicals
US – Hawaii Air Contaminant Limits
US – Idaho – Toxic and Hazardous Substances – Mineral Dust
US – Minnesota Hazardous Substance List
US – Minnesota Permissible Exposure Limits (PELs)
US – Rhode Island Hazardous Substance List
US – Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US – Washington Permissible Exposure Limits of Air Contaminants
US DOE Temporary Emergency Exposure Limits (TEELs)
US EPA High Production Volume Program Chemical List
US FDA CFSAN Color Additive Status List 4
US FDA CFSAN Color Additive Status List 6

16. OTHER INFORMATION

Supersedes: 05/18/11

Intended Use: Generally used for treatment of liquids and gases.

Desiccant: ACTIVATED CARBON

Material Safety Data Sheet

ATTENTION: Plant Manager/Safety Director:

This MSDS supersedes all prior data sheets received for this product. We urge you to study it carefully. This is provided with each container as our way of communicating Health, Safety, and Environmental Protection Information to our customers.

This information is provided to ensure safe handling and storage of our products in accordance with OSHA Hazard Communication Standard 29 CFR 1910.1200. The information contained in this MSDS must be passed on to all employees in your firm that handle and/or become involved in the implementation or control of operations involving use of the product. We strongly urge you to forward this MSDS to all parties that have a need to know the information contained herein!

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LEGEND:

ACGIH	American Conference of Government Industrial Hygienists
AICS	Australian Inventory of Chemical Substances
CAS	Chemical Abstract Services
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DOT	Department of Transportation
DSL	Domestic Substances List (Canada)
ECOIN	European Core Inventory
EPA	Environmental Protection Agency
IARC	International Agency for Research on Cancer
LC_{50}	Lethal Concentration (50% kill)
LC_{LO}	Lowest Published Lethal Concentration
LD_{50}	Lethal Dose (50% kill)
LD_{LO}	Lowest Published Lethal Dose
NFPA	National Fire Protection Agency
NIOSH	National Institute of Occupational Safety and Health
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PIN	Product Identification Number
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
TCLP	Toxic Chemicals Leachate Program
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average

atm	atmosphere
cm	centimeter
g, gm	gram
in	inch
kg	kilogram
lb	pound
m	meter
mg	milligram
ml, ML	milliliter
mm	millimeter
n.o.s.	not otherwise specified
ppb	parts per billion
ppm	parts per million
psia	pounds per square inch
µ, u	micron
µg	microgram

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

Product Identifier

Product Form: Mixture

Product Name: Amex™, Amex™ UG, Amex™ WR

Product Code: 3001

Synonyms: ANFO, Ammonium Nitrate Fuel Oil, Water Resistant ANFO, Water Resistant Amex™, Underground AMEX, and Underground ANFO

Intended Use of the Product

Booster sensitive blasting agent and water resistant blasting agent. For professional use only.

Name, Address, and Telephone of the Responsible Party

Canada:
Orica Canada Inc.
301 Rue Hotel-de-Ville
Brownsburg-Chatham, QC
J8G 3B5
For SDS Requests:
1-855-26-ORICA
sds.na@orica.com
www.oricaminingservices.com

USA:
Orica USA Inc.
33101 E. Quincy Avenue
Watkins, CO 80137-9406
For SDS Requests: 1-303-268-5000

Emergency Telephone Number

Emergency Number : **Canada:** 1-877-561-3636 (Orica Transportation Emergency Response)
USA: 1-800-424-9300 (CHEMTREC)

FOR CHEMICAL EMERGENCIES (24 HOUR) INVOLVING TRANSPORTATION, SPILL, LEAK, RELEASE, FIRE OR ACCIDENTS: **IN CANADA CALL:** THE ORICA TRANSPORTATION EMERGENCY RESPONSE SYSTEM AT **1-877-561-3636. IN THE U.S. CALL: CHEMTREC 1-800-424-9300. IN THE U.S.:** FOR LOST, STOLEN, OR MISPLACED EXPLOSIVES CALL: BATF **1-800-800-3855.** FORM ATF F 5400.5 MUST BE COMPLETED AND LOCAL AUTHORITIES (STATE/MUNICIPAL POLICE, ETC.) MUST BE ADVISED.

SECTION 2: HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

Classification (GHS-US)

Expl. 1.5	H205
Ox. Sol. 3	H272
Eye Irrit. 2A	H319
Carc. 2	H351
STOT RE 2	H373

Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :

GHS03 GHS07 GHS08

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) :
H205 - May mass explode in fire
H272 - May intensify fire; oxidizer
H319 - Causes serious eye irritation
H351 - Suspected of causing cancer
H373 - May cause damage to organs (thymus, liver, bone marrow) through prolonged or repeated exposure

Precautionary Statements (GHS-US) : P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat, hot surfaces, open flames, sparks - No smoking.
P220 - Keep/Store away from clothing, combustible materials.
P221 - Take any precaution to avoid mixing with combustible materials.
P240 - Ground/bond container and receiving equipment.
P250 - Do not subject to friction, grinding, shock.
P260 - Do not breathe dust, fume, gas.
P264 - Wash hands, forearms, and exposed areas thoroughly after handling.
P280 - Wear eye protection, protective clothing, protective gloves.
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 - IF exposed or concerned: Get medical advice/attention.
P314 - Get medical advice and attention if you feel unwell.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P370+P378 - In case of fire: Do NOT attempt to fight fire. Evacuate area.
P372 - Explosion risk in case of fire.
P373 - DO NOT fight fire when fire reaches explosives.
P401 - Store as defined in the Explosives Act of Canada and the provisions of the Bureau of Alcohol, Tobacco and Firearms regulations contained in 27 CFR part 555.
P405 - Store locked up.
P501 - Dispose of contents/container according to local, regional, national, territorial, provincial, and international regulations.

Other Hazards

Aquatic Chronic 3 H412
H412 - Harmful to aquatic life with long lasting effects
P273 - Avoid release to the environment
Ingestion may cause methemoglobinemia. Initial manifestation of methemoglobinemia is cyanosis, characterized by navy lips, tongue and mucous membranes, with skin color being slate grey. Further manifestation is characterized by headache, weakness, dyspnea, dizziness, stupor, respiratory distress and death due to anoxia.

Unknown Acute Toxicity (GHS US) Not available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Name	Product Identifier	% (w/w)	Classification (GHS-US)
Ammonium nitrate	(CAS No) 6484-52-2	80 - 95	Ox. Sol. 3, H272 Eye Irrit. 2A, H319
Fuels, diesel	(CAS No) 68334-30-5	5 - 10	Flam. Liq. 3, H226 Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373 Asp. Tox. 1, H304

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, IMMEDIATELY seek medical advice (show the label where possible).
Inhalation: Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical advice immediately if you feel unwell.
Skin Contact: Remove contaminated clothing. Gently wash with plenty of soap and water followed by rinsing with water for at least 15 minutes. Call a POISON CENTER or doctor/physician if you feel unwell. Wash contaminated clothing before reuse.

Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.
Ingestion: Immediately call a POISON CENTER or doctor/physician. Rinse mouth. Do NOT induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head positioned to avoid breathing in of vomit, rinse mouth and have victim drink plenty of water. Never give anything by mouth to an unconscious person.

Most Important Symptoms and Effects both Acute and Delayed

General: Causes eye irritation and respiratory tract irritation. Suspected of causing cancer.
Inhalation: Causes irritation to the respiratory tract. May be harmful if inhaled in high concentrations.
Skin Contact: May be irritating to the skin.
Eye Contact: Causes serious eye irritation.
Ingestion: May be harmful if swallowed. May cause cyanosis.
Chronic Symptoms: Causes damage to organs (thymus, liver, bone marrow) through prolonged or repeated exposure.

Indication of any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get IMMEDIATE medical advice and attention.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: DO NOT FIGHT FIRES INVOLVING EXPLOSIVES. Water may be applied through fixed extinguishing system (sprinklers) as long as people need not be present for the system to operate.
Unsuitable Extinguishing Media: DO NOT FIGHT FIRES INVOLVING EXPLOSIVES. Attempts to smother a fire involving this product will be ineffective as it is its own oxygen source. Smothering this product could lead to decomposition and explosion. This product is more sensitive to detonation if contaminated with organic or oxidisable material or if heated while confined. Unless the mass of product on fire is flooded with water, re-ignition is possible.

Special Hazards Arising from the Substance or Mixture

Fire Hazard: Not itself combustible but assists fire in burning materials (oxidizing). The product does not flash. Rate of burning: will accelerate burning. After fire has started, this product will continue to burn in the absence of air.
Explosion Hazard: Explosive. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.
Reactivity: Oxidizer- accelerates the rate of burning materials and will continue to burn in the absence of air.

Advice for Firefighters

Precautionary Measures Fire: This product is a high explosive with mass detonation hazard. DO NOT FIGHT FIRES INVOLVING EXPLOSIVE MATERIALS. Immediately evacuate all personnel from the area to a safe distance. Guard against re-entry. Thermal decomposition can lead to release of irritating gases and vapors.
Firefighting Instructions: DO NOT FIGHT FIRES INVOLVING EXPLOSIVE MATERIALS.
Protection During Firefighting: When controlling fire before involvement of explosives, fire-fighters should wear positive pressure self-containing breathing apparatus (SCBA) and full turnout gear.
Hazardous Combustion Products: Carbon oxides (CO, CO_2). Nitrous oxides. Ammonium nitrate fumes.

Reference to Other Sections

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Do not get in eyes, on skin, or on clothing. Do not breathe dust or fumes. Keep away from heat, sparks, open flames, hot surfaces – No smoking. Eliminate every possible source of ignition. Evacuate danger area.

For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).
Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Personnel

Protective Equipment: When controlling fire before involvement of explosives, emergency response personnel should wear positive pressure self-containing breathing apparatus (SCBA) and full turnout gear.
Emergency Procedures: Stop release is safe to do so. Eliminate ignition sources. Ventilate area.

Environmental Precautions
Prevent entry to sewers and public waters.

Methods and Material for Containment and Cleaning Up
For Containment: Avoid dust formation; wet spillage with water. Collect product for recovery or disposal. For release to land, contain discharge by constructing dykes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination. Collect contaminated soil and water, and absorbent for proper disposal. Notify applicable government authority if release is reportable or could adversely affect the environment.
Methods for Cleaning Up: Use only non-sparking tools. Avoid the use of metal tools containing iron, copper or brass. Be careful to avoid shock, friction, and contact with grit. Ground equipment electrically. Clear up spills immediately and dispose of waste safely.

Reference to Other Sections
Refer to section 8, Exposure Controls and Personal Protection.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling
Hygiene Measures: This product is an explosive and should only be used under the supervision of trained and licensed personnel. Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

Conditions for Safe Storage, Including any Incompatibilities
Technical Measures: Store as defined in the Explosives Act of Canada and the provisions of the Bureau of Alcohol, Tobacco and Firearms regulations contained in 27 CFR Part 555.
Storage Conditions: Store under moderate temperatures recommended by a technical services representative. Store under dry conditions in a well ventilated magazine that has been approved for either detonator storage or explosive storage. Do NOT store explosives in a detonator magazine or detonators in an explosive magazine. Keep away from heat, spark and flames. Keep containers closed. Explosives should be kept well away from initiating explosives; protected from physical damage; separated from oxidizing materials; combustibles, and sources of heat. Ideal storage temperature is 10-27°C (50-80°F).
Incompatible Materials: Combustibles, heat sources, copper, zinc, alloys of copper or zinc, aluminum powder, mild steel.
Special Rules on Packaging: Keep only in the original container.

Specific End Use(s)
Booster sensitive blasting agent and water resistant blasting agent. For professional use only.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

Ammonium nitrate (6484-52-2)		
ORICA Guideline	Internal TWA (mg/m³)	5 mg/m³

Fuels, diesel (68334-30-5)		
USA ACGIH	ACGIH TWA (mg/m³)	100 mg/m³
Alberta	OEL TWA (mg/m³)	100 mg/m³
British Columbia	OEL TWA (mg/m³)	100 mg/m³
Manitoba	OEL TWA (mg/m³)	100 mg/m³
Newfoundland & Labrador	OEL TWA (mg/m³)	100 mg/m³
Nova Scotia	OEL TWA (mg/m³)	100 mg/m³
Ontario	OEL TWA (mg/m³)	100 mg/m³
Prince Edward Island	OEL TWA (mg/m³)	100 mg/m³
Saskatchewan	OEL STEL (mg/m³)	150 mg/m³
Saskatchewan	OEL TWA (mg/m³)	100 mg/m³

Exposure Controls
Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in immediate vicinity of any potential exposure. Product to be handled under strictly controlled conditions. Observe applicable regulations in the Explosives Act of Canada and the provisions of the Bureau of Alcohol, Tobacco and Firearms regulations contained in 27 CFR Part 555.

Personal Protective Equipment: Gloves. Protective clothing. Respiratory protection. Safety Glasses or goggles.

Materials for Protective Clothing: Chemically resistant material.
Hand Protection: Wear chemically resistant protective gloves.
Eye Protection: Chemical goggles or safety glasses.
Skin and Body Protection: Wear suitable protective clothing. Wear long sleeves.
Respiratory Protection: Where Occupational Exposure Limits are expected to be exceeded, wear approved respiratory protection.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information On Basic Physical And Chemical Properties

Physical State	:	Solid
Appearance	:	Green, Blue, Gray, Orange, or Off-White Prills/Granuals
Odor	:	Smells like diesel fuel
Odor Threshold	:	Not available
pH	:	Not available
Relative Evaporation Rate (butyl acetate=1)	:	Not available
Melting Point	:	170°C (338°F)
Freezing Point	:	Not available
Boiling Point	:	Not available
Flash Point	:	52 °C (126 °F)
Auto-ignition Temperature	:	210-265°C (410-509°F)
Decomposition Temperature	:	Spontaneously decomposes at temperatures above 210°C (410°F)
Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	Not available
Upper Flammable Limit	:	Not available
Vapor Pressure	:	0.01 – 0.4 mmHg @ 20°C
Relative Vapor Density at 20 °C	:	Not available
Density	:	0.76 - 0.99 g/cc
Specific Gravity	:	Not available
Solubility	:	Dissolves slowly with prolonged exposure to water
Log Pow	:	Not available
Log Kow	:	Not available
Viscosity, Kinematic	:	Not available
Viscosity, Dynamic	:	Not available
Explosion Data - Sensitivity to Mechanical Impact	:	1.5D - Explosive substances and articles
Explosion Data - Sensitivity to Static Discharge	:	1.5D - Explosive substances and articles

SECTION 10: STABILITY AND REACTIVITY

Reactivity Accelerates the rate of burning materials. Oxidizer.
Chemical Stability Stable at standard temperature and pressure. Decomposes at elevated temperatures (>210°C/>410°F).
Possibility of Hazardous Reactions Hazardous polymerization will not occur.
Conditions to Avoid Extremely high or low temperatures. Open flame. Heat. Sparks.
Incompatible Materials Combustibles, heat sources, copper, zinc, alloys of copper or zinc, aluminum powder, mild steel.
Hazardous Decomposition Products Carbon oxides (CO, CO_2). Nitrous oxides. Ammonium nitrate fumes.

SECTION 11: TOXICOLOGICAL INFORMATION

Information On Toxicological Effects - Product

Acute toxicity : Not classified

LD50 and LC50 Data: Not available
Skin Corrosion/Irritation: Not classified
Serious Eye Damage/Irritation: Causes serious eye irritation.
Respiratory or Skin Sensitization: Not classified
Germ Cell Mutagenicity: Not classified
Teratogenicity: Not available
Carcinogenicity: Suspected of causing cancer.
Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs through prolonged or repeated exposure.
Reproductive Toxicity: Not classified
Specific Target Organ Toxicity (Single Exposure): May cause respiratory irritation.
Aspiration Hazard: Not classified
Symptoms/Injuries after Inhalation: Causes irritation to the respiratory tract. May be harmful if inhaled in high concentrations.
Symptoms/Injuries after Skin Contact: May be irritating to the skin.
Symptoms/Injuries after Eye Contact: Causes serious eye irritation.
Symptoms/Injuries after Ingestion: May be harmful if swallowed. May cause cyanosis.
Chronic Symptoms: Causes damage to organs (thymus, liver, bone marrow) through prolonged or repeated exposure.

Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data

Ammonium nitrate (6484-52-2)	
LD50 oral rat	2217 mg/kg
LC50 inhalation rat (mg/l)	> 88.8 mg/l (Exposure time: 4 h)

Fuels, diesel (68334-30-5)	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rabbit	> 2000 mg/kg
LC50 Inhalation Rat (mg/l)	4.6 mg/l/4h

Fuels, diesel (68334-30-5)	
IARC Group	2B

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Ammonium nitrate (6484-52-2)	
LC50 fish 1	65 - 85 mg/l (Exposure time: 48 h - Species: Cyprinus carpio [semi-static])

Fuels, diesel (68334-30-5)	
LC50 Fish 1	35 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])

Persistence and Degradability Not available

Bioaccumulative Potential

Ammonium nitrate (6484-52-2)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	-3.1 (at 25 °C)

Mobility in Soil Not available

Other Adverse Effects Not available

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Recommendations: Burn under supervision of a licensed expert at an explosive burning ground or destroy by detonation in boreholes, in accordance with applicable local, state, provincial, territorial, federal and international regulations. Comply with regulations as defined in the Explosives Act of Canada and the provisions of the Bureau of Alcohol, Tobacco and Firearms regulations contained in 27 CFR Part 555.
Ecology - Waste Materials: Hazardous waste due to aquatic toxicity.

SECTION 14: TRANSPORT INFORMATION

In Accordance with ICAO/IATA/DOT/TDG

UN Number

UN-No.(DOT): 0331

UN Proper Shipping Name

DOT Proper Shipping Name : Explosive, blasting, type B

Hazard Labels (DOT) : 1.5D - Explosive substances and articles

Packing Group (DOT) : II - Medium Danger

Additional Information

Emergency Response Guide (ERG) Number : 112

SECTION 15: REGULATORY INFORMATION

US Federal Regulations

Amex™, Amex™ UG, Amex™ WR	
SARA Section 311/312 Hazard Classes	Reactive hazard Sudden release of pressure hazard Delayed (chronic) health hazard Immediate (acute) health hazard

Ammonium nitrate (6484-52-2)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Fuels, diesel (68334-30-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

US State Regulations

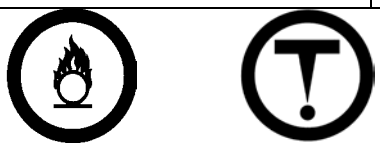
Ammonium nitrate (6484-52-2)
U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)
U.S. - Delaware - Accidental Release Prevention Regulations - Sufficient Quantities
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term

Fuels, diesel (68334-30-5)
U.S. - Illinois - Toxic Air Contaminant Carcinogens
U.S. - Illinois - Toxic Air Contaminants
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2

U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term

Canadian Regulations

Amex™, Amex™ UG, Amex™ WR	
WHMIS Classification	Class C - Oxidizing Material Class D Division 2 Subdivision B - Toxic material causing other toxic effects Class D Division 2 Subdivision A - Very toxic material causing other toxic effects



Ammonium nitrate (6484-52-2)	
Listed on the Canadian DSL (Domestic Substances List) inventory.	
WHMIS Classification	Class C - Oxidizing Material

Fuels, diesel (68334-30-5)
Listed on the Canadian DSL (Domestic Substances List) inventory.

Note: Explosives are not regulated under WHMIS. They are subject to the regulations of the Explosives Act of Canada.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION

Indication of Changes : 08/06/2013
Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

Acute Tox. 4 (Inhalation)	Acute toxicity (inhalation) Category 4
Asp. Tox. 1	Aspiration hazard Category 1
Carc. 2	Carcinogenicity Category 2
Expl. 1.5	Explosive Category 1.5
Eye Irrit. 2A	Serious eye damage/eye irritation Category 2A
Flam. Liq. 3	Flammable liquids Category 3
Ox. Sol. 3	Oxidizing solids Category 3
Skin Irrit. 2	Skin corrosion/irritation Category 2
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2
H205	May mass explode in fire
H226	Flammable liquid and vapor
H272	May intensify fire; oxidizer
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H319	Causes serious eye irritation
H332	Harmful if inhaled
H351	Suspected of causing cancer
H373	May cause damage to organs through prolonged or repeated exposure

Party Responsible for the Preparation of this Document:

Orica Canada Inc.

Phone Number: 1-450-533-4201

The information contained herein is provided only as a guide for the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. This Material Safety Data Sheet is not all-inclusive. The circumstances of use and handling may involve additional considerations that have not been addressed by this Data Sheet. No warranty of any kind is provided or implied by this Data Sheet. Orica will not be liable for any damages, losses, injuries or indirect damages that may result from the use of, or reliance on, any information contained herein.

North America GHS US 2012 & WHMIS

SAFETY DATA SHEET **SDS No.:** AA0295 **OXIDIZER STORAGE CODE YELLOW**

Section 1 Chemical Product and Company Information

5100 West Henrietta Rd
PO Box 92912
Rochester, NY 14692-9012
Tel: (800) 962-2660

CHEMTREC 24 Hour Emergency
Phone Number (800) 424-9300
For laboratory use only.
Not for drug, food or household use.

Product	**AMMONIUM NITRATE**
Synonyms	Nitric Acid Ammonium Salt

Section 2 Hazards Identification

This substance or mixture has not been classified as hazardous according to the Globally Harmonized System (GHS) of Classification and Labeling of Chemicals.

Signal word: WARNING
Pictograms: GHS03 / GHS07
Target organs: Liver, Kidneys, Blood

GHS Classification:
Oxidizing solid (Category 3)
Acute toxicity, oral (Category 5)
Skin irritation (Category 2)
Eye irritation (Category 2A)

GHS Label information: **Hazard statement(s):**
H272: May intensify fire; oxidizer.
H303: May be harmful if swallowed.
H315: Causes skin irritation.
H319: Causes serious eye irritation.

Precautionary statement(s):
P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P220: Keep away from clothing/incompatible/combustible materials.
P221: Take any precaution to avoid mixing with combustibles/acids/oxidizers.
P264: Wash hands thoroughly after handling.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P312: Call a POISON CENTER or doctor if you feel unwell.
P302+P352: IF ON SKIN: Wash with plenty of water and soap.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P332+P313: If skin irritation occurs: Get medical attention.
P337+P313: If eye irritation persists: Get medical attention.
P362+P364: Take off contaminated clothing and wash it before reuse.
P370+P378: In case of fire: Use dry chemical, alcohol foam, carbon dioxide or water spray to extinguish.
P501: Dispose of contents/container to a licensed chemical disposal agency in accordance with local/regional/national regulations.

Ca Prop 65 - This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

Section 3 Composition / Information on Ingredients

Chemical Name	CAS #	%	EINECS
Ammonium nitrate	6484-52-2	100%	229-347-8

Section 4 First Aid Measures

INGESTION: MAY BE HARMFUL IF SWALLOWED. Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: MAY BE HARMFUL IF INHALED. MAY CAUSE RESPIRATORY TRACT IRRITATION. Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: CAUSES EYE IRRITATION. Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN ABSORPTION: CAUSES SKIN IRRITATION. Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures

Suitable Extinguishing Media: Carbon dioxide, dry chemical, dry sand, alcohol foam. **Protective Actions for Fire-fighters:** In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. Use water spray to keep fire-exposed containers cool. **Specific Hazards:** During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Strong oxidizer. If heated under confinement, material may explode. Ammonium nitrate of any grade, including fertilizer, when contaminated with oil, charcoal or other organic materials should be considered an explosive capable of dentonation by combustion or by explosion of adjacent explosive materials. Combustion by-products include oxides of nitrogen and ammonia. Closed containers may rupture violently when heated.

Section 6 Accidental Release Measures

Personal Precautions: Evacuate personnel to safe area. Use proper personal protective equipment as indicated in Section 8. Provide adequate ventilation.

Environmental Precautions: Avoid runoff into storm sewers and ditches which lead to waterways.

Containment and Cleanup: Remove all sources of ignition. Sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water.

(2012 EMERGENCY RESPONSE GUIDEBOOK, (PHH50-ERG2012), GUIDE # 140)

Section 7 Handling & Storage

Precautions for Safe Handling: Read label on container before using. Do not wear contact lenses when working with chemicals. Keep out of reach of children. Avoid contact with eyes, skin and clothing. Do not inhale dusts. Use with adequate ventilation. Avoid ingestion. Wash thoroughly after handling. Remove and wash clothing before reuse.

Conditions for Safe Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from ignition sources.

Section 8 Exposure Controls / Personal Protection

Exposure Limits:

Chemical Name	ACGIH (TLV)	OSHA (PEL)	NIOSH (REL)
Particulates not otherwise classified/regulated	None established.	TWA: 5 mg/m^3 Respirable fraction	None established.

Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: None should be needed in normal laboratory handling at room temperatures. If dusty conditions prevail, work in fume hood or wear a NIOSH/MSHA-approved respirator.

Section 9 Physical & Chemical Properties

Appearance: Hygroscopic solid. White granules
Odor: No odor.
Odor threshold: Data not available.
pH: 5.4
Melting / Freezing point: 169°C (338°F)
Boiling point: Decomposes
Flash point: Data not available

Evaporation rate (= 1): Data not available
Flammability (solid/gas): Data not available.
Explosion limits: Lower / Upper: Data not available
Vapor pressure (mm Hg): Data not available
Vapor density (Air = 1): Data not available
Relative density (Specific gravity): 1.73 @ 23°C
Solubility(ies): 118 g/100 g water @ 30°C

Partition coefficient: Data not available
Auto-ignition temperature: Data not available
Decomposition temperature: 210°C (410°F)
Viscosity: Data not available.
Molecular formula: NH_4NO_3
Molecular weight: 80.05

Section 10 Stability & Reactivity

Chemical stability: Stable
Hazardous polymerization: Will not occur.
Conditions to avoid: Excessive temperatures and other sources of ignition. Combustible and organic materials.

Incompatible materials: Peroxides, strong oxidizers, reducing agents, organic materials.

Hazardous decomposition products: Nitrogen oxides.

Section 11 Toxicological Information

Acute toxicity: Oral-rat LD50: 2217 mg/kg ; Inhalation-rat LC50: >88.8 mg/L/4 hours [Ammonium nitrate]
Skin corrosion/irritation: Data not available
Serious eye damage/irritation: Data not available
Respiratory or skin sensitization: Data not available
Germ cell mutagenicity: Data not available
Carcinogenity: Data not available
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
Reproductive toxicity: Data not available
STOT-single exposure: Data not available
STOT-repeated exposure: Data not available
Aspiration hazard: Data not available
Potential health effects:
Inhalation: Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath.
Ingestion: May cause gastroenteritis and abdominal pains. Purging and diuresis can be expected. Rare cases of nitrates being converted to the more toxic nitrites have been reported, mostly with infants.
Skin: Causes irritation to skin. Symptoms include redness, itching, and pain.
Eyes: Causes irritation, redness, and pain.
Signs and symptoms of exposure: Small repeated oral doses of nitrates may cause weakness, depression, headache, and mental impairment. Persons with stomach diseases and infants are much more sensitive to nitrate ion toxicity.
Additional information: RTECS #: BR9050000 [Ammonium nitrate]

Section 12 Ecological Information

Toxicity to fish: Cyprinus carpio (Fish, fresh water) LC50: 74 mg/L/48 hours
Toxicity to daphnia and other aquatic invertebrates: Daphnia magna (Crustacea) EC50: 555 mg/L
Toxicity to algae: Scenedesmus quadricauda (Algae) EC50: 83 mg/L
Persistence and degradability: No data available
Bioaccumulative potential: No data available
Mobility in soil: No data available
PBT and vPvB assessment: No data available
Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Section 13 Disposal Considerations

These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local, state and federal regulations or contract with a licensed chemical disposal agency.

Section 14 Transport Information

UN/NA number: UN1942
Shipping name: Ammonium nitrate
Hazard class: 5.1
Packing group: III
Reportable Quantity: No
Marine pollutant: No
Exceptions: Limited quantity equal to or less than 5 Kg
2012 ERG Guide # 140

Section 15 Regulatory Information

A chemical is considered to be listed if the CAS number for the anhydrous form is on the Inventory list.

Component	TSCA	CERLCA (RQ)	RCRA code	DSL	NDSL	WHMIS Classification
Ammonium nitrate	Listed	Not listed	Not listed	Listed	Not listed	 C

Section 16 Additional Information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. NTP: National Toxicology Program, IARC: International Agency for Research on Cancer, OSHA: Occupational Safety and Health Administration, STOT: Specific Target Organ Toxicity, SE: Single Exposure, RE: Repeated Exposure, ERG: Emergency Response Guidebook.

Revision Date: February 26, 2013 **Supercedes:** November 22, 2011

SAFETY DATA SHEET

Revision Date: 02/17/2015
Print Date: 9/28/2015
MSDS Number: R0294485
Version: 3.2

Zalta™ MA11-751 ANTISCALANT
™ Trademark, Solenis or its subsidiaries or affiliates, registered in various countries
784892

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Solenis LLC 500 Hercules Road Wilmington, Delaware 19808	Contact us at	www.solenis.com
	Emergency telephone number	1-844-SOLENIS (844-765-3647) / 606-329-5705
Product name	Zalta™ MA11-751 ANTISCALANT ™ Trademark, Solenis or its subsidiaries or affiliates, registered in various countries	
Product code	784892	

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance: liquid, yellow

CAUTION! MAY CAUSE EYE IRRITATION.

Potential Health Effects

Exposure routes
Inhalation, Skin absorption, Skin contact, Eye Contact, Ingestion

Eye contact
Can cause eye irritation. Symptoms include stinging, tearing, redness, and swelling of eyes.

Skin contact
May cause slight skin irritation.

Ingestion
Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

Inhalation
Breathing of vapor or mist is possible. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms are not expected at air concentrations below the recommended exposure limits, if applicable (see Section 8.).

Aggravated Medical Condition
Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material:, lung (for example, asthma-like conditions), Kidney

Symptoms

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:, stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), thirst

Target Organs

Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans:, kidney damage

Carcinogenicity

This material is not listed as a carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA).

Reproductive hazard

No data.

Other information

Swallowing or other exposure to large amounts of sodium chloride may cause death due to loss of water in internal organs.

3. COMPOSITION/INFORMATION ON INGREDIENTS

WHMIS hazardous composition: No ingredients are hazardous according to the CPR criteria.

4. FIRST AID MEASURES

Eyes

If symptoms develop, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate medical attention.

Skin

Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Ingestion

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation

If symptoms develop, move individual away from exposure and into fresh air. If symptoms persist, seek medical attention. If breathing is difficult, administer oxygen. Keep person warm and quiet; seek immediate medical attention.

Notes to physician

Hazards: No information available.
Treatment: No hazards which require special first aid measures.

5. FIREFIGHTING MEASURES

Suitable extinguishing media

Dry chemical, Carbon dioxide (CO2), Water spray

Hazardous combustion products

carbon dioxide and carbon monoxide, corrosive vapors, hydrogen chloride, phosphine, Oxides of phosphorus, Sodium oxides, toxic fumes

Precautions for fire-fighting

Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA). Use water spray to cool fire exposed containers and structures until fire is out if it can be done with minimal risk. Avoid spreading burning material with water used for cooling purposes.

NFPA Flammable and Combustible Liquids Classification

Not applicable

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

For personal protection see section 8. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.

Environmental precautions

Prevent spreading over a wide area (e.g. by containment or oil barriers). Do not let product enter drains. Do not flush into surface water or sanitary sewer system.

Methods for cleaning up

Keep in suitable, closed containers for disposal. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

Other information

Comply with all applicable federal, state, and local regulations.

7. HANDLING AND STORAGE

Handling

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed.

Storage

Store in a cool, dry, ventilated area. Keep from freezing.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Contains no substances with occupational exposure limit values.

General advice

These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities.

Exposure controls

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects.

Eye protection

Wear chemical splash goggles when there is the potential for exposure of the eyes to liquid, vapor or mist.

Skin and body protection

Wear normal work clothing including long pants, long-sleeved shirts and foot covering to prevent direct contact of the product with the skin. Launder clothing before reuse. If skin irritation develops, contact your facility health and safety professional or your local safety equipment supplier to determine the proper personal protective equipment for your use.
Wear resistant gloves (consult your safety equipment supplier).

Respiratory protection

A NIOSH-approved air-purifying respirator with an appropriate cartridge and/or filter may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits (if applicable) or if overexposure has otherwise been determined. 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 not known or any other circumstances where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	liquid
Colour	yellow, brown
Odour	acrylic-like
Boiling point/boiling range	212 °F / 100 °C @ 1,013.33 hPa Calculated Phase Transition Liquid/Gas
Melting point/range	6 °F / -14 °C

pH	5
Flash point	Not applicable
Evaporation rate	(>)1 Ethyl Ether
Vapour pressure	23.333 hPa @ 68 °F / 20 °C Calculated Vapor Pressure
Relative vapour density	(>)1 AIR=1
Density	1.260 g/cm3 @ 77.00 °F / 25.00 °C
Water solubility	completely soluble

10. STABILITY AND REACTIVITY

Stability
Stable.

Conditions to avoid
None known.

Incompatible products
Oxidizing agents, Strong acids Oxidizing agents, strong mineral acids

Hazardous decomposition products
carbon dioxide and carbon monoxide, corrosive vapors, hydrogen chloride, phosphine, Oxides of phosphorus, Sodium oxides

Hazardous reactions
Product will not undergo hazardous polymerization.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Inhalation
Skin absorption
Skin contact
Eye Contact
Ingestion

Product

Acute oral toxicity : No data available

Acute inhalation toxicity : No data available

Acute dermal toxicity	:	No data available
Skin corrosion/irritation	:	No data available
Serious eye damage/eye irritation	:	No data available
Respiratory or skin sensitisation	:	No data available
Target Organ Systemic Toxicant - Repeated exposure	:	Target Organs: Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans:, kidney damage
Aspiration toxicity	:	No aspiration toxicity classification

Components:

No data available

12. ECOLOGICAL INFORMATION

Ecotoxicity
Product:

Toxicity to fish	:	LC 50 (Oncorhynchus mykiss (rainbow trout)): 7,070 mg/l Exposure time: 96 h Test Method: static test LC 50 (Pimephales promelas (fathead minnow)): 6,160 mg/l Exposure time: 96 h Test Method: static test
Toxicity to daphnia and other aquatic invertebrates	:	LC 50 (Daphnia magna (Water flea)): 2,020 mg/l Exposure time: 48 h Test Method: static test

Components:

No data available

Persistence and degradability

Product:

Biochemical Oxygen Demand (BOD)	:	Biochemical oxygen demand within 5 days 1,600 mg/l
Chemical Oxygen Demand (COD)	:	200,000 mg/l Method: Chemical oxygen demand

Components:

No data available

Bioaccumulative potential

Product:

No data available

Components:

No data available

Mobility in soil

Product:

No data available

Components:

No data available

13. DISPOSAL CONSIDERATIONS

Waste disposal methods

Dispose of in accordance with all applicable local, state and federal regulations.

14. TRANSPORT INFORMATION

REGULATION

ID NUMBER	PROPER SHIPPING NAME	*HAZARD CLASS	SUBSIDIARY HAZARDS	PACKING GROUP	MARINE POLLUTANT / LTD. QTY.

U.S. DOT - ROAD

Not dangerous goods

U.S. DOT - RAIL

Not dangerous goods

U.S. DOT - INLAND WATERWAYS

Not dangerous goods

TRANSPORT CANADA - ROAD

Not dangerous goods

TRANSPORT CANADA - RAIL

Not dangerous goods

TRANSPORT CANADA - INLAND WATERWAYS

Not dangerous goods

INTERNATIONAL MARITIME DANGEROUS GOODS

Not dangerous goods

INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO

Not dangerous goods

INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER

Not dangerous goods

MEXICAN REGULATION FOR THE LAND TRANSPORT OF HAZARDOUS MATERIALS AND WASTES

Not dangerous goods

***ORM = ORM-D, CBL = COMBUSTIBLE LIQUID**

Dangerous goods descriptions (if indicated above) may not reflect quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

15. REGULATORY INFORMATION

WHMIS Classification

Not Rated

WHMIS Ingredient Disclosure List IDL: No component is listed on the WHMIS ingredients disclosure list.

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

Canadian National Pollutant Release Inventory (NPRI) Canadian National Pollutant Release Inventory (NPRI): No component is listed on NPRI.

Notification status

US. Toxic Substances Control Act	y (positive listing)
Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can. Gaz. Part II, Vol. 133)	y (positive listing)
Australia. Industrial Chemical (Notification and Assessment) Act	y (positive listing)
Japan. ENCS - Existing and New Chemical Substances Inventory	n (Negative listing)
Korea. Toxic Chemical Control Law (TCCL) List	y (positive listing)
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	y (positive listing)
China. Inventory of Existing Chemical Substances	y (positive listing)

	HMIS	NFPA
Health	2*	2
Flammability	0	0
Physical hazards	0	
Instability		0
Specific Hazard	--	--

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by the Solenis Environmental Health and Safety Department.

List of abbreviations and acronyms that could be, but not necessarily are, used in this safety data sheet :
ACGIH : American Conference of Industrial Hygienists
BEI : Biological Exposure Index
CAS : Chemical Abstracts Service (Division of the American Chemical Society).
CMR : Carcinogenic, Mutagenic or Toxic for Reproduction

FG : Food grade
GHS : Globally Harmonized System of Classification and Labeling of Chemicals.
H-statement : Hazard Statement
IATA : International Air Transport Association.
IATA-DGR : Dangerous Goods Regulation by the “International Air Transport Association” (IATA).
ICAO : International Civil Aviation Organization
ICAO-TI (ICAO) : Technical Instructions by the “International Civil Aviation Organization”
IMDG : International Maritime Code for Dangerous Goods
ISO : International Organization for Standardization
logPow : octanol-water partition coefficient
LCxx : Lethal Concentration, for xx percent of test population
LDxx : Lethal Dose, for xx percent of test population.
ICxx : Inhibitory Concentration for xx of a substance
Ecxx : Effective Concentration of xx
N.O.S.: Not Otherwise Specified
OECD : Organization for Economic Co-operation and Development
OEL : Occupational Exposure Limit
P-Statement : Precautionary Statement
PBT : Persistent , Bioaccumulative and Toxic
PPE : Personal Protective Equipment
STEL : Short-term exposure limit
STOT : Specific Target Organ Toxicity
TLV : Threshold Limit Value
TWA : Time-weighted average
vPvB : Very Persistent and Very Bioaccumulative
WEL : Workplace Exposure Level

CERCLA : Comprehensive Environmental Response, Compensation, and Liability Act
DOT : Department of Transportation
FIFRA : Federal Insecticide, Fungicide, and Rodenticide Act
HMIRC : Hazardous Materials Information Review Commission
HMIS : Hazardous Materials Identification System
NFPA : National Fire Protection Association
NIOSH : National Institute for Occupational Safety and Health
OSHA : Occupational Safety and Health Administration
PMRA : Health Canada Pest Management Regulatory Agency
RTK : Right to Know
WHMIS : Workplace Hazardous Materials Information System

Material Safety Data Sheet

LA2569
Copper Sulphate

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Id: LA2569
Product Name: Copper Sulphate
Synonyms: Copper (II) Sulphate Pentahydrate, Blue Vitrol; Cupric Sulphate Pentahydrate.
Chemical Family: Inorganic copper compound
Application: Mineral flotation. Also, where licensed and labeled correctly it can be used as an animal feed micronutrient or a fungicide or algaecide.

Distributed By:
Univar Canada Ltd.
9800 Van Horne Way
Richmond, BC
V6X 1W5

Prepared By: The Environment, Health and Safety Department of Univar Canada Ltd.
Preparation date of MSDS: 29/Sep/2014
Telephone number of preparer: 1-866-686-4827

24-Hour Emergency Telephone Number (CANUTEC): (613) 996-6666

2. HAZARDS IDENTIFICATION

Potential Acute Health Effects:
Eye Contact: May cause severe eye irritation. May cause clouding of the cornea.
Skin Contact: May cause skin irritation. May be harmful if absorbed through skin. Repeated or prolonged contact may cause irritation.
Inhalation: May be harmful if inhaled. May cause respiratory tract irritation. May cause ulceration of the nose and throat.
Ingestion: May be harmful if swallowed. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients	Percentage (W/W)	LD50s and LC50s Route & Species:
Copper Sulphate 7758-98-7	98-100	Dermal LD50 Rabbit = 1000 mg/kg Oral LD50 Rat = 300 mg/kg

Note: Pentahydrate CAS#: 7758-99-8

4. FIRST AID MEASURES

Eye Contact: Immediately flush eyes with copious quantities of water for at least 20 minutes holding lids apart to ensure flushing of the entire surface. Seek immediate medical attention.
Skin Contact: Remove contaminated clothing and launder before reuse. Wash with soap and water. Get medical attention if irritation persists.
Inhalation: Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.
Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs.
Notes to Physician: Treatment based on sound judgment of physician and individual reactions of patient.

5. FIRE FIGHTING MEASURES

Flash Point: None.
Flash Point Method: Not applicable.
Autoignition Temperature: Not available.
Flammable Limits in Air (%): Not Available.
Extinguishing Media: Use extinguishing media appropriate for surrounding fire.
Special Exposure Hazards: Not Available.
Hazardous Decomposition/Combustion Materials (under fire conditions): Not available.
Special Protective Equipment: Fire fighters should wear full protective clothing, including self-contained breathing equipment.
NFPA RATINGS FOR THIS PRODUCT ARE: HEALTH 2, FLAMMABILITY 0, INSTABILITY 0
HMIS RATINGS FOR THIS PRODUCT ARE: HEALTH 2, FLAMMABILITY 0, REACTIVITY 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures: Wear appropriate protective equipment.
Environmental Precautionary Measures: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Consult local authorities.
Procedure for Clean Up: Isolate hazard area and restrict access. Ventilate area. Pick up solids and put in an appropriate sealed container for later disposal.

7. HANDLING AND STORAGE

Handling: Avoid contact with eyes, skin and clothing. Avoid breathing in dust. Wash thoroughly after handling.
Storage: Store in an area that is cool and dry. Protect against physical damage. Store in accordance with good industrial practices.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:

Localized ventilation should be used to control dust levels.
Respiratory Protection: If exposure exceeds occupational exposure limits, use an appropriate NIOSH approved respirator. In case of spill or leak resulting in unknown concentration, use a NIOSH approved supplied air respirator.
Gloves:

Impervious gloves. Rubber gloves.
Skin Protection: Impervious clothing. Apron, coveralls and/or other resistant protective clothing.
Eyes: Safety glasses. Goggles.
Other Personal Protection Data: Ensure that eyewash stations and safety showers are proximal to the work-station location.

Ingredients	Exposure Limit - ACGIH	Exposure Limit - OSHA	Immediately Dangerous to Life or Health - IDLH
Copper Sulphate	Not available.	Not available.	Not Available.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid Crystals or Powder
Color: Blue

9. PHYSICAL AND CHEMICAL PROPERTIES

Odor: Odorless
pH 4
Specific Gravity: 2.286
Boiling Point: Not Available.
Freezing/Melting Point: Copper sulfate pentahydrate loses two water molecules of hydration at 30°C, 2 more at 110°C and becomes anhydrous by 250°C. Melts at 110°C. Decomposes at 560°C.
Vapor Pressure: Not Available.
Vapor Density: Not Available.
% Volatile by Volume: Not Available.
Evaporation Rate: Not Available.
Solubility: Soluble in water.
VOCs: Not Available.
Viscosity: Not Available.
Molecular Weight: 249.68
Other: Not Available.

10. STABILITY AND REACTIVITY

Chemical Stability: Stable.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Heating to decomposition. Incompatible materials.
Materials to Avoid: Magnesium. Hydroxylamine.
Hazardous Decomposition Products: Oxides of sulphur. Toxic fumes.
Additional Information:

Solution can react with magnesium to evolve hydrogen. Contact with hydroxylamine will ignite hydroxylamine. When dissolved, forms acidic solution which is corrosive to most metals. Copper dust or mist may react with acetylene gas to form shock sensitive copper acetylides.

11. TOXICOLOGICAL INFORMATION

Principle Routes of Exposure

Ingestion: May be harmful if swallowed. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns.
Skin Contact: May cause skin irritation. May be harmful if absorbed through skin. Repeated or prolonged contact may cause irritation.
Inhalation: May be harmful if inhaled. May cause respiratory tract irritation. May cause ulceration of the nose and throat.
Eye Contact: May cause severe eye irritation. May cause clouding of the cornea.

Additional Information: Prolonged skin contact may cause irritation and eczema.

Acute Test of Product:
Acute Oral LD50: Not Available.
Acute Dermal LD50: Not Available.
Acute Inhalation LC50: Not Available.

Carcinogenicity:

Ingredients	IARC - Carcinogens	ACGIH - Carcinogens
Copper Sulphate	Not listed.	Not listed.

Carcinogenicity Comment: No additional information available.

Reproductive Toxicity/ Teratogenicity/ Embryotoxicity/ Mutagenicity: Not Available.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

Ingredients	Ecotoxicity - Fish Species Data	Acute Crustaceans Toxicity:	Ecotoxicity - Freshwater Algae Data
Copper Sulphate	0.1 mg/L LC50 (Oncorhynchus mykiss) 96 h	Not Available.	Not Available.

Other Information:
No additional remark.

13. DISPOSAL CONSIDERATIONS

Disposal of Waste Method: Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations.
Contaminated Packaging: Empty containers should be recycled or disposed of through an approved waste management facility.

14. TRANSPORT INFORMATION

DOT (U.S.):
DOT Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE SOLID, N.O.S (COPPER SULPHATE)
DOT Hazardous Class 9
DOT UN Number: UN3077
DOT Packing Group: III
DOT Reportable Quantity (lbs): Not Available.
Note: No additional remark.
Marine Pollutant: Yes.

TDG (Canada):
TDG Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (COPPER SULPHATE)
Hazard Class: 9
UN Number: UN3077
Packing Group: III
Note: Regulated for marine transportation only, if transported by road or rail product is not TDG Regulated.
Marine Pollutant: Yes.

15. REGULATORY INFORMATION

U.S. TSCA Inventory Status: All components of this product are either on the Toxic Substances Control Act (TSCA) Inventory List or exempt.

Canadian DSL Inventory Status: All components of this product are either on the Domestic Substances List (DSL), the Non-Domestic Substances List (NDSL) or exempt.

Note: Not available.

U.S. Regulatory Rules

Ingredients	CERCLA/SARA - Section 302:	SARA (311, 312) Hazard Class:	CERCLA/SARA - Section 313:
Copper Sulphate	Not Listed.	Listed	Not Listed.

California Proposition 65: Not Listed.
MA Right to Know List: Listed.
New Jersey Right-to-Know List: Listed.
Pennsylvania Right to Know List: Listed.

WHMIS Hazardous Class:
D1B TOXIC MATERIALS
D2B TOXIC MATERIALS

16. OTHER INFORMATION

Additional Information: This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Disclaimer: NOTICE TO READER:
Univar, expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from your local Univar Sales Office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.

*****END OF MSDS*****

Material Safety Data Sheet

B-975

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	B-975
Product Identifier	B-975
MSDS No.	Product 002
Product Family	Degreasers
Manufacturer	Supersaul Chemmex Inc., 56022 Range Road 14, Onoway, Alberta, T0E-1V0, 780-266-4414, www.supersaulchemmex.com
Supplier	Supersaul Chemmex Inc., 56022 Range Road 14, Onoway, Alberta, T0E-1V0, 780-266-4414, www.supersaulchemmex.com
Emergency Contact Information	Supersaul Chemmex Inc., 780-266-4414
Use	Degreaser

2. HAZARDS IDENTIFICATION

Emergency Overview	Clear yellow - orange viscous liquid. Sweet odour. Presents little or no hazard if accidentally released. Will not burn.

Potential Health Effects

Route of Exposure	Inhalation. Skin contact. Skin absorption. Eye contact. Ingestion.
Inhalation	Can irritate the nose and throat.
Skin Contact	May cause mild irritation.
Eye Contact	May cause mild irritation.
Ingestion	Can cause effects as described for skin contact.
Effects of Long-Term (Chronic) Exposure	Effect(s) from long-term exposure are similar to effects described for short-term exposure.
Carcinogenicity	Not known to cause cancer.
Teratogenicity / Embryotoxicity	Not known to harm the unborn child.
Reproductive Toxicity	Not known to be a reproductive hazard.
Mutagenicity	Not known to be a mutagen.

Potential Environmental Effects

Biodegrades with exposure to air. with exposure to microorganisms in soil, water or sediment.
Product and/or byproducts are not likely to bioaccumulate.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Contains no hazardous ingredients.

4. FIRST AID MEASURES

First Aid Procedures

Inhalation	Move victim to fresh air. Call a Poison Centre or doctor if the victim feels unwell.
Skin Contact	Flush with lukewarm, gently flowing water for 5 minutes. Clean clothing, shoes and leather goods. Call a Poison Centre or doctor if the victim feels unwell.
Eye Contact	Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 5 minutes, while holding the eyelid(s) open. If irritation or pain persists, see a doctor.
Ingestion	Have victim rinse mouth with water. Call a Poison Centre or doctor if the victim feels unwell.

5. FIRE FIGHTING MEASURES

Flammable Properties	Does not burn.
Suitable Extinguishing Media	Not combustible. Use extinguishing agent suitable for surrounding fire.
Unsuitable Extinguishing Media	Not applicable.
Specific Hazards Arising from the Chemical	This product presents no unusual hazards in a fire situation. Not known to generate any hazardous decomposition products in a fire.
Protective Equipment and Precautions for Firefighters	No special precautions are necessary. Chemical protective clothing (e.g. chemical splash suit) and positive pressure SCBA may be necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	No special precautions are necessary. Use the Personal Protective Equipment recommended in Section 8 of this MSDS.
Environmental Precautions	No special precautions are necessary. It is good practice to prevent releases into the environment.
Methods for Containment and Clean-up	No special clean-up methods are necessary. Stop or reduce leak if safe to do so. Contain and soak up spill with absorbent that does not react with spilled product.
Other Information	Report spills to local health, safety and environmental authorities, as required.

7. HANDLING AND STORAGE

Handling	No special handling precautions are necessary. Prevent uncontrolled release of product. Avoid generating vapours or mists. If product is transferred to another container, ensure new container is suitable for the product.
Storage	Store in an area that is: ventilated. Comply with all applicable health and safety regulations, fire and building codes.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Not available.

Exposure Guideline Comments	ACGIH® = American Conference of Governmental Industrial Hygienists. A4 = Not classifiable as a human carcinogen. Consult local authorities for provincial or state exposure limits.

	OSHA = US Occupational Safety and Health Administration. Consult local authorities for provincial or state exposure limits. AIHA = American Industrial Hygiene Association. Consult local authorities for provincial or state exposure limits.
Engineering Controls	The hazard potential of this product is relatively low. General ventilation is usually adequate.

Personal Protective Equipment (PPE)

Eye/Face Protection	Not required but it is good practice to wear safety glasses or chemical safety goggles.
Skin Protection	Not required. Avoid repeated or prolonged skin contact.
Respiratory Protection	Not normally required if product is used as directed.
General Hygiene Considerations	No special precautions are necessary. It is good practice to: avoid breathing product; avoid skin and eye contact and wash hands after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Clear yellow - orange viscous liquid.
Particle Size	Not applicable
Odour	Sweet
Odour Threshold	Not available
Molecular Formula	Not applicable
Molecular Weight	Not applicable
Boiling Point	104 ºC (219 ºF)
Decomposition Temperature	Not available
Melting Point	Not applicable
Freezing Point	-5 ºC (23 ºF)
Relative Density (water = 1)	1.024
Bulk Density	Not available
Solubility in Water	Soluble in all proportions.
Solubility in Other Liquids	Soluble in all proportions in acids (e.g. acetic acid).
pH	7.3 - 7.9 (100% solution)
Partition Coefficient, n-Octanol/Water	Not available
Viscosity-Kinematic	Not available
Surface Tension	Not available
Vapour Pressure	Not available
Vapour Pressure at 50 deg C	Not available
Saturated Vapour Concentration	Not available
Critical Temperature	Not applicable
Vapour Density (air = 1)	Not applicable
Evaporation Rate	Not available
Flash Point	Not applicable
Lower Flammable/Explosive Limit	Not applicable
Upper Flammable/Explosive Limit	Not applicable

Auto-ignition Temperature	Not applicable
Electrical Conductivity	Not available

10. STABILITY AND REACTIVITY

Chemical Stability	Normally stable.
Conditions to Avoid	None known.
Incompatible Materials	None known.
Hazardous Decomposition Products	None known.
Possibility of Hazardous Reactions	None known.

11. TOXICOLOGICAL INFORMATION

LC50: No information was located.

LD50 (oral): No information was located.

LD50 (dermal): No information was located.

Skin Irritation / Corrosion

No information was located.

Eye Irritation / Corrosion

No information was located.

Effects of Short-Term (Acute) Exposure

Inhalation

No information was located.

Skin Absorption

No information was located.

Ingestion

No information was located.

Effects of Long-Term (Chronic) Exposure

No information was located.

Respiratory and/or Skin Sensitization

Not a respiratory sensitizer.
Not a skin sensitizer.

Carcinogenicity

IARC:
Not specifically listed.

ACGIH®:
Not specifically designated.

NTP:
Not specifically listed.

OSHA:
Not specifically listed.

Key to Abbreviations

ACGIH® = American Conference of Governmental Industrial Hygienists.
IARC = International Agency for Research on Cancer.

NTP = National Toxicology Program.
OSHA = US Occupational Safety and Health Administration.

Teratogenicity / Embryotoxicity

No information was located.

Reproductive Toxicity

No information was located.

Mutagenicity

No information was located.

Toxicologically Synergistic Materials

No information was located.

12. ECOLOGICAL INFORMATION

General Comments	This section is not required by WHMIS. This section is not required by OSHA.
Ecotoxicity	Studies were not located.
Persistence and Degradability	No ingredient of this product or its degradation products is known to be highly persistent. Biodegrades with exposure to air. in water. in soil and sediment.
Bioaccumulation / Accumulation	No information was located.
Mobility	Studies are not available.

13. DISPOSAL CONSIDERATIONS

This product is a non-hazardous waste.
Recycle and reuse product, if possible.
Recommended disposal methods are for the product, as sold. (Used material may contain other hazardous contaminants.)
The required hazard evaluation of the waste and compliance with the applicable hazardous waste laws are the responsibility of the user.

14. TRANSPORT INFORMATION

Shipping Information

Not regulated under Canadian TDG Regulations. Not regulated under US DOT Regulations.

Other Transport Information

Special Shipping Information	Not applicable

15. REGULATORY INFORMATION

Canada

WHMIS Classification

Not a WHMIS controlled product.

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

Domestic Substances List (DSL) / Non-Domestic Substances List (NDSL)

All ingredients are listed on the DSL or are not required to be listed.

USA

US OSHA Regulatory Status

This material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Toxic Substances Control Act (TSCA) Section 8(b)
All ingredients are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.

16. OTHER INFORMATION

NFPA Rating	Health - Not assigned. Flammability - Not assigned. Instability - Not assigned.
MSDS Prepared By	Supersaul Chemmex Inc.
Phone No.	780-266-4414
Date of Preparation	April 15, 2013
Key to Abbreviations	ACGIH® = American Conference of Governmental Industrial Hygienists AIHA = American Industrial Hygiene Association HSDB® = Hazardous Substances Data Bank IARC = International Agency for Research on Cancer NFPA = National Fire Prevention Association NIOSH = National Institute for Occupational Safety and Health NTP = National Toxicology Program OSHA = US Occupational Safety and Health Administration RTECS® = Registry of Toxic Effects of Chemical Substances
References	CHEMINFO database. Canadian Centre for Occupational Health and Safety (CCOHS). HSDB® database. US National Library of Medicine. Available from Canadian Centre for Occupational Health and Safety (CCOHS). Registry of Toxic Effects of Chemical Substances (RTECS®) database. Symyx Software, Inc. Available from Canadian Centre for Occupational Health and Safety (CCOHS). NIOSH Pocket Guide database. National Institute for Occupational Safety and Health. Available from Canadian Centre for Occupational Health and Safety (CCOHS).
Disclaimer	Note: The above information is presented in good faith and is believed to be accurate as of the effective/revision date shown. No warranty is expressed, applied or implied. Regulatory requirements are subject to change and may very from one location to another. It is the buyers responsibility to ensure that its' activities comply with currant federal, state or provincial, and local requirements and regulations. Note: Have all persons who may contact this product, aware of the information contained in this M.S.D.S.. Note: The information contained herein relates only to this product or material and may not be valid when used in combination with any other products or materials or in any process. The statements, technical information and recommendations contained herein, is to the best of our knowledge and belief, accurate, complete and reliable as of the date compiled, but they are given without warranty or guarantee of any kind express or implied. We assume no responsibility for any loss, damage or expense, direct or consequential arising out of their use. It is the users' responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use and adopt such safety precautions and procedures as be necessary. Note: If you need any more information from us for making the determinations which you have to make in order to use this product safely, and effectively please contact Supersaul Chemmex Inc. at Fax 780-967-5174

Section 1: IDENTIFICATION

Product Identifier:	Diesel
Other Means of Identification:	#2 Diesel Clear; Diesel Government Use; F76 Navy Distillate; Heating Oil #2; Low Sulfur Diesel-Off Road; Ultra Low Sulfur Diesel-Clear; Ultra Low Sulfur Diesel-Dyed; #2 Fuel Oil, ULSD.
SDS Number:	844
Product Code:	#2 Diesel Clear (311100); Diesel, Govt. Use (312400); Dyed Premium Diesel, Ultra Low (302301); Dyed Ultra Low Diesel w/ CENEX (3023002); F76 Navy Distillate (311400); Heating Oil (312200); Low Sulfur Diesel, Off Road (312300); Ultra Low Premium Diesel, Clear (301101); Ultra Low Sulfur Diesel, Clear (301100); Ultra Low Diesel Clear w/ CENEX (302301); Ultra Low Sulfur Diesel, Dyed (Dock) (3023003); Ultra Low Sulfur Diesel, Dyed (302300).
Product Use:	Fuel.
Restrictions on Use:	Not available.
Manufacturer/Supplier:	U.S. OIL & REFINING CO. 3001 Marshall Ave. Tacoma, WA 98421
Emergency Phone:	U.S. OIL & REFINING CO.: (253) 383-1651 CHEMTREC: 800-424-9300 NATIONAL POISON CENTER: 1-800-222-1222
Date of Preparation of SDS:	February 24, 2015

Section 2: HAZARD(S) IDENTIFICATION

CLASSIFICATION:
Flammable Liquids, Category 3
Skin Irritation, Category 2
Carcinogenicity, Category 2
Specific Target Organ Toxicity (Single Exposure), Category 3 - Narcotic Effects
Aspiration Hazard, Category 1

LABEL ELEMENTS

Hazard Symbol(s):

Signal Word: Danger

Hazard Statements:
Flammable liquid and vapor.
Causes skin irritation.
Suspected of causing cancer.
May cause drowsiness or dizziness.
May be fatal if swallowed and enters airways.

PRECAUTIONARY STATEMENTS

Prevention:
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat, sparks, open flames, and hot surfaces. – No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical, ventilating, and lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing mist, vapors, or spray.
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves, protective clothing and eye protection.

Response:
If swallowed: Immediately call a poison center or doctor.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
If inhaled: Remove person to fresh air and keep comfortable for breathing.
Call a poison center or doctor if you feel unwell.
Do NOT induce vomiting.
If skin irritation occurs: Get medical advice/attention.
Wash contaminated clothing before reuse.
In case of fire: Use dry chemical, CO_2, water spray or regular foam to extinguish.

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

Disposal:
Dispose of contents/container in accordance with applicable regional, national and local laws and regulations.

Hazards Not Otherwise Classified: No applicable information was found.

Ingredients with Unknown Acute Toxicity: 100% of this product mixture consists of ingredient(s) of unknown acute toxicity.

This material is considered hazardous by the OSHA Hazard Communication Standard, (29 CFR 1910.1200).

Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredient(s)	Common name / Synonyms	CAS No.	% wt./wt.
Fuels, Diesel, No. 2	Diesel Fuel No. 2	68476-34-6	0, 99.5 - 100*
Fuels, Diesel	Not available.	68334-30-5	0, 99.5 - 100*
Fuel Oil, No. 2	Fuel Oil No. 2	68476-30-2	0, 99.5 - 100*
Naphthalene	Not available.	91-20-3	0 - 0.1, 0.1 - 0.5*

* Multiple concentration ranges are listed due to production variability, and in conformance with Canadian WHMIS requirements.

Section 4: FIRST-AID MEASURES

Inhalation: If inhaled: Remove person to fresh air and keep comfortable for breathing. If symptoms persist, get medical attention/advice. If breathing or the heart stops, trained personnel should immediately begin artificial respiration (AR) or cardiopulmonary resuscitation (CPR) respectively. Get medical attention immediately.

Acute and delayed symptoms and effects: May cause drowsiness or dizziness. May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain. Excessive inhalation may cause headache, dizziness, confusion, loss of appetite and/or loss of consciousness.

Skin Contact: If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower for at least 15 minutes. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Acute and delayed symptoms and effects: Causes skin irritation. Signs/symptoms may include localized redness, swelling, and itching.

Eye Contact: If in eyes: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If symptoms persist, get medical attention/advice.

Acute and delayed symptoms and effects: May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Ingestion: If swallowed: Do NOT induce vomiting. Immediately call a poison center or doctor. If vomiting occurs naturally, have victim lean forward to reduce the risk of aspiration. Never give anything by mouth to an unconscious person. If breathing or the heart stops, trained personnel should immediately begin artificial respiration (AR) or cardiopulmonary resuscitation (CPR)

respectively. Get medical attention immediately.

Acute and delayed symptoms and effects: May be fatal if swallowed and enters airways. May cause gastrointestinal irritation. Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

Note to Physicians: Symptoms may not appear immediately.

Section 5: FIRE-FIGHTING MEASURES

NFPA 704

SUITABLE/UNSUITABLE EXTINGUISHING MEDIA

Suitable Extinguishing Media: Small Fire: Dry chemical, CO_2, water spray or regular foam.

Large Fire: Water spray, fog or regular foam. Move containers from fire area if it can be done safely.

Unsuitable Extinguishing Media: Do not use straight streams.

SPECIFIC HAZARDS

Flammable liquid and vapor. Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Vapor explosion hazard indoors, outdoors or in sewers. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water.

If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

Fire involving Tanks or Car/Trailer Loads: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Products of Combustion: Oxides of Carbon. Oxides of Sulfur. Oxides of Nitrogen. Aromatic Hydrocarbons.

Sensitivity to Mechanical Impact: This material is not sensitive to mechanical impact.

Sensitivity to Static Discharge: Take precautionary measures against static discharge. This material is sensitive to static discharge.

SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS

Inhalation or contact with material may irritate or burn skin and eyes. Fire may produce irritating, corrosive and/or toxic gases. Vapors may cause dizziness or suffocation. Runoff from fire control or dilution water may cause pollution. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.

Section 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

Personal Precautions: Do not touch or walk through spilled material. Use personal protection recommended in Section 8.

Protective Equipment: Emergency eyewash capability should be available. Wear respiratory protection as conditions warrant.

Emergency Procedures: As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). All equipment used when handling the product must be grounded.

METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP

Methods for Containment: Stop leak if it can be done without risk. A vapor suppressing foam may be used to reduce vapors. Prevent spreading of material into sewers. Avoid allowing water runoff to contact spilled material.

Methods for Clean-Up: Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material. Large spills should be removed with explosion proof vacuum equipment.

Section 7: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING:

Do not swallow. Avoid breathing mist, vapors, or spray. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, sparks, open flames, and hot surfaces. No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area.

CONDITIONS FOR SAFE STORAGE:

Store in a cool, dry, well-ventilated place. Use approved containers that are tightly closed and clearly labeled. Store away from incompatible materials. See Section 10 for information on Incompatible Materials. Protect storage containers from physical damage, sunlight, and all sources of ignition. Post area as “No Smoking”.

Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Component	ACGIH	OSHA
Diesel Fuel No. 2 [CAS No. 68476-34-6]	100 mg/m³ (TWA); Skin; A3; Inhalable fraction and vapor (2007)	No PEL established.
Fuels, Diesel [CAS No. 68334-30-5]	100 mg/m³ (TWA); Skin; A3; Inhalable fraction and vapor (2007)	No PEL established.
Fuel Oil No. 2 [CAS No. 68476-30-2]	100 mg/m³ (TWA); Skin; A3; Inhalable fraction and vapor (2007)	No PEL established.
Naphthalene [CAS No. 91-20-3]	10 ppm (TWA); Skin; A3 (2013)	10 ppm (TWA), 50 mg/m³ (TWA); 15 ppm (STEL) [Vacated]

PEL: Permissible Exposure Limit
TWA: Time-Weighted Average
STEL: Short-Term Exposure Limit

ENGINEERING CONTROLS

Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, gas, etc.) below recommended exposure limits. Use explosion-proof electrical, ventilating, and lighting equipment.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Eye/Face Protection:

Wear safety glasses. Use equipment for eye protection that meets the standards referenced by CSA Standard CAN/CSA-Z94.3-92 and OSHA regulations in 29 CFR 1910.133 for Personal Protective Equipment.

Hand Protection:

Wear protective gloves. Consult manufacturer specifications for further information.

Skin and Body Protection:

Wear protective clothing. Flame resistant clothing that meets the NFPA 2112 and CAN/CGSB 155.20 standards is recommended in areas where material is stored or handled.

Respiratory Protection:

If engineering controls and ventilation are not sufficient to control exposure to below the allowable limits then an appropriate NIOSH approved air-purifying respirator, with organic vapor cartridge, or self-contained breathing apparatus must be used. Supplied air breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators.

General Hygiene Considerations:

Handle according to established industrial hygiene and safety practices. Consult a competent industrial hygienist to

determine hazard potential and/or the PPE manufacturers to ensure adequate protection. Emergency eyewash should be available near operations presenting a potential splash exposure. Avoid skin exposure. Promptly remove contaminated clothing, gloves, and shoes.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Transparent liquid.
Color:	Varies, clear, yellow (pale to straw), greenish-yellow, red, green color.
Odor:	Faint petroleum odor.
Odor Threshold:	Not available.
Physical State:	Liquid.
pH:	Not available.
Melting Point / Freezing Point:	Not available.
Initial Boiling Point:	150 °C (300 °F)
Boiling Range:	150 to 360 °C (300 to 680 °F)
Flash Point:	> 52 °C (126 °F)
Evaporation Rate:	Not available.
Flammability (solid, gas):	Not applicable.
Lower Flammability Limit:	Approximately 0.7 %
Upper Flammability Limit:	Approximately 5.0 %
Vapor Pressure:	Not available.
Vapor Density:	> 1 (Air = 1)
Relative Density:	0.84 to 0.88 (Water = 1) at 16 °C (60 °F)
Solubilities:	Insoluble in water.
Partition Coefficient: n-Octanol/Water:	Not available.
Auto-ignition Temperature:	257 °C (495 °F)
Decomposition Temperature:	Not available.
Viscosity:	3 cSt at 40 °C (104 °F)
Percent Volatile, wt. %:	Not available.
VOC Content, wt. %:	Not available.

Section 10: STABILITY AND REACTIVITY

Reactivity: Contact with incompatible materials. Sources of ignition. Exposure to heat.

Chemical Stability: Stable under normal storage conditions.

Possibility of Hazardous Reactions: None known.

Conditions to Avoid: Contact with incompatible materials. Sources of ignition. Exposure to heat.

Incompatible Materials: Strong acids. Strong oxidizers.

Hazardous Decomposition Products: None known.

Section 11: TOXICOLOGICAL INFORMATION

LIKELY ROUTES OF EXPOSURE: Eye contact. Skin contact. Inhalation. Ingestion. Skin absorption.

ACUTE EXPOSURE

PRODUCT TOXICITY

Oral: Not available.

Dermal: Not available.

Inhalation: Not available.

COMPONENT TOXICITY

Component	CAS No.	LD_{50} oral	LD_{50} dermal	LC_{50}
Diesel Fuel No. 2	68476-34-6	Not available.	Not available.	Not available.
Fuels, Diesel	68334-30-5	7500 mg/kg (rat)	> 5000 µL/kg (rabbit)	Not available.
Fuel Oil No. 2	68476-30-2	12000 mg/kg (rat)	4720 µL/kg (rabbit)	Not available.
Naphthalene	91-20-3	490 mg/kg (rat)	> 2500 mg/kg (rat)	> 340 mg/m³ (rat); 1H

Target Organs: Skin. Eyes. Gastrointestinal tract. Respiratory system. Blood. Liver. Kidneys. Central nervous system.

SYMPTOMS (including delayed and immediate effects)

Inhalation: May cause drowsiness or dizziness. May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain. Excessive inhalation may cause headache, dizziness, confusion, loss of appetite and/or loss of consciousness. Hemolytic anemia (destruction of red blood cells) is the primary health concern for humans exposed to Naphthalene for either short or long periods of time. Other effects may include nausea, profuse perspiration, vomiting, kidney damage and liver damage. Optic neuritis (inflammation of the optic nerve) has

been observed. Cataracts have also occurred.

Eye: May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Skin: Causes skin irritation. Signs/symptoms may include localized redness, swelling, and itching. Naphthalene may be absorbed through the skin in harmful amounts.

Ingestion: May be fatal if swallowed and enters airways. May cause gastrointestinal irritation. Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea. Naphthalene may cause liver and kidney damage. May cause blood abnormalities, methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. Ingestion of large quantities of Naphthalene may cause severe hemolytic anemia and hemoglobinuria.

Skin Sensitization: Not available.

Respiratory Sensitization: Not available.

Medical Conditions Aggravated By Exposure: Exposure to Naphthalene may aggravate Glucose-6-Phosphate Dehydrogenase deficiency.

CHRONIC EFFECTS (from short and long-term exposure)

Target Organs: Skin. Eyes. Gastrointestinal tract. Respiratory system. Central nervous system. Cardiovascular system. Blood. Liver. Kidneys. Central nervous system. Thymus.

Chronic Effects: Prolonged or repeated contact may dry skin and cause irritation. High vapor concentrations, generally greater than 10% by volume, may sensitize the heart and lead to lethal cardiac arrhythmias. Diesel fuel may cause damage to the blood, thymus and liver through prolonged or repeated exposure.

Carcinogenicity: May cause cancer. Lifetime skin painting studies in animals with petroleum distillates have produced tumors in animals following prolonged and repeated skin contact.

Component Carcinogenicity

Component	ACGIH	IARC	NTP	OSHA	Prop 65
Diesel Fuel No. 2	A3	Not listed.	Not listed.	Not listed.	Not listed.
Fuels, Diesel	A3	Not listed.	Not listed.	Not listed.	Not listed.
Fuel Oil No. 2	A3	Not listed.	Not listed.	Not listed.	Not listed.
Naphthalene	A3	Group 2B	List 2	OSHA Carcinogen.	Listed.

Mutagenicity: Not available.

Reproductive Effects: Not available.

Developmental Effects

Teratogenicity: Not available.

Embryotoxicity: Not available.

Toxicologically Synergistic Materials: Not available.

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity: This product is potentially toxic to aquatic organisms and should be kept out of sewage and drainage systems and all bodies of water.

Persistence / Degradability: Not available.

Bioaccumulation / Accumulation: Not available.

Mobility in Environment: Not available.

Other Adverse Effects: Not available.

Section 13: DISPOSAL CONSIDERATIONS

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

Section 14: TRANSPORT INFORMATION

REGULATORY INFORMATION	ID NUMBER	EMERGENCY RESPONSE GUIDEBOOK	PROPER SHIPPING NAME	CLASS	PACKING GROUP	PLACARD
DOT Classification	NA1993	Guide 128	FUEL OIL	3	III	
TDG Classification	UN1202	Guide 128	DIESEL FUEL	3	III	
IATA/ICAO	UN1202	Guide 128	DIESEL FUEL	3	III	

Section 15: REGULATORY INFORMATION

CHEMICAL INVENTORIES

US (TSCA)
The components of this product are in compliance with the chemical notification requirements of TSCA.

Canada (DSL)
The components of this product are in compliance with the chemical notification requirements of the NSN Regulations under CEPA, 1999.

FEDERAL REGULATIONS

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

WHMIS Classification: Class B3 - Combustible Liquids.
Class D2A - Carcinogenicity.
Class D2B - Skin irritant.

Hazard Symbols:

United States
This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SARA Title III

Component	Section 302 (EHS) TPQ (lbs.)	Section 304 EHS RQ (lbs.)	CERCLA RQ (lbs.)	Section 313	RCRA CODE	CAA 112(r) TQ (lbs.)
Naphthalene	Not listed.	Not listed.	100	313	U165	Not listed.

SARA SECTION 311/312 - EPA HAZARD CATEGORIES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	–	–

State Regulations
California
California Prop 65: WARNING: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Component	Type of Toxicity
Naphthalene	cancer

Section 16: OTHER INFORMATION

Disclaimer:
The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for his own particular use.

Date of Preparation of SDS:	February 24, 2015
SDS Expiry Date (Canada):	February 23, 2018
Version:	1.3
GHS SDS Prepared by:	**Deerfoot Consulting Inc.**
	Phone: (403) 720-3700

MATERIAL SAFETY DATA SHEET

603 N Monitor Road
Springdale, AR 72764
PH: (479) 756-5874

PRODUCT NAME: EC+ PLUS Wash-Water Flocculant
MSDS NO: 9-10023.06

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE CALL: CHEMTREC 1-800-424-9300 OUTSIDE US CALL 1-703-527-3887	FOR MEDICAL EMERGENCY CALL ROCKY MOUNTAIN POISON CENTER: 1-303-623-5716	HEALTH HAZARD: (0 None > 4 Extreme) Health =1 Flammability =1 Reactivity =0

SECTION 1 – PRODUCT IDENTIFICATION

DATE PREPARED: December 16, 2009 SUPERSEDES: September 18, 2006

PREPARED BY: EHS Manager

D.O.T. SHIPPING CLASS: Product is not regulated during land, air or marine transportation.

SECTION 2 – HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENTS	CAS. NO.	OSHA PEL	ACGIH TLV	ORAL LD50 RAT	Per-Cent

Contains no hazardous components as per 29 CFR 1910.1200

SECTION 3 – PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: > N/A SOLUBILITY IN WATER: Emulsifiable SPECIFIC GRAVITY: 1.03–1.07

VAPOR PRESSURE mm/hg: 23 @ 70 °F: N/E VAPOR DENSITY (Air=1): N/E

REACTIVITY IN WATER: No pH 5% SOLUTION = 7- 8

FREEZING POINT: -4 °F APPEARANCE AND ODOR: Opaque off-white liquid, slight hydrocarbon odor.

SECTION 4 – FIRE & EXPLOSION DATA

FLASH POINT: > 212 °F FLAMMABILITY LIMITS IN AIR % BY VOLUME:

METHOD USED: ASTM D-93 LEL LOWER: None UEL UPPER: None

AUTO-IGNITION TEMPERATURE: None

EXTINGUISHER MEDIA: Dry Chemical, Carbon Dioxide, extinguishing agents suitable for class B fires. Do not use water unless flooding amounts are available.

SPECIAL FIRE FIGHTING PROCEDURES: Water in contact with product will cause slippery floors. Wear a full face positive-pressure breathing apparatus and protective suit.

UNUSUAL FIRE & EXPLOSION HAZARDS: None

SECTION 5 – PHYSICAL HAZARDS (REACTIVITY DATA)

STABILITY: Stable under normal conditions.

INCOMPATIBILITY (MATERIALS TO AVOID): Avoid strong oxidizing agents (chlorine, hydrogen peroxide, etc.)

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of carbon and nitrogen under fire.

HAZARDOUS POLYMERIZATION: Will NOT occur

CONDITIONS TO AVOID: Addition of water results in gelling. Avoid freezing conditions. Water in contact with product will cause slippery floors.

SECTION 6 – HEALTH HAZARDS

ACUTE: May cause eye and skin irritation with prolonged contact.

CHRONIC: Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

SIGNS & SYMPTOMS OF EXPOSURE: Eye irritation – Skin irritation

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None

CARCINOGEN OR POTENTIAL CARCINOGENS: OSHA: None NTP: None IARC: None ACGIH: None

EMERGENCY FIRST AID:

EYES: Immediately flush with water for 15 minutes while holding eyelids open. Get medical attention.

SKIN: Remove contaminated clothing and wash affected area thoroughly with water. Get medical attention if irritation develops.

INHALATION: Remove to fresh air, treat symptomatically.

INGESTION: Do not induce vomiting without medical advice. Wash out mouth and drink water. Seek medical attention if symptoms develop.

ROUTES OF ENTRY:

INHALATION: Not likely a route of exposure. If swallowed a jelly mass may form which in digestion may cause blockage.

EYES: May cause eye irritation

SKIN: May cause skin irritation

INGESTION: Not likely a route of exposure. If swallowed a jelly mass may form which in digestion may cause blockage.

SECTION 7 – SPECIAL PRECAUTIONS & SPILL / LEAK PROCEDURES

HANDLING & STORAGE:	Store in a cool dry area. DO NOT FREEZE. Keep closed when not in use. Store separately from oxidizers.
OTHER PRECAUTIONS:	Normal good housekeeping practices.
IN CASE OF SPILL:	Shut off leak, if this can be done without injury. Do Not Use water, water in contact with product will cause slippery floors. Soak up small spills with absorbent material. Place residues in a suitable, covered, properly labels container. Contain large spills using absorbent material or diking and place in recovery or salvage drums or pump to a salvage tank for proper disposal.
WASTE DISPOSAL:	Dispose of in accordance with all Federal, State and Local pollution control regulations. Do not discharge directly into lakes, ponds, streams, waterways or public water supplies. Not considered a hazardous waste as defined by RCRA 40 CFR 261.

SECTION 8 – SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:	Not normally needed.
VENTILATION:	Use with adequate ventilation.
PROTECTIVE GLOVES:	Nitrile gloves or PVC gloves
EYE PROTECTION:	Safety / Splash Glasses or Goggles
OTHER:	Wear standard protective clothing.
HYGIENIC PRACTICES:	Wash thoroughly after handling. Do not get in eyes, on skin or on clothing.

SECTION 9 – COMMUNITY RIGHT TO KNOW LIST

	CHEMICAL NAME:	C.A.S. NO.
1.	Anionic Acrylamide Copolymer	N/A

NA = Not Applicable NE = None Established

The information provided in this Material Safety Data Sheet has been compiled from our experience and data presented in various technical publications. It is the users responsibility to determine the suitability of this information for the adoption of safety precautions as may be necessary. We reserve the right to revise Material Safety Data Sheets from time to time as new technical information becomes available. The information herein is furnished without warranty of any kind.

SAFETY DATA SHEET

1. Identification

Product identifier	**GASOLINE**
Other means of identification	
Product code	2738
Synonyms	Ethanol Blended Gasoline * Non-Ethanol Blended Gasoline * Unleaded Gasoline * Gasoline * Regular Gasoline * Premium Gasoline * Premium Unleaded Gasoline * Mid Grade Gasoline * Gasoline (Export) * Petroleum Naphtha
Recommended use	Motor fuels.
Recommended restrictions	None known.
Manufacturer/Importer/Supplier/Distributor information	
Manufacturer	Consumers' Co-operative Refineries Limited
Address	P.O. Box 260; 9th Avenue North Regina, SK S4P 3A1 Canada
Telephone	(306) 721-5353 -or- (306) 719-4353
Supplier	Federated Co-operatives Limited
Address	P.O. Box 1050, 401 - 22nd Street East Saskatoon SK S7K 3M9 Canada
Telephone	(306) 244-3447
24 Hour Emergency Telephone	(613) 996-6666 - Canutec

2. Hazard(s) identification

Physical hazards	Flammable liquids	Category 2
Health hazards	Skin corrosion/irritation	Category 2
	Germ cell mutagenicity	Category 1B
	Carcinogenicity	Category 1B
	Specific target organ toxicity, single exposure	Category 3 narcotic effects
	Specific target organ toxicity, repeated exposure	Category 1 (hematopoietic system)
	Aspiration hazard	Category 1
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 2
	Hazardous to the aquatic environment, long-term hazard	Category 2

Label elements

Signal word	Danger
Hazard statement	Highly flammable liquid and vapor. Causes skin irritation. May cause genetic defects. May cause cancer. May cause drowsiness or dizziness. Causes damage to organs (hematopoietic system) through prolonged or repeated exposure. May be fatal if swallowed and enters airways. Toxic to aquatic life with long lasting effects.

Precautionary statement

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 mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.
Response	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse. 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. In case of fire: Use alcohol resistant foam, water fog, carbon dioxide, dry chemical powder for extinction. Collect spillage.
Storage	Store in a well-ventilated place. Keep container tightly closed. Keep cool. Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite liquid and vapor. May cause flash fire or explosion.

Supplemental information None.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Gasoline	86290-81-5	60-100
Ethanol	64-17-5	0-10
Benzene	71-43-2	<1.5

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

4. First-aid measures

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

Skin contact In case of contact, flush skin with plenty of water for at least 20 minutes, while removing contaminated shoes and clothes. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye contact Immediately flush eyes with plenty of water for at least 20 minutes. Remove contact lenses, if present and easy to do. Get medical attention if irritation develops and persists.

Ingestion Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Most important symptoms/effects, acute and delayed Skin irritation. May cause redness and pain. Direct contact with eyes may cause temporary irritation. May cause drowsiness and dizziness. Headache. Nausea, vomiting. Causes damage to organs (hematopoietic system) through prolonged or repeated exposure. Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia. Prolonged exposure may cause chronic effects.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

General information Take off all contaminated clothing immediately. IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media Alcohol resistant foam. Water fog. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical	Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. This product is a poor conductor of electricity and can become electrostatically charged. If sufficient charge is accumulated, ignition of flammable mixtures can occur. To reduce potential for static discharge, use proper bonding and grounding procedures. This liquid may accumulate static electricity when filling properly grounded containers. Static electricity accumulation may be significantly increased by the presence of small quantities of water or other contaminants. Material will float and may ignite on surface of water. During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Highly flammable liquid and vapor.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Use appropriate containment to avoid environmental contamination. Transfer by mechanical means such as vacuum truck to a salvage tank or other suitable container for recovery or safe disposal. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Take precautionary measures against static discharge. Use only non-sparking tools. Keep combustibles (wood, paper, oil, etc.) away from spilled material. Prevent entry into waterways, sewer, basements or confined areas. Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. Inform appropriate managerial or supervisory personnel of all environmental releases. Use appropriate containment to avoid environmental contamination.

7. Handling and storage

Precautions for safe handling	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Explosion-proof general and local exhaust ventilation. Minimize fire risks from flammable and combustible materials (including combustible dust and static accumulating liquids) or dangerous reactions with incompatible materials. Handling operations that can promote accumulation of static charges include but are not limited to: mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Do not breathe mist or vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. When using, do not eat, drink or smoke. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices. For additional information on equipment bonding and grounding, refer to the Canadian Electrical Code in Canada, (CSA C22.1), or the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" or National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity" or National Fire Protection Association (NFPA) 70, "National Electrical Code".

Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Eliminate sources of ignition. Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	2.5 ppm
	TWA	0.5 ppm
Ethanol (CAS 64-17-5)	STEL	1000 ppm
Gasoline (CAS 86290-81-5)	STEL	500 ppm
	TWA	300 ppm

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	8 mg/m3
		2.5 ppm
	TWA	1.6 mg/m3
		0.5 ppm
Ethanol (CAS 64-17-5)	TWA	1880 mg/m3
		1000 ppm
Gasoline (CAS 86290-81-5)	STEL	500 ppm
	TWA	300 ppm

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	2.5 ppm
	TWA	0.5 ppm
Ethanol (CAS 64-17-5)	STEL	1000 ppm
Gasoline (CAS 86290-81-5)	STEL	500 ppm
	TWA	300 ppm

Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	2.5 ppm
	TWA	0.5 ppm
Ethanol (CAS 64-17-5)	STEL	1000 ppm
Gasoline (CAS 86290-81-5)	STEL	500 ppm
	TWA	300 ppm

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	2.5 ppm
	TWA	0.5 ppm
Ethanol (CAS 64-17-5)	STEL	1000 ppm
Gasoline (CAS 86290-81-5)	STEL	500 ppm
	TWA	300 ppm

Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	15.5 mg/m3
		5 ppm
	TWA	3 mg/m3
		1 ppm

Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value
Ethanol (CAS 64-17-5)	TWA	1880 mg/m3 1000 ppm

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
Benzene (CAS 71-43-2)	25 µg/g	S-Phenylmercapturic acid	Creatinine in urine	*

* - For sampling details, please see the source document.

Exposure guidelines

Canada - Alberta OELs: Skin designation

Benzene (CAS 71-43-2) Can be absorbed through the skin.

Canada - British Columbia OELs: Skin designation

Benzene (CAS 71-43-2) Can be absorbed through the skin.

Canada - Manitoba OELs: Skin designation

Benzene (CAS 71-43-2) Can be absorbed through the skin.

Canada - Ontario OELs: Skin designation

Benzene (CAS 71-43-2) Can be absorbed through the skin.

US ACGIH Threshold Limit Values: Skin designation

Benzene (CAS 71-43-2) Can be absorbed through the skin.

Appropriate engineering controls Explosion-proof general and local exhaust ventilation. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles). Wear face shield if there is risk of splashes.

Skin protection

Hand protection Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

Other Wear appropriate chemical resistant clothing. Full body suit and boots are recommended when handling large volumes or in emergency situations. Flame retardant protective clothing is recommended where the potential of flash fire exists.

Respiratory protection In case of inadequate ventilation or risk of inhalation of vapors, use suitable respiratory equipment. Wear a NIOSH-approved (or equivalent) full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations When using do not smoke. 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.

9. Physical and chemical properties

Appearance Amber liquid.

Physical state Liquid.

Form Liquid.

Color Amber.

Odor Gasoline-like.

Odor threshold < 0.25 ppm

pH Not available.

Melting point/freezing point Not available.

Initial boiling point and boiling range > 95 °F (> 35 °C)

Flash point < -40.0 °F (< -40.0 °C) Closed Cup

Evaporation rate 4 (Butyl acetate = 1)

Flammability (solid, gas)	Flammable gas. Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	1.2 %
Flammability limit - upper (%)	7.1 %
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	> 1 (Air=1)
Vapor density	3 - 4 (Air=1)
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Insoluble in water.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	842 °F (450 °C)
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Specific gravity	0.69 - 0.75
VOC (Weight %)	100 %

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials. Do not pressurize, cut, weld, braze, solder, drill, grind or expose empty containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Thermal decomposition of this product can generate carbon monoxide and carbon dioxide. Sulfur oxides. Hydrocarbons.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause damage to organs through prolonged or repeated exposure by inhalation. May cause drowsiness and dizziness. Headache. Nausea, vomiting.
Skin contact	Causes skin irritation. Benzene can be absorbed through skin.
Eye contact	Direct contact with eyes may cause temporary irritation.
Ingestion	Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia.
Symptoms related to the physical, chemical and toxicological characteristics	Skin irritation. May cause redness and pain. Direct contact with eyes may cause temporary irritation. May cause drowsiness and dizziness. Headache. Nausea, vomiting. Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia. Causes damage to organs (hematopoietic system) through prolonged or repeated exposure. Prolonged exposure may cause chronic effects.

Information on toxicological effects

Acute toxicity	Not expected to be acutely toxic.

Components	Species	Test Results
Ethanol (CAS 64-17-5)		
Acute		
Inhalation		
LC50	Rat	20000 ppm, 10 Hours
Oral		
LD50	Rat	6.2 g/kg

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/eye irritation Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

Respiratory sensitization Not a respiratory sensitizer.

Skin sensitization This product is not expected to cause skin sensitization.

Germ cell mutagenicity May cause genetic defects.

Carcinogenicity May cause cancer.

ACGIH Carcinogens

Benzene (CAS 71-43-2)	A1 Confirmed human carcinogen.
Gasoline (CAS 86290-81-5)	A3 Confirmed animal carcinogen with unknown relevance to humans.

Canada - Alberta OELs: Carcinogen category

Benzene (CAS 71-43-2)	Confirmed human carcinogen.

Canada - Manitoba OELs: carcinogenicity

BENZENE (CAS 71-43-2)	Confirmed human carcinogen.
ETHANOL (CAS 64-17-5)	Confirmed animal carcinogen with unknown relevance to humans.
GASOLINE (CAS 86290-81-5)	Confirmed animal carcinogen with unknown relevance to humans.

Canada - Quebec OELs: Carcinogen category

Benzene (CAS 71-43-2)	Detected carcinogenic effect in humans.

IARC Monographs. Overall Evaluation of Carcinogenicity

Benzene (CAS 71-43-2)	1 Carcinogenic to humans.
Gasoline (CAS 86290-81-5)	2B Possibly carcinogenic to humans.

Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure May cause drowsiness and dizziness.

Specific target organ toxicity - repeated exposure Causes damage to organs (hematopoietic system) through prolonged or repeated exposure.

Aspiration hazard May be fatal if swallowed and enters airways.

Chronic effects Causes damage to organs through prolonged or repeated exposure. Prolonged exposure may cause chronic effects.

12. Ecological information

Ecotoxicity Toxic to aquatic life with long lasting effects.

Components		Species	Test Results
Ethanol (CAS 64-17-5)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia obtusa)	10100 - 11200 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	13480 mg/l, 96 hours

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential

Partition coefficient n-octanol / water (log Kow)

Benzene (CAS 71-43-2)	2.13
Ethanol (CAS 64-17-5)	-0.31

Mobility in soil The product is insoluble in water.

Other adverse effects The product contains a substance which has a photochemical ozone creation potential.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	D001: Waste Flammable material with a flash point <140 F D018: Waste Benzene The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

TDG

UN number	UN1203
UN proper shipping name	PETROL
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	II
Environmental hazards	Yes
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IATA

UN number	UN1203
UN proper shipping name	Gasoline
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Label(s)	3
Packing group	II
Environmental hazards	Yes
ERG Code	3H
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number	UN1203
UN proper shipping name	Gasoline
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Label(s)	3
Packing group	II
Environmental hazards	
Marine pollutant	Yes
EmS	F-E, S-E
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

15. Regulatory information

Canadian regulations

Controlled Drugs and Substances Act

Not regulated.

Export Control List (CEPA 1999, Schedule 3)

Not listed.

Greenhouse Gases

Not listed.

Precursor Control Regulations

Not regulated.

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Kyoto protocol

Not applicable.

Montreal Protocol

Not applicable.

Basel Convention

Not applicable.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other Information

Issue date	25-August-2015
Revision date	25-August-2015
Version #	02
Further information	The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available.
Disclaimer	To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Material Safety Data Sheet

Glycol

Section 1. Product and Company Identification

Product name : Glycol
Product code : B28454
Synonym : Glycerine; Glycerol
Material uses : Other non-specified industry: Analytical reagent.
Manufacturer : EMD Chemicals Inc.
P.O. Box 70
480 Democrat Road
Gibbstown, NJ 08027
856-423-6300 Technical Service
Monday - Friday: 8:00 - 5:00 PM
Validation date : **4/3/2006.**
Print date :
In case of emergency : 800-424-9300 CHEMTREC (USA)
613-996-6666 CANUTEC (Canada)
24 Hours/Day: 7 Days/Week

Section 2. Hazards Identification

Physical state : Liquid. (Viscous liquid.)
Odor : Odorless.
OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview : WARNING!
CAUSES DAMAGE TO THE FOLLOWING ORGANS: KIDNEYS, RESPIRATORY TRACT, SKIN, EYES, EYE, LENS OR CORNEA.
MAY CAUSE EYE AND SKIN IRRITATION.
Avoid contact with skin and clothing. Wash thoroughly after handling.
Routes of entry : Inhalation. Ingestion.
Potential acute health effects
Eyes : Moderately irritating to eyes.
Skin : Moderately irritating to the skin.
Inhalation : No known significant effects or critical hazards.
Ingestion : Practically non-toxic if swallowed.
Carcinogenic effects : No known significant effects or critical hazards.
Mutagenic effects : No known significant effects or critical hazards.
Teratogenicity / Reproductive toxicity : No known significant effects or critical hazards.
Medical conditions aggravated by over-exposure : Repeated skin exposure can produce local skin destruction or dermatitis. Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to the substance can produce target organs damage.

See toxicological information (section 11)

Section 3. Composition/Information on Ingredients

United States

Name	CAS number	% by Weight
Glycerin	56-81-5	100

Section 4. First Aid Measures

Eye contact : Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention.
Skin contact : Flush contaminated skin with plenty of water. Continue to rinse for at least 10 minutes. Get medical attention. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Inhalation : Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if symptoms occur. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Ingestion : Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the

exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if symptoms occur. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

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

Section 5. Fire Fighting Measures

Flammability of the product : No specific hazard.

Products of combustion : These products are carbon oxides (CO, CO_2).

Extinguishing media

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

Not suitable : None known.

Special exposure hazards : Not available.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental Release Measures

Personal precautions : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment.

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up : If emergency personnel are unavailable, contain spilled material. For small spills, add absorbent (soil may be used in the absence of other suitable materials), scoop up material and place in a sealable, liquid-proof container for disposal. For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal.

Section 7. Handling and Storage

Handling : Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Storage : Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Product name	Exposure limits
United States	
Glycerin	**ACGIH TLV (United States, 1/2005). Notes: Inhalable fraction. See Appendix C, paragraph A. Inhalable Particulate Mass TLVs (IPM-TLVs) for those materials that are hazardous when deposited anywhere in the respiratory tract.** TWA: 10 mg/m^3 8 hour/hours. Form: Mist **OSHA PEL (United States, 8/1997).** TWA: 5 mg/m^3 8 hour/hours. Form: Respirable fraction TWA: 15 mg/m^3 8 hour/hours. Form: Total dust **OSHA PEL 1989 (United States, 3/1989).** TWA: 5 mg/m^3 8 hour/hours. Form: Respirable fraction TWA: 10 mg/m^3 8 hour/hours. Form: Total dust

Consult local authorities for acceptable exposure limits.

Engineering measures : No special ventilation requirements. Good general ventilation should be sufficient to control airborne levels. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Personal protection

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.
Recommended: splash goggles

Skin : 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.
Body: Recommended: lab coat

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. 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.

Hands : 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. Recommended: neoprene

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.

Section 9. Physical and Chemical Properties

Physical state	:	Liquid. (Viscous liquid.)
Flash point	:	Closed cup: 159.85 C (319.7 F).
Auto-ignition temperature	:	369.85 C (697.7 F)
Color	:	Colorless.
Odor	:	Odorless.
Molecular weight	:	92.11 g/mole
Molecular formula	:	C3-H8-O3
Boiling/condensation point	:	290 C (554 F)
Melting/freezing point	:	19.85 C (67.7 F)
Relative density	:	1.261 (Water = 1)
Vapor density	:	3.1 (Air = 1)

Section 10. Stability and Reactivity

Stability and reactivity	:	The product is stable.
Incompatibility with various substances	:	Reactive or incompatible with the following materials: oxidizing materials.
Hazardous polymerization	:	Will not occur.
Conditions of reactivity	:	Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge, heat and oxidizing materials. Explosive in the presence of the following materials or conditions: oxidizing materials.

Section 11. Toxicological Information

Toxicity data
United States

Product/ingredient name	Test	Result	Route	Species
Glycerin	LD50	12600 mg/kg	Oral	Rat
	LD50	4090 mg/kg	Oral	Mouse
	LD50	7750 mg/kg	Oral	Guinea pig

Chronic effects on humans	:	Causes damage to the following organs: kidneys, upper respiratory tract, skin, eyes, eye, lens or cornea.
Other toxic effects on humans	:	Hazardous in case of skin contact (irritant), of eye contact (irritant).
Specific effects		
Carcinogenic effects	:	No known significant effects or critical hazards.
Mutagenic effects	:	No known significant effects or critical hazards.
Teratogenicity / Reproductive toxicity	:	No known significant effects or critical hazards.
Sensitization		
Ingestion	:	No known significant effects or critical hazards.
Inhalation	:	No known significant effects or critical hazards.
Eyes	:	Moderately irritating to eyes.
Skin	:	Moderately irritating to the skin.

Section 12. Ecological Information

Ecotoxicity data
United States

Product/ingredient name	Species	Period	Result
Glycerin	Oncorhynchus mykiss (LC50)	96 hour/hours	54000 mg/l

Environmental precautions	:	No known significant effects or critical hazards.
Products of degradation	:	These products are carbon oxides (CO, CO_2) and water.
Toxicity of the products of biodegradation	:	The product itself and its products of degradation are not toxic.

Section 13. Disposal Considerations

Waste disposal	:	The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. 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.

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

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Section 14. Transport Information

Regulatory information	UN number	Proper shipping name	Class	PG*	Label	Additional information
DOT Classification	-	CHEMICALS, N.O.S.	-	-		Not available.

PG* : Packing group

Section 15. Regulatory Information

United States

HCS Classification : Irritating material
Target organ effects

U.S. Federal regulations : TSCA 8(b) inventory: Listed
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Glycerin
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Glycerin: Immediate (acute) health hazard, Delayed (chronic) health hazard
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.
Clean Air Act (CAA) 112 accidental release prevention: No products were found.
Clean Air Act (CAA) 112 regulated flammable substances: No products were found.
Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

State regulations : Pennsylvania RTK: Glycerin: (generic environmental hazard)
Massachusetts RTK: Glycerin

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

CEPA DSL/CEPA NDSL : CEPA DSL: Glycerin

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

EU regulations

Risk phrases : This product is not classified according to EU legislation.

International regulations

International lists : Australia (NICNAS): Glycerin

China: Glycerin

Germany water class: Glycerin

Japan (METI): Glycerin

Korea (TCCL): Glycerin

Philippines (RA6969): Glycerin

Section 16. Other Information

Label requirements : WARNING!
CAUSES DAMAGE TO THE FOLLOWING ORGANS: KIDNEYS, RESPIRATORY TRACT, SKIN, EYES, EYE, LENS OR CORNEA.
MAY CAUSE EYE AND SKIN IRRITATION.

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

	1	**Flammability**
Health	1	0 **Instability**
		Special

Notice to reader

The statements contained herein are based upon technical data that EMD Chemicals Inc. believes to be reliable, are offered for information purposes only and as a guide to the appropriate precautionary and emergency handling of the material by a properly trained person having the necessary technical skills. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use, storage and disposal of these materials and the safety and health of employees and customers and the protection of the environment. EMD CHEMICALS INC. MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, WITH RESPECT TO THE INFORMATION HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS.

Safety Data Sheet

Hydrated Lime

Revision date:
May 1, 2015

1. Identification

Product Name: Hydrated Lime

Synonyms: Industrial Hydrate

Recommended Uses: Water treatment, steel flux, caustic agent, pH adjustment, acid gas absorption, construction

Manufacturer: Carmeuse Lime & Stone

US Office
11 Stanwix Street, 21st Floor
Pittsburgh, PA 15222
Phone: (412) 995-5500
Fax: (412) 995-5594

Canadian Office
PO Box 190
Ingersoll, ON N5C 3K5
Phone: (519) 423-6283
Fax: (519) 423-6545

Emergency Contact: Infotrac: (800) 535-5053 (24 hrs a day, 7 days a week)

2. Hazards Identification

GHS classification

Physical Hazards

None

Health Hazards

Skin Irritation	Category 2
Eye Damage	Category 1
Carcinogenicity	Category 1A
Specific Target Organ Toxicity – Single Exposure	Category 3

GHS Label Elements:

Signal Word: Danger

Hazard Statements:
Causes skin irritation.
Causes serious eye damage.
May cause respiratory irritation.
May cause cancer through inhalation

Precautionary Statements:
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep container tightly closed
Do not breathe dust.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in well-ventilated area
Wear protective gloves, clothing and eye protection

Pictograms:

3. Composition

Chemical name	% by weight	CAS#
Calcium hydroxide	> 85	1305-62-0
Silica-crystalline quartz	< 1	14808-60-7

4. First Aid Measures

Eyes: Immediately flush eyes with generous amounts of water for at least 15 minutes. Pull back the eyelid to ensure that all lime dust has been washed out. Seek medical attention immediately. Do not rub eyes.

Skin: Wash exposed area with large amounts of water. Seek medical attention immediately.

Ingestion: Do not induce vomiting. Seek medical attention immediately. Never give anything by mouth unless instructed to do so by medical personnel.

Inhalation: Move victim to fresh air. Seek medical attention if necessary. If breathing has stopped, give artificial respiration

Most Important Symptoms: Irritation of skin, eyes, gastrointestinal tract or respiratory tract.

Immediate medical attention / special treatment? See first aid information above. Note to Physicians: Provide general supportive measures and treat symptomatically.

5. Fire Fighting Measures

Suitable (and unsuitable) fire extinguishing media: Use dry chemical fire extinguisher. Do not use water or halogenated compounds, except that large amounts of water may be used to deluge small quantities of this product.

Specific hazards arising from the product Inhalation, skin or eye contact, can result in serious injury. This product is not combustible or flammable. This product is not considered to be an explosion hazard, although reaction with water or other incompatible materials may rupture containers. When this product is wet, it can be very slippery and can result in a slip hazard. Hazardous Combustion Products: None.

Special protective equipment and precautions for fire fighters Wear full fire-fighting turn-out gear (full Bunker gear), and respiratory protection (SCBA) to prevent inhalation, skin or eye contact.

6. Accidental Release Measures

Personal precautions, protective equipment, emergency procedures:

Avoid inhalation, eye and skin contact. Avoid generating airborne dust. Wear appropriate protective clothing as described in section 8.

Methods and materials for containment and clean up:

Utilize cleanup methods that minimize generating dust: vacuum. Avoid dry sweeping. Residue on surfaces may be removed with copious amount of water or vinegar.

7. Handling & Storage

Safe Handling: Avoid inhalation, skin and eye contact. Avoid generating airborne dust. An eye wash station should be readily available when this product is handled.

Safe Storage: Keep in tightly closed containers. Protect containers from physical damage. Store in a cool, dry, and well-ventilated location. Do not store near incompatible materials (see Section 10 below). Keep away from moisture. Long-term storage in aluminum containers is not recommended, as calcium oxide may corrode aluminum over long periods of time

8. Exposure Controls/Personal Protection

Occupational Exposure Limits

	OSHA PEL (mg/m^3)	ACGIH TLV (mg/m^3)	Ont. Reg. 833 TWAEV (mg/m^3)
Calcium hydroxide	15 (total) 5 (respirable)	5	5
silica - crystalline quartz	30 / (% silica +2) (total) 10 / (% silica +2) (respirable)	0.025 (respirable)	0.1

Engineering Controls: Use with adequate general or local exhaust ventilation and to maintain exposure below occupational exposure limits.

Individual Protection Measures (Personal Protective Equipment):

Specific Eye / Face Protection: Safety glasses with side shields. In windy conditions, or if work activity generates elevated airborne dust levels, dust proof or chemical goggles are recommended. Contact lenses should not be worn.

Specific Skin Protection: When there is a risk of skin contact, wear appropriate clothing and gloves to prevent contact.

Specific Respiratory Protection:	If exposure limits are exceeded, an approved particulate respirator, or supplied air respirator, appropriate for the airborne concentrations, should be used. Selection and use of the respiratory protective equipment must be in accordance with applicable regulations and good industrial hygiene practices.
Other:	An emergency eye wash fountain and shower are recommended.

9. Physical & Chemical Properties

Appearance:	White powder
Odor:	Odorless
Odor threshold:	Not Applicable
pH at 25 degrees C:	12.45
Melting Point:	1076 °F (580 °C)
Boiling Point and range:	5162 °F (2850 °C)
Flash Point:	Not Applicable
Evaporation Rate:	Not Applicable
Flammability:	Not Applicable
Upper/lower flammability or explosive limits	Not Applicable
Vapor pressure/density:	Non Volatile
Relative density:	2.24
Solubility:	Slightly soluble in water: 0.2% @ 0 °C. Soluble in acids, glycerin, and sugar solutions
Partition coefficient: n-octanol/water	Not applicable
Auto-ignition temperature:	Not Available
Decomposition temperature:	Not available
Viscosity:	Not Applicable

10. Stability & Reactivity

Reactivity:	Reacts with acids to form calcium salts, releasing heat. Reacts with carbon dioxide in air to form calcium carbonate. See also Incompatibility below.
Chemical stability:	Stable under normal storage and handling conditions.
Possibility of Hazardous Reactions:	See “reactivity” above.
Conditions to avoid:	Vicinity of incompatible materials.

Incompatibility: This product should not be mixed or stored with the following materials, due to the potential for violent reaction and release of heat:

- acids
- reactive fluoridated compounds
- reactive brominated compounds
- reactive powdered metals
- reactive phosphorous compounds
- aluminum powder
- organic acid anhydrides
- nitro-organic compounds
- interhalogenated compounds

Hazardous decomposition products: None

11. Toxicological Information

Likely routes of exposure & symptoms:

Eyes: Contact can cause severe irritation or burning of eyes, including permanent damage.

Skin: Contact can cause severe irritation or burning of skin, especially in the presence of moisture.

Ingestion: This product can cause severe irritation or burning of gastrointestinal tract if swallowed.

Inhalation: This product can cause severe irritation of the respiratory system.

Chronic health effects: This product contains trace amounts of crystalline silica. Prolonged or repeated inhalation of respirable crystalline silica can cause silicosis, as serious lung disease.

Respiratory or skin sensitization: This material is not known to cause sensitization

Germ cell mutagenicity: No data available.

Carcinogenicity: This product is not listed as carcinogenic by OSHA, IARC, NTP, ACGIH, or the EU Directives. This product may contain trace amounts of crystalline silica quartz which is listed by IARC as “Carcinogenic to Humans” (Group 1) and “Known to be a Human Carcinogen" by NTP (National Toxicology Program).

Reproductive toxicity: No Data Available.

Numerical Measures of Toxicity

Crystalline Silica: Oral Rat LD_{50} > 22,500 mg/kg
Calcium Hydroxide: Oral (rat) LD_{50}: 7340 mg/kg

12. Ecological Information

Because of the elevated pH of this product, it might be expected to produce some ecotoxicity upon exposure to certain aquatic organisms and aquatic systems in high concentrations
This material shows no bioaccumulation effect or food chain concentration toxicity.

13. Disposal Considerations

Dispose of contents in accordance with federal, state, provincial and local regulations.

14. Transport Information

Not regulated by Department of Transportation, Transport of Dangerous Goods

15. Regulatory Information

CERCLA Hazardous Substances	Not listed
SARA Toxic Chemical (40 CFR 372.65)	Not listed
SARA Section 302 Extremely Hazardous Substances (40 CFR 355)	Not listed
SARA 311/312	Not listed
SARA Section 313 Toxic Chemicals reporting requirements	None
Threshold planning quantity (TPQ)	Not listed
RCRA Hazardous Waste Classification (40 CFR 261)	Not Classified
EPA Toxic Substances Control Act (TSCA) Status	All of the components of this product are listed on the TSCA
California Proposition 65	Airborne crystalline silica particulates of respirable size are known to the State of California to cause cancer.
NFPA ratings	Health: 3 Fire: 0 Reactivity: 0
HMIS Ratings	Health: 3 Fire: 0 Reactivity: 0 Personal protection: E
OSHA Specifically regulated substance (29 CFR 1910)	Not listed
OSHA Air contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A)	Listed
MSHA	Not listed
Canada DSL	Listed
Canadian WHMIS Classification	D2A, Materials Causing other toxic effects. E, Corrosive Material

Canada CPR	This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation of a Canada and this SDS contains all the required information.
Ontario Regulations	Refer to Regulation 845: Designated Substances - Silica

16. Other Information

List of GHS Hazard Statements:	H315: Causes skin irritation H318: Causes serious eye damage H335: May cause respiratory irritation. H350: May cause cancer through inhalation
List of GHS Precautionary Statements:	P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P233: Keep container tightly closed P260: Do not breathe dust. P264: Wash thoroughly after handling. P270: Do not eat, drink or smoke when using this product. P271: Use only outdoors or in well-ventilated area P280: Wear protective gloves, clothing and eye protection

Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act	IARC	International Agency for Research on Cancer
NTP	National Toxicology Program		

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SECTION I-MATERIAL IDENTIFICATION AND USE

Material Name/Identifier:	**Hydraulic Oil**	**Stock No.**	**929/930/931/932/933/934/935/936/937**
Manufacturer's Name:	**Kleen-Flo Tumbler Industries Ltd**	**Street Address:**	**75 Advance Blvd.**
City:	**Brampton**	**Province:**	**Ontario**
Postal Code:	**L6T 4N1**	**Emergency Phone #:**	**(905) 793-4311**
Chemical Name:	**N.Ap. (Mixture)**	**Chemical Family:**	**Petroleum Oil**
Chemical Formula:	**N.Ap. (Mixture)**	**Trade Names & Synonyms:**	**Hydraulic Oil**
Material Use:	**Lubricating Hydraulic Oil**	**Molecular Weight:**	**N.Ap.**

SECTION II-HAZARDOUS INGREDIENTS OF MATERIAL

Hazardous Ingredients	C.A.S.	Approximate Conc. %wt.	LD50 Species & Route	LC50 Species & Route
Mineral oil, Petroleum base	64742-65-0	80 - 100	N/Av.	N/Av.
Antiwear additive*	N/Av.	0.1 - 1.0	N/Av.	N/Av.
Zinc alkyldithiophosphate	68649-42-3	0.1 - 1.0	N/Av.	N/Av.

This material is not known to contain any chemicals listed as carcinogenicor suspected carcinogenic by the US OSHA, IRAC or US National Toxicology program at concentration greater than 0.1%.

***It was reported to the U.S. EPA that in preliminary tests, certain zinc dialkyldithiophosphates, when applied to the skin of male rabbits over a period of time, adversely affected spermatogenetic activities**

SECTION III-PHYSICAL DATA FOR MATERIAL

Physical State:	**Liquid**	**Odor/Appearance:**	**Characteristic petroleum odor/ clear red oil**
Specific Gravity:	**0.86-0.88**	**Odor Threshold(p.p.m.):**	**N/E**
Boiling Point:	**> 180ºC**	**Evaporation Rate:**	**N/E**
Freezing Point:	**-30ºC**	**Solubility in Water:**	**None**
% Volatile(by volume):	**N/E**	**Vapor Pressure(mm)Hg:**	**N/E**
Vapor Density(Air=1):	**N/E**	**Coefficient of Water/Oil Distribut:**	**N/E**
pH	**N.Ap.**		

SECTION IV-FIRE AND EXPLOSION HAZARD OF MATERIAL

Flammability Yes/No	**No**	**If yes under which conditions?:**	**N.Ap.**
Auto Ignition Temperature	**N/E**	**Means of Extinction: carbon dioxide, dry chemical, foam, water fog**	
Flashpoint and Method:	**171ºC**	**Hazardous Combustion Products: oxides of carbon, sulfur,**	
	Tag C.C	**phosphorous, calcium, zinc**	
Upper Flammable limit (%vol)	**N/E**	**Lower Flammable Limit(% by volume):**	**N/E**
Explosion Data:	**Sensitivity to Mechanical Impact: No**	**Sensitivity to Static Discharge:**	**No**

SECTION V-REACTIVITY DATA

Chemical Stability Yes/No:	**Yes**	**If NO under which conditions?**	**N.Ap.**
Incompatibility to Other Substances Yes/No:	**Yes**	**If so which ones? Avoid acids, oxidizing agents & halogens**	
Reactivity and under what conditions?	**Open flame, fire**		
Hazardous Decomposition Products:	**Oxides of carbon, sulfur, phosphorus, calcium and zinc**		

N/E: not established **N.Ap.: not applicable** **N/Av.: not available**

SECTION VI-TOXICOLOGICAL PROPERTIES OF PRODUCT

Route of Entry:	--SKIN CONTACT -x-SKIN ABSORPTION -x-EYE CONTACT --INHALATION -x-INGESTION		
Effects of Acute Exposure:	May cause eye irritation, nausea vomiting, cough, pulmonary edema, dizziness.		
Effects of Chronic Exposure:	None known		
LD 50 of Product:	N/Av.	LC 50 of Product:	N/Av.
Irritancy of Product:	slight eye irritant	Exposure Limits of Product: ACGIH: 5mg/m3, oil mist.	
Sensitization of Product:	N/E	Toxicologically Synergistic Materials:	N/Av.
--CARCINOGENICITY --REPRODUCTIVE EFFECTS --TERATOGENICITY --MUTAGENICITY			none known

SECTION VII-PREVENTIVE MEASURES

Personal Protective Equipment to be used:

Gloves(specify):	Neoprene or nitrite rubber	Eye(specify):	Safety glasses
Respiratory(specify):	Not Required in normal use	Clothing:	Not Required
Respiratory Protection:	If used indoors or on a continuous basis, use of cartridge type respirator is recommended		
Engineering Controls:	Local and mechanical ventilation		
Leak and Spill Procedure:	Dyke and absorb spill with inert material. Pick up free liquid for recycling. Keep spill out of sewers.		
	Wash area with detergent and water.		
Waste Disposal:	Dispose according to federal, state (Provincial) and local regulations		
Storage Requirements:	Keep at room temperature		
Handling Procedures and	No special procedure required.		
Equipment:			
DSL listing	All components in this material is listed on DSL.		
TDG Classification:	Non-regulated		
WHMIS Classification:	Non-controlled		

SECTION VIII-FIRST AID MEASURES

Eye:	Wash with water for at least 15 minutes. Seek medical help if irritation persists.
Skin:	Wash with soap and water
Inhalation:	Remove patient from further exposure. Avoid aspiration. Seek medical attention
Ingestion:	DO NOT INDUCE VOMITING.If spontaneouse vomiting occurs, hold patient's head below hips.
	Seek medical attention immediately.

SECTION IX-PREPARATION DATE OF M.S.D.S.

Additional Info/Comments:		Sources Used: Handbook of Poisoning By: R.H. Dreisbach	
Phone Number:	(905) 793-4311	Prepared By: Quality Control Laboratory	
Date Prepared:	January 16, 2009.	Kleen-Flo Tumbler Industries Limited	

THIS SHEET SUPERSEDES ANY OTHER M.S.D.S. PREVIOUSLY PREPARED

Fisher Scientific

Part of Thermo Fisher Scientific

SAFETY DATA SHEET

Creation Date 24-Aug-2009 **Revision Date** 28-Oct-2014 **Revision Number** 1

1. Identification

Product Name **Hydrochloric Acid**

Cat No. : **A144-212; A144-212LC; A144-500; A144-500LB; A144-500LC; A144-612GAL; A144C-212; A144C-212EA; A144P-19; A144P-20; A144S-212; A144S-212EA; A144S-500; A144SI-212**

Synonyms Muriatic acid

Recommended Use Laboratory chemicals.

Uses advised against No Information available

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Skin Corrosion/irritation	Category 1 B
Serious Eye Damage/Eye Irritation	Category 1
Specific target organ toxicity (single exposure) Target Organs - Respiratory system.	Category 3
Specific target organ toxicity - (repeated exposure) Target Organs - Kidney, Liver.	Category 2

Label Elements

Signal Word
Danger

Hazard Statements
May be corrosive to metals

Causes severe skin burns and eye damage
May cause respiratory irritation
May cause damage to organs through prolonged or repeated exposure

Precautionary Statements
Prevention
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area
Keep only in original container
Response
Immediately call a POISON CENTER or doctor/physician
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Skin
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Ingestion
IF SWALLOWED: Rinse mouth. DO NOT induce vomiting
Spills
Absorb spillage to prevent material damage
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Store in corrosive resistant polypropylene container with a resistant inliner
Store in a dry place
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
None identified

3. Composition / information on ingredients

Component	CAS-No	Weight %
Water	7732-18-5	62-65
Hydrochloric acid	7647-01-0	35-38

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.

Inhalation Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Immediate medical attention is required.

Ingestion Do not induce vomiting. Call a physician or Poison Control Center immediately.

Most important symptoms/effects Causes burns by all exposure routes. . Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.

Unsuitable Extinguishing Media No information available

Flash Point No information available
Method - No information available

Autoignition Temperature No information available
Explosion Limits
Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
Corrosive Material. Causes burns by all exposure routes. Thermal decomposition can lead to release of irritating gases and vapors.

Hazardous Combustion Products
Hydrogen chloride gas
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
3	0	0	N/A

6. Accidental release measures

Personal Precautions Use personal protective equipment. Ensure adequate ventilation. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Do not get in eyes, on skin, or on clothing.

Environmental Precautions Should not be released into the environment. See Section 12 for additional ecological information.

Methods for Containment and Clean Up Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling Wear personal protective equipment. Do not breathe vapors or spray mist. Do not get in eyes, on skin, or on clothing. Do not ingest.

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH
Hydrochloric acid	Ceiling: 2 ppm	Ceiling: 5 ppm Ceiling: 7 mg/m³ (Vacated) Ceiling: 5 ppm (Vacated) Ceiling: 7 mg/m³	IDLH: 50 ppm Ceiling: 5 ppm Ceiling: 7 mg/m³

Component	Quebec	Mexico OEL (TWA)	Ontario TWAEV
Hydrochloric acid	Ceiling: 5 ppm Ceiling: 7.5 mg/m³	Ceiling: 5 ppm Ceiling: 7 mg/m³	CEV: 2 ppm

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	pungent
Odor Threshold	No information available
pH	< 1
Melting Point/Range	-35 °C / -31 °F
Boiling Point/Range	57 °C / 135 °F @ 760 mmHg
Flash Point	No information available
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	125 mbar @ 20 °C
Vapor Density	1.27 (Air = 1.0)
Relative Density	1.18
Solubility	Soluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	1.8 mPa.s @ 15°C
Molecular Formula	HCl.H2O
Molecular Weight	36.46

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Incompatible products. Excess heat.

Incompatible Materials Metals, Strong oxidizing agents, sodium hypochlorite, Amines, Bases, Fluorine, Cyanides, alkaline

Hazardous Decomposition Products Hydrogen chloride gas

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions Contact with metals may evolve flammable hydrogen gas.

11. Toxicological information

Acute Toxicity

Product Information

Oral LD50 Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

Dermal LD50 Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

Vapor LC50 Based on ATE data, the classification criteria are not met. ATE > 20 mg/l.

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Hydrochloric acid	238 - 277 mg/kg (Rat)	5010 mg/kg (Rabbit)	1.68 mg/L (Rat) 1 h

Toxicologically Synergistic Products No information available

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

Irritation Causes burns by all exposure routes

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Water	7732-18-5	Not listed	Not listed	Not listed	Not listed	Not listed
Hydrochloric acid	7647-01-0	Group 3	Not listed	Not listed	Not listed	Not listed

IARC: (International Agency for Research on Cancer)

IARC: (International Agency for Research on Cancer)
Group 1 - Carcinogenic to Humans
Group 2A - Probably Carcinogenic to Humans
Group 2B - Possibly Carcinogenic to Humans

Mutagenic Effects Mutagenic effects have occurred in experimental animals.

Reproductive Effects Experiments have shown reproductive toxicity effects on laboratory animals.

Developmental Effects Developmental effects have occurred in experimental animals.

Teratogenicity Teratogenic effects have occurred in experimental animals.

STOT - single exposure Respiratory system

STOT - repeated exposure Kidney Liver

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

Endocrine Disruptor Information No information available

Other Adverse Effects See actual entry in RTECS for complete information.

12. Ecological information

Ecotoxicity

Do not empty into drains.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Hydrochloric acid	-	282 mg/L LC50 96 h	-	-

Persistence and Degradability Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its water solubility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN1789
Proper Shipping Name HYDROCHLORIC ACID
Hazard Class 8
Packing Group II

TDG

UN-No UN1789
Proper Shipping Name HYDROCHLORIC ACID
Hazard Class 8
Packing Group II

IATA

UN-No UN1789
Proper Shipping Name Hydrochloric acid
Hazard Class 8
Packing Group II

IMDG/IMO

UN-No UN1789
Proper Shipping Name Hydrochloric acid
Hazard Class 8
Packing Group II

15. Regulatory information

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Water	X	X	-	231-791-2	-		X	-	X	X	X
Hydrochloric acid	X	X	-	231-595-7	-		X	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Hydrochloric acid	7647-01-0	35-38	1.0

SARA 311/312 Hazardous Categorization

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Hydrochloric acid	X	5000 lb	-	-

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Hydrochloric acid	X		-

OSHA Occupational Safety and Health Administration
Not applicable

Component	Specifically Regulated Chemicals	Highly Hazardous Chemicals
Hydrochloric acid	-	TQ: 5000 lb

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Hydrochloric acid	5000 lb	5000 lb

California Proposition 65 This product does not contain any Proposition 65 chemicals

State Right-to-Know

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Hydrochloric acid	X	X	X	X	X

U.S. Department of Transportation

Reportable Quantity (RQ):	Y
DOT Marine Pollutant	N
DOT Severe Marine Pollutant	N

U.S. Department of Homeland Security
This product contains the following DHS chemicals:

Component	DHS Chemical Facility Anti-Terrorism Standard
Hydrochloric acid	0 lb STQ (anhydrous); 11250 lb STQ (37% concentration or greater)

Other International Regulations

Mexico - Grade No information available

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR

WHMIS Hazard Class

D1A Very toxic materials
D2B Toxic materials
E Corrosive material

16. Other information

Prepared By

Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 24-Aug-2009
Revision Date 28-Oct-2014
Print Date 28-Oct-2014
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

Disclaimer

The information provided on 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 guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as 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 material or in any process, unless specified in the text.

End of SDS

Material Safety Data Sheet

1. Chemical product and company identification

Product name GLUE 2

MSDS # 463236

Historic MSDS #: 16028-AE

Code 463236-US03

Manufacturer Castrol Industrial North America, Inc.
150 W. Warrenville Road
Naperville, IL 60563

Supplier Castrol Industrial North America, Inc.
150 W. Warrenville Road
Naperville, IL 60563
Product Information: 1-800-621-2661

EMERGENCY SPILL INFORMATION: 1 (800) 424-9300 CHEMTREC (USA)

2. Composition/information on ingredients

Ingredient name	CAS #	% by weight
Gas oil - unspecified	64742-46-7	20 - 25

3. Hazards identification

Physical state Liquid.

Color Clear. Amber. (Light.)

Emergency overview CAUTION!

MAY CAUSE EYE IRRITATION.
MAY CAUSE SKIN IRRITATION.
MAY CAUSE RESPIRATORY TRACT IRRITATION.

Avoid contact with eyes, skin and clothing. In accordance with good industrial hygiene and safety work practices, airborne exposures should be controlled to the lowest extent practicable. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

Routes of entry Dermal contact. Eye contact. Inhalation. Ingestion.

Potential health effects

Eyes May cause eye irritation.

Skin May cause skin irritation.

Inhalation May cause respiratory tract irritation.

Ingestion No significant health hazards identified.

Medical conditions aggravated by over-exposure None identified.

See toxicological Information (section 11).

4. First aid measures

Eye contact In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation develops.

Skin contact Immediately wash exposed skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.

Inhalation If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if irritation develops.

Ingestion Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately.

5. Fire-fighting measures

Flammability of the product May be combustible at high temperature.

Flash point >230 °C (Open cup) Cleveland.

Products of combustion These products are carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide).

Unusual fire/explosion hazards This material is not explosive as defined by established regulatory criteria.

Fire-fighting media and instructions In case of fire, use water fog, foam, dry chemicals, or carbon dioxide.

Protective clothing (fire) Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

6. Accidental release measures

Personal precautions Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (See Section: "Exposure controls/personal protection"). Follow all fire fighting procedures (See Section: "Fire-fighting measures").

Environmental precautions and clean-up methods If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) scoop up material and place in a sealed, liquid-proof container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Avoid contact of spilled material with soil and prevent runoff entering surface waterways. See Section 13 for Waste Disposal Information.

Personal protection in case of a large spill Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

7. Handling and storage

Handling Avoid contact with skin and clothing. Avoid contact with eyes. Use only with adequate ventilation. In accordance with good industrial hygiene and safety work practices, airborne exposures should be controlled to the lowest extent practicable. Wash thoroughly after handling.

Storage Keep container tightly closed. Keep container in a cool, well-ventilated area. Empty containers may contain harmful, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards.

8. Exposure controls/personal protection

Occupational exposure limits

Ingredient name	Occupational exposure limits
Gas oil - unspecified	**ACGIH (United States).** STEL: 10 mg/m^3 15 minute(s). Form: Oil mist, mineral TWA: 5 mg/m^3 8 hour(s). Form: Oil mist, mineral **OSHA (United States).** TWA: 5 mg/m^3 8 hour(s). Form: Oil mist, mineral

Control Measures Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.

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.

Personal protection

Eyes Avoid contact with eyes. Chemical splash goggles.

Skin and body Avoid contact with skin and clothing. Wear suitable protective clothing.

Respiratory Use only with adequate ventilation. In accordance with good industrial hygiene and safety work practices, airborne exposures should be controlled to the lowest extent practicable.

Hands Wear suitable gloves.

Not available.

Consult local authorities for acceptable exposure limits.

9. Physical and chemical properties

Physical state Liquid.

Odor Slight.

Color Clear. Amber. (Light.)

Heat of combustion Not available.

Specific gravity 0.88 to 0.9

Density 890 kg/m^3 (0.89 g/cm^3) at 15.6°C

Solubility Insoluble in cold water.

10. Stability and reactivity

Stability and reactivity The product is stable.

Conditions to avoid Not available.

Incompatibility with various substances Reactive or incompatible with the following materials: oxidizing materials.

Hazardous decomposition products Not available.

Hazardous polymerization Not available.

11. Toxicological information

Chronic toxicity

Carcinogenic effects

No component of this product at levels greater than 0.1% is identified as a carcinogen by ACGIH or the International Agency for Research on Cancer (IARC). No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program (NTP) or the U.S. Occupational Safety and Health Act (OSHA).

Mutagenic effects

No component of this product at levels greater than 0.1% is classified by established regulatory criteria as a mutagen.

Reproductive effects

No component of this product at levels greater than 0.1% is classified by established regulatory criteria as a reproductive toxin.

Teratogenic effects

No component of this product at levels greater than 0.1% is classified by established regulatory criteria as teratogenic or embryotoxic.

12. Ecological information

Ecotoxicity

No testing has been performed by the manufacturer.

13. Disposal considerations

Waste information

Avoid contact of spilled material and runoff with soil and surface waterways. Consult an environmental professional to determine if local, regional or national regulations would classify spilled or contaminated materials as hazardous waste. Use only approved transporters, recyclers, treatment, storage or disposal facilities. Dispose of in accordance with all applicable local and national regulations.

Consult your local or regional authorities.

14. Transport information

Not classified as hazardous for transport (DOT, TDG, IMO/IMDG, IATA/ICAO)

15. Regulatory information

U.S. Federal regulations

US INVENTORY (TSCA): In compliance.

TSCA 12(b) one-time export notification:: Diphenylamine

This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: GLUE 2

SARA 313

Form R - Reporting requirements

This product does not contain any hazardous ingredients at or above regulated thresholds.

Supplier notification

This product does not contain any hazardous ingredients at or above regulated thresholds.

CERCLA Sections 102a/103 Hazardous Substances (40 CFR Part 302.4):: This material is not regulated under CERCLA Sections 103 and 107.

State regulations

Pennsylvania RTK:oleic acid (generic environmental hazard)

California Prop 65: No products were found

Inventories

AUSTRALIAN INVENTORY (AICS): In compliance.

CANADA INVENTORY (DSL): In compliance.

CHINA INVENTORY (IECS): In compliance.

EC INVENTORY (EINECS/ELINCS): In compliance.

JAPAN INVENTORY (ENCS): In compliance.

KOREA INVENTORY (ECL): In compliance.

PHILIPPINE INVENTORY (PICCS): In compliance.

16. Other information

Label requirements

CAUTION!

MAY CAUSE EYE IRRITATION.
MAY CAUSE SKIN IRRITATION.
MAY CAUSE RESPIRATORY TRACT IRRITATION.

HMIS® Rating :

Health	**1**	**-**
Flammability	**1**	
Physical Hazard	**0**	
Personal protection	**B**	

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

Other special considerations

PETROLEUM OIL: STEL = 10 mg/m³. Using terminology of the International Agency for Research on Cancer (IARC), the petroleum distillates listed in Section II are classified by the supplier as severely processed. Not all those listed in Section II may be present. The supplier has stated that these distillates do not require a carcinogen label as defined by OSHA 29 CFR 1910.1200.

History

Date of issue 07/13/2006.

Date of previous issue 08/15/2005.

Prepared by Product Stewardship

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 us.

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.

Safety Data Sheet

According to OSHA HCS 2012 (29 CFR 1910.1200)

Section 1: Identification

Product Identifier: **Jet A**

Other means of identification: Aviation Fuel; Aviation Fuel – Jet; Aviation Turbine Fuel; Jet 51 Grade; Jet 54 Grade; Jet 56 Grade; JAA with Additives; JAA without Additives; JAA with CI Additive; Jet A 1; Jet A LS; Jet Buckeye 182; Jet FTZ; Jet Fuel; Jet Low Aromatic; Jet Raw; Turbine Fuel

SDS Number: **001975**

MARPOL Annex I Category: Kerosenes

Intended Use: Aviation Turbine Fuel

Uses Advised Against: All others

Emergency Health and Safety Number: CHEMTREC 800-424-9300 (24 Hours)
CANUTEC 613-996-6666
CHEMTREC Mexico 01-800-681-9531

Manufacturer:
66 Aviation Products
A Division of Phillips 66 Company
600 N. Dairy Ashford
Houston, Texas 77079-1175

SDS Information:
Phone: 800-762-0942
Email: SDS@P66.com

Customer Service:
800-234-6603
Technical Information: 918-977-4224

Section 2: Hazards Identification

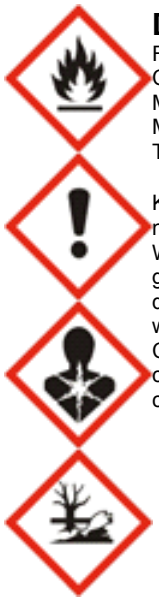
Classified Hazards

H226 -- Flammable liquids -- Category 3
H315 -- Skin corrosion/irritation -- Category 2
H304 -- Aspiration Hazard -- Category 1
H336 -- Specific target organ toxicity (single exposure) -- Category 3
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2

Other Hazards

Electrostatic charge may be generated during pumping and other operations

Label Elements



DANGER

Flammable liquid and vapor
Causes skin irritation
May be fatal if swallowed and enters airways
May cause drowsiness or dizziness
Toxic to aquatic life with long lasting effects

Keep away from heat/sparks/open flames/hot surfaces. - No smoking; Ground/bond container and receiving equipment; Use only non-sparking tools; Take precautionary measures against static discharge; Avoid breathing dust/fume/gas/mist/vapours/spray; Wash thoroughly after handling; Use only outdoors or in a well-ventilated area; Avoid release to the environment; Wear protective gloves / protective clothing / eye protection / face protection; IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician; Do NOT induce vomiting; IF ON SKIN: Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower; IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing; Call a POISON CENTER or doctor/physician if you feel unwell; Take off contaminated clothing and wash before reuse; In case of fire: Use dry chemical, carbon dioxide, or foam for extinction; Store in a well-ventilated place. Keep container tightly closed; Dispose of contents/container to approved disposal facility

Section 3: Composition / Information on Ingredients

Chemical Name	CASRN	Concentration[1]
Petroleum distillates, hydrotreated light	64742-47-8	0-100
Kerosine, petroleum, hydrodesulfurized	64742-81-0	0-100
Kerosine, petroleum	8008-20-6	0-100
Naphthalene	91-20-3	<1

Total Sulfur: < 0.4 wt%

[1] All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Section 4: First Aid Measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If breathing is difficult, oxygen or artificial respiration should be administered by qualified personnel. If symptoms persist, seek medical attention.

Ingestion (Swallowing): Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

Most important symptoms and effects, both acute and delayed: While significant vapor concentrations are not likely, high concentrations can cause minor respiratory irritation, headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Ingestion can cause irritation of the digestive tract, nausea, diarrhea, and vomiting. Dry skin and possible irritation with repeated or prolonged exposure.

Section 5: Fire-Fighting Measures

NFPA 704 Hazard Class

Health: 1 **Flammability:** 2 **Instability:** 0

0 (Minimal)
1 (Slight)
2 (Moderate)
3 (Serious)
4 (Severe)

Extinguishing Media: Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

Specific hazards arising from the chemical

Unusual Fire & Explosion Hazards: Flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of nitrogen and sulfur may also be formed.

Special protective actions for firefighters: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods and material for containment and cleaning up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

Section 7: Handling and Storage

Precautions for safe handling: Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static discharge. Nonsparking tools should be used. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8). Flammable. May vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas. Open container slowly to relieve any pressure. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-70 and/or API RP 2003 for specific bonding/grounding requirements. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of incomplete combustion products (e.g. carbon monoxide, oxides of sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels.

Static Accumulation Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding of tanks, transfer piping, and storage tank level floats are necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. Special care should be given to ensure that special slow load procedures for "switch loading" are followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil or diesel) is loaded into tanks previously containing low flash point products (such as gasoline or naphtha). For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

Conditions for safe storage: Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Section 8: Exposure Controls / Personal Protection

Chemical Name	ACGIH	OSHA	Other
Petroleum distillates, hydrotreated light	TWA: 200 mg/m³ Skin	---	200 mg/m³ TWA8hr 100 mg/m³ TWA12hr 28 ppm TWA8hr 14 ppm TWA12hr (Phillips 66 Guidelines)
Kerosine, petroleum, hydrodesulfurized	TWA: 200 mg/m³ Skin	---	200 mg/m³ TWA8hr 100 mg/m³ TWA12hr 28 ppm TWA8hr 14 ppm TWA12hr (Phillips 66 Guidelines)
Kerosine, petroleum	TWA: 200 mg/m³ Skin	---	200 mg/m³ TWA8hr 100 mg/m³ TWA12hr 28 ppm TWA8hr 14 ppm TWA12hr (Phillips 66 Guidelines)
Naphthalene	STEL: 15 ppm TWA: 10 ppm 10 ppm TWA; skin; A3 - confirmed animal carcinogen with unknown relevance to humans; TLV basis: upper respiratory tract irritation Skin	TWA: 10 ppm : 50 mg/m³	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Depending on exposure and use conditions, additional protection may be necessary to prevent skin contact including use of items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. Suggested protective materials: Nitrile

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with organic vapor cartridges/canisters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

Section 9: Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance: clear, light yellow or light green
Physical Form: Liquid
Odor: Kerosene
Odor Threshold: No data
pH: Not applicable
Vapor Density (air=1): > 4.5
Upper Explosive Limits (vol % in air): 4.7
Lower Explosive Limits (vol % in air): 0.6
Evaporation Rate (nBuAc=1): <1
Particle Size: Not applicable
Percent Volatile: 98-100% @ 545ºF (285ºC)
Flammability (solid, gas): Not applicable

Flash Point: 100-150 °F / 38-66 °C
Test Method: Tag Closed Cup (TCC), ASTM D56
Initial Boiling Point/Range: 300 - 572 °F / 149 - 300 °C
Vapor Pressure: 0.40 mmHg
Partition Coefficient (n-octanol/water) (Kow): No data
Melting/Freezing Point: < -40 °F / < -40 °C
Auto-ignition Temperature: 410 °F / 210 °C
Decomposition Temperature: No data
Specific Gravity (water=1): 0.775-0.840 @ 68ºF (20ºC)
Bulk Density: 6.73 lbs/gal
Viscosity: 1.5-2.5 cSt typical @ 68ºF (20ºC) / 8 max cSt @ -4°F (-20°C)
Solubility in Water: <0.1%

Section 10: Stability and Reactivity

Reactivity: Not chemically reactive.

Chemical stability: Stable under normal ambient and anticipated conditions of use.

Possibility of hazardous reactions: Hazardous reactions not anticipated.

Conditions to avoid: Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

Incompatible materials: Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous decomposition products: Not anticipated under normal conditions of use.

Section 11: Toxicological Information

Information on Toxicological Effects of Substance/Mixture

Substance / Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Expected to have a low degree of toxicity by inhalation		>5.2 mg/L (mist)
Dermal	Unlikely to be harmful		> 2 g/kg
Oral	Unlikely to be harmful		> 5 g/kg

Aspiration Hazard: May be fatal if swallowed and enters airways.

Skin Corrosion/Irritation: Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Skin Sensitization: Not expected to be a skin sensitizer.

Respiratory Sensitization: No information available.

Specific Target Organ Toxicity (Single Exposure): May cause drowsiness and dizziness.

Specific Target Organ Toxicity (Repeated Exposure): Not expected to cause organ effects from repeated exposure.

Carcinogenicity: Not expected to cause cancer. Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation.

Germ Cell Mutagenicity: Not expected to cause heritable genetic effects.

Reproductive Toxicity: Not expected to cause reproductive toxicity. Hydrodesulfurized kerosene applied to the skin of female rats at 494, 330, or 165 mg/kg daily for 7 consecutive weeks (premating, mating, and gestation), or for 8 consecutive weeks in males did not result in systemic, reproductive, or developmental toxicity.

Information on Toxicological Effects of Components

Naphthalene

Carcinogenicity: Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The US National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

Section 12: Ecological Information

GHS Classification:
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2
Toxic to aquatic life with long lasting effects.

Toxicity: Acute aquatic toxicity studies on samples of jet fuel and kerosine streams show acute toxicity values greater than 1 mg/L and mostly in the range 1-100 mg/L. These tests were carried out on water accommodated fractions, in closed systems to prevent evaporative loss. Results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon composition. Kerosines should be regarded as toxic to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment.

Persistence and Degradability: The hydrocarbons in this material are not readily biodegradable but are regarded as inherently biodegradable since their hydrocarbon components can be degraded by microorganisms.

Persistence per IOPC Fund definition: Non-Persistent

Bioaccumulative Potential: Hydrocarbon constituents of kerosine show measured or predicted Log Kow values ranging from 3 to 6 and above and therefore would be regarded as having the potential to bioaccumulate. In practice, metabolic processes may reduce bioconcentration.

Mobility in Soil: On release to water, hydrocarbons will float on the surface and since they are sparingly soluble, the only significant loss is volatilization to air. It is possible that some of the higher molecular weight hydrocarbons will be adsorbed on sediment. Biodegradation in water is a minor loss process. In air, these hydrocarbons are photodegraded by reaction with hydroxyl radicals with half lives varying from 0.1 to 0.7 days.

Other adverse effects: None anticipated.

Section 13: Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations. This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the SDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)
• D001 - Ignitability characteristic

Section 14: Transport Information

U.S. Department of Transportation (DOT)

Shipping Description:	*Aquatic toxicity studies indicate this material may be classified as a Marine Pollutant under IMDG Code. It is not currently regulated as a marine pollutant by the USDOT. If there is not a Shipping Description or other DOT marking, labeling, placarding and packaging references shown in this section, it is not regulated as a hazardous material by the USDOT.* UN1863, Fuel, aviation, turbine engine, Combustible liquid *or* 3, III
Non-Bulk Package Marking:	None *or* Fuel, aviation, turbine engine, UN1863
Non-Bulk Package Labeling:	none *or* Flammable liquid
Bulk Package/Placard Marking:	Combustible *or* Flammable/1863
Packaging - References:	None; None; 49 CFR 173.241 *or* 49 CFR 173.150; 173.203; 173.241 *(Exceptions; Non-bulk; Bulk)*
Hazardous Substance:	See Section 15 for RQ`s
Emergency Response Guide:	128
Note:	*This product may be classified as a Combustible Liquid for domestic land transportation under 49 CFR 173.150(f).Combustible liquids are not regulated by DOT in non-bulk quantities shipped by land.* *If this material is determined to be a Marine Pollutant, it CANNOT be reclassified as a Combustible Liquid.* *Container(s) greater than 5 liters (liquids) or 5 kilograms (solids), shipped by water mode and ALL bulk shipments may require the shipping description to contain the "Marine Pollutant" notation [49 CFR 172.203(l)] and the container(s) to display the [Marine Pollutant Mark] [49 CFR 172.322].*

International Maritime Dangerous Goods (IMDG)

Shipping Description:	UN1863, Fuel, aviation, turbine engine, 3, III, (FP° C cc), *[where FP is the material's flash point in degrees Celsius closed cup]*
Non-Bulk Package Marking:	Fuel, aviation, turbine engine, UN1863
Labels:	Flammable liquid
Placards/Marking (Bulk):	Flammable/1863
Packaging - Non-Bulk:	P001
EMS:	F-E, S-E

Note: *U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25. If container(s) is greater than 5 liters (liquids) or 5 kilograms (solids), shipment may require the shipping description to contain the "Marine Pollutant" description [IMDG 5.4.1.4.3.5] and the container(s) to display the Marine Pollutant mark [IMDG 5.2.1.6]. If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.*

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:
Not applicable

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)

UN/ID #: UN1863
Proper Shipping Name: Fuel, aviation, turbine engine
Hazard Class/Division: 3
Subsidiary risk: none
Packing Group: III
Non-Bulk Package Marking: Fuel, aviation, turbine engine, UN1863
Labels: Flammable liquid
ERG Code: 3L
Note: *U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 24. If container(s) is greater than 5 liters (liquids) or 5 kilograms (solids), shipment may require the container to display the "Environmentally hazardous substance" mark [IATA 7.1.6.3].*

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y344	355	366
Max. Net Qty. Per Package:	10 L	60 L	220 L

Section 15: Regulatory Information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):
This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health Hazard: Yes
Chronic Health Hazard: Yes
Fire Hazard: Yes
Pressure Hazard: No
Reactive Hazard: No

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Chemical Name	Concentration[1]	de minimis
Naphthalene	<1	0.1%

EPA (CERCLA) Reportable Quantity (in pounds):
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

California Proposition 65:
Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the warning requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Chemical Name	Type of Toxicity
Toluene	Developmental Toxicant Female Reproductive Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant

Naphthalene	Cancer

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

WHMIS Hazard Class:
B3 - Combustible liquid
D2B - Toxic materials

National Chemical Inventories
All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.
All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

Section 16: Other Information

Date of Issue:	Previous Issue Date:	SDS Number:	Status:
10-Apr-2014	04-Apr-2014	001975	FINAL

Revised Sections or Basis for Revision:
Exposure limits (Section 8)

Guide to Abbreviations:
ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and implied Warranties:
The information presented in this Safety Data Sheet is based on data believed to be accurate as of the date this Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

Material Safety Data Sheet

EMERGENCY NUMBERS:

(USA) CHEMTREC : 1(800) 424-9300 (24hrs)
(CAN) CANUTEC : 1(613) 996-6666 (24hrs)
(USA) Anachemia : 1(518) 297-4444
(CAN) Anachemia : 1(514) 489-5711

WHMIS	Protective Clothing	TDG Road/Rail
WHMIS CLASS: C D-1A D-2A		TDG CLASS: 5.1 6.1 PIN: UN1469 PG: II
		

Section I. Product Identification and Uses

Product name	**LEAD NITRATE**
Chemical formula	Pb(NO3)2
Synonyms	Lead dinitrate, Lead(II) nitrate, AC-5394, AC-5394P, AC-5394T, 51014, 51026, 51034
Supplier	Anachemia Canada. 255 Norman. Lachine (Montreal), Que H8R 1A3
Material uses	For laboratory use only.

CI#	Not available.
CAS#	10099-74-8
Code	AC-5394
Formula weight	331.20
Supersedes	

Section II. Ingredients

Name	CAS #	%	TLV
1) LEAD NITRATE	10099-74-8	95-100	Exposure limits: ACGIH (Lead, elemental and inorganic compounds (as Pb)) TWA 0.05 mg(Pb)/m3

Toxicity values of the hazardous ingredients

LEAD NITRATE:
INTRAPERITONEAL (LD50): Acute: 74 mg/kg (Mouse).
INTRAVENOUS (LD50): Acute: 93 mg/kg (Rat).

Section III. Physical Data

Physical state and appearance / Odor	White odorless crystals.
pH (1% soln/water)	<7
Odor threshold	Not available.
Percent volatile	0% at 21°C
Freezing point	Decomposes at 470°C.
Boiling point	Not applicable.
Specific gravity	4.53 (Water = 1)
Vapor density	11 (Air = 1)
Vapor pressure	Not applicable.
Water/oil dist. coeff.	Not available.
Evaporation rate	Not applicable.
Solubility	Easily soluble in cold water.

Section IV. Fire and Explosion Data

Flash point	Not available.
Flammable limits	Not available.
Auto-ignition temperature	Not available.
Fire degradation products	Oxides of nitrogen and lead. Lead.
Fire extinguishing procedures	Use flooding quantities of water. Wear adequate personal protection to prevent contact with material or its combustion products. Self contained breathing apparatus with a full facepiece operated in a pressure demand or other positive pressure mode. Cool containing vessels with flooding quantities of water until well after fire is out.
Fire and Explosion Hazards	Powerful oxidizing agent; may ignite oxidizable materials. Contributes to combustion of other materials. Container explosion may occur under fire conditions or when heated. Contact with other material may cause fire and/or explosion. When contaminated, it is very sensitive. Contact with other material may form shock, heat or friction sensitive mixtures. May react violently with shock, friction or if heated. Toxic gases are evolved on heating lead nitrate above 205°C.

Section V. Toxicological Properties

Routes of entry	Inhalation and ingestion. Eye contact. Skin contact. Skin absorption.
Effects of Acute Exposure	May be fatal by ingestion, inhalation or skin absorption. Neurotoxin. Acute lead exposure causes reversible kidney damage and anemia. May impair the reproductive systems of both men and women. Damage may also be caused to the unborn fetus. Lead is a cumulative poison and even exposures to small amounts can raise the body's content to toxic levels. Target organs: blood, central nervous system, liver, kidneys, gastrointestinal system, male and female reproductive system, peripheral nervous system, skeletal muscle, brain, thyroid, testis.
Eye	Dust may cause irritation, redness and possible damage due to abrasiveness.
Skin	Contact over short periods of time may cause severe local irritation or burns. Readily absorbed through skin.
Inhalation	Highly toxic! Material is destructive to tissue of the mucous membranes and upper respiratory tract. Local irritation of the bronchi and lungs can occur, in case of acute exposure, symptoms such as metallic taste, chest and abdominal pain, nausea, vomiting, central nervous system depression, numbness, aching muscles, weakness, dyspnea, and increased blood levels may follow. Prolonged exposure or repeated exposure can lead to lead poisoning and death (see ingestion).
Ingestion	Highly toxic. Lead salts may cause fatigue, disturbance of sleep, abdominal pain, nausea, headache, anorexia, metallic taste in mouth, muscle and joint pain, dizziness, colic, paralysis, hypertension, thirst, vomiting, constipation or diarrhea, muscle weakness, irritability, encephalopathy, parasthesia, convulsions, coma and death. Prolonged overexposure can severely damage red blood cell formation, central and peripheral nervous system, lung, liver and kidney damage with oliguria, hematuria, albuminuria, hemoglobinuria. See chronic overexposure. Estimated lethal dose is 0.5 g lead. Nitrates may be reduced to nitrites by bacteria in the digestive tract. Signs and symptomes of nitrite poisoning include methemoglobinemia with cyanosis, nausea, dizziness, increased heart rate and respiratory paralysis.

Section V. Toxicological Properties

Effects of Chronic Overexposure	Symptoms of chronic exposure are like those for ingestion. Lead is a cumulative poison and even exposure to small amounts can raise the body's content to toxic levels. Tiredness, loss of weight, insomnia, blue line on gums, gastrointestinal disorder (constipation and colic), muscle weakness, hypertension with bradycardia, polyneuropathy, nephropathy, anemia, nephritis, encephalopathy, eye, lung, central and peripheral nervous system, liver, kidney, blood, thyroid damage. Reproductive toxin, teratogen, embryotoxic, and carcinogen. Lead compounds may cause testicular damage, sterility, sperm abnormalities, menstrual disorders, adverse effects on general reproductive performance in human. Passes through the placental barrier (can cause birth defects, postnatal development injury, increased foetal lethality and delayed foetal development.). Excreted in maternal milk in animal. To the best of our knowledge, the chemical, physical, and toxicity of this substance has not been fully investigated.

Section VI. First Aid Measures

Eye contact	Immediately flush eyes with copious quantities of water for at least 15 minutes holding lids apart to ensure flushing of the entire surface. Seek immediate medical attention.
Skin contact	Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Seek immediate medical attention. Wash contaminated clothing before reusing. Discard contaminated leather articles such as shoes and belt.
Inhalation	Remove patient to fresh air. Administer approved oxygen supply if breathing is difficult. Administer artificial respiration or CPR if breathing has ceased. Seek immediate medical attention.
Ingestion	If victim is alert and not convulsing, rinse out mouth and give 1/2 to 1 glass of water to dilute. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. Immediately transport victim to an emergency facility. Never give anything by mouth to an unconscious or convulsing person.

Section VII. Reactivity Data

Stability	Stable. Conditions to avoid: High temperatures, sparks, open flames and all other sources of ignition, contamination.
Hazardous decomp. products	Not available.
Incompatibility	May react violently with reducing agents, organic materials, flammable/combustible materials. Because of explosive reaction or explosive compound formation, lead nitrate must not be mixed with ammonium thiocyanate, potassium acetate, lead hypophosphate, metal powders (e.g., aluminum, iron, copper, copper alloys), carbon, boron phosphide, cyanides, esters, phospham, phosphorus, sodium cyanide, hypophosphites, stannous chloride, thiocyanates, isothiocyanates, sulfur, easily oxidizable materials, citric acid, nitrites, phosphinates.
Reaction Products	Contact with other material may cause fire and/or explosion. Avoid contamination with reactive substances. Contact with other material may form shock, heat or friction sensitive mixtures. Hazardous polymerization will not occur.

Section VIII. Preventive Measures

Protective Clothing in case of spill and leak	Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves. Wear disposable coveralls and discard them after use.
Spill and leak	Evacuate the area. Eliminate all sources of ignition. Cover with dry soda ash or lime. Sweep up and place in container for disposal. Avoid raising dust. Use non-sparking tools. Ventilate area and wash spill site after material pick up is complete. DO NOT empty into drains. DO NOT touch damaged container or spilled material. Avoid contact with a combustible material (wood, paper, oil, clothing...). Spills of lead nitrate must be promptly removed.
Waste disposal	Dispose of waste material at an approved (hazardous) waste treatment/ disposal facility in accordance with applicable local, provincial and federal regulations. Harmful to aquatic life at low concentrations. Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.
Storage and Handling	Do not store near flammable or organic substances. Keep at temperature not exceeding 30°C. Store in a cool place away from heated areas, sparks, and flame. Store in a well ventilated area. Store away from incompatible materials. Do not add any other material to the container. Do not wash down the drain. Do not breathe dust. Keep away from direct sunlight or strong incandescent light. Keep container tightly closed and dry. Manipulate under an adequate fume hood. Avoid raising dust. Empty containers may contain a hazardous residue. Handle and open container with care. Minimize dust generation and exposure - use dust mask or appropriate protection. Take off immediately all contaminated clothing. Avoid contact with a combustible material (wood, paper, oil, clothing...). This product must be manipulated by qualified personnel. Do not get in eyes, on skin, or on clothing. Wash well after use. In accordance with good storage and handling practices. Do not allow smoking and food consumption while handling. In case of accident or if you feel unwell, seek medical advice immediately (show the label when possible.). Since the product is unstable, avoid sudden shocks like dropping or rolling. Do not drop, roll or skid container. Do not store on wood floors.

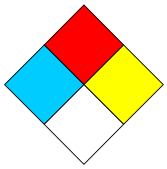
Section IX. Protective Measures

Protective clothing	Splash goggles. Impervious gloves (rubber or plastic), apron, coveralls, and/or other resistant protective clothing. Prior to use, user should confirm impermeability. Sufficient to protect skin. Have available and use as appropriate: face shields, rubber suits, aprons, and boots. A OSHA/MSHA jointly approved respirator is advised in the absence of proper environmental controls. If more than TLV, do not breathe vapor. Wear self-contained breathing apparatus. Do not wear contact lenses. Make eye bath and emergency shower available. Ensure that eyewash station and safety shower is proximal to the work-station location.
Engineering controls	Use in a chemical fume hood to keep airborne levels below recommended exposure limits. Do not use in unventilated spaces. Adequate ventilation and clean up must be maintained to minimize dust accumulation. Dust layers should not be permitted to accumulate.

Section X. Other Information

Special Precautions or comments

Powerful oxidizing agent; may ignite oxidizable materials. Highly toxic! Carcinogen! Mutagen! Reproductive toxin! Teratogen! Embryotoxic! Neurotoxic! Nephrotoxic! Severe irritant! Possible risks of irreversible effects. Danger of cumulative effects. Do not breathe dust. Avoid all contact with the product. Avoid prolonged or repeated exposure. Use in a chemical fume hood. Keep away from heat, sparks and flame. Avoid shock and friction. When contaminated, it is very sensitive. Contact with other material may cause fire and/or explosion. Risk of explosion by shock, friction, fire or other sources of ignition. Handle and open container with care. Container should be opened only by a technically qualified person.
RTECS NO: OG2100000 (Lead nitrate).



NFPA

Prepared by MSDS Department/Département de F.S..

Validated 07-Jan-2013

Telephone# (514) 489-5711

Safety Data Sheet

According to OSHA HCS 2012 (29 CFR 1910.1200)

Section 1: Identification

Product Identifier: **T5X® Heavy Duty Motor Oil**

Other means of identification: T5X® Heavy Duty Motor Oil, SAE 30
T5X® Heavy Duty Motor Oil, SAE 40
T5X® Heavy Duty Motor Oil, SAE 50

SDS Number: **817732**

Intended Use: Heavy Duty Diesel Engine Oil

Uses Advised Against: All others

Emergency Health and Safety Number: Chemtrec: 800-424-9300 (24 Hours)

Manufacturer:
Phillips 66 Lubricants
P.O. Box 4428
Houston, TX 77210

SDS Information:
Phone: 800-762-0942
Email: SDS@P66.com
URL: www.Phillips66.com

Customer Service:
U.S.: 1-800-822-6457 or International: +1-83-2486-3363
Technical Information: 1-877-445-9198

Section 2: Hazards Identification

Classified Hazards
This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Other Hazards
None Known

Label Elements

No classified hazards

Section 3: Composition / Information on Ingredients

Chemical Name	CASRN	Concentration[1]
Residual oils, petroleum, solvent-dewaxed	64742-62-7	0 - 90
Distillates, petroleum, hydrotreated heavy paraffinic	64742-54-7	0 - 90
Non-Hazardous Materials	VARIOUS	<15

[1] All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Section 4: First Aid Measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops and persists, seek medical attention.

Inhalation (Breathing): First aid is not normally required. If breathing difficulties develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. Seek immediate medical attention.

Ingestion (Swallowing): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Most important symptoms and effects, both acute and delayed: Inhalation of oil mists or vapors generated at elevated temperatures may cause respiratory irritation. Accidental ingestion can result in minor irritation of the digestive tract, nausea and diarrhea. Dry skin and possible irritation with repeated or prolonged exposure.

Notes to Physician: Acute aspirations of large amounts of oil-laden material may produce a serious aspiration pneumonia. Patients who aspirate these oils should be followed for the development of long-term sequelae. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities.

Section 5: Fire-Fighting Measures

NFPA 704 Hazard Class

Health: 0 **Flammability:** 1 **Instability:** 0

0 (Minimal)
1 (Slight)
2 (Moderate)
3 (Serious)
4 (Severe)

Extinguishing Media: Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F / 100°C. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

Specific hazards arising from the chemical

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of a fire.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of sulfur, nitrogen or phosphorus may also be formed.

Special protective actions for firefighters: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods and material for containment and cleaning up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken. See Section 13 for information on appropriate disposal.

Section 7: Handling and Storage

Precautions for safe handling: Keep away from flames and hot surfaces. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8). Spills will produce very slippery surfaces. Used motor oils have been shown to cause skin cancer in mice after repeated application to the skin without washing. Brief or intermittent skin contact with used motor oil is not expected to cause harm if the oil is thoroughly removed by washing with soap and water. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes.

Conditions for safe storage: Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated area away from heat and all sources of ignition. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Section 8: Exposure Controls / Personal Protection

Chemical Name	ACGIH	OSHA	Other
Residual oils, petroleum, solvent-dewaxed	TWA: 5 mg/m^3 STEL:10 mg/m^3 as Oil Mist, if Generated	TWA: 5 mg/m^3 (as Oil Mist, if generated)	---
Distillates, petroleum, hydrotreated heavy paraffinic	TWA: 5 mg/m^3 STEL:10 mg/m^3 as Oil Mist, if Generated	TWA: 5 mg/m^3 (as Oil Mist, if generated)	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Suggested protective materials: Nitrile

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with R or P95 filters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

Section 9: Physical and Chemical Properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance: brown, Transparent
Physical Form: Liquid
Odor: Petroleum

Flash Point: Minimum 392 °F / 200 °C
Test Method: Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
Initial Boiling Point/Range: No data

Odor Threshold: No data
pH: Not applicable
Vapor Density (air=1): >1
Upper Explosive Limits (vol % in air): No data
Lower Explosive Limits (vol % in air): No data
Evaporation Rate (nBuAc=1): No data
Particle Size: N/A
Percent Volatile: Negligible
Flammability (solid, gas): N/A
Solubility in Water: Negligible

Vapor Pressure: <1 mm Hg
Partition Coefficient (n-octanol/water) (Kow): No data
Melting/Freezing Point: No data <
Auto-ignition Temperature: No data
Decomposition Temperature: No data
Specific Gravity (water=1): 0.878 - 0.889 @ 60ºF (15.6ºC)
Bulk Density: 7.33 - 7.45 lbs/gal
Viscosity: 11 - 20 cSt @ 100°C; 88 - 224 cSt @ 40°C
Pour Point: < -4 °F / < -20 °C

Section 10: Stability and Reactivity

Reactivity: Not chemically reactive.

Chemical stability: Stable under normal ambient and anticipated conditions of use.

Possibility of hazardous reactions: Hazardous reactions not anticipated.

Conditions to avoid: Extended exposure to high temperatures can cause decomposition. Avoid all possible sources of ignition.

Incompatible materials: Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous decomposition products: Not anticipated under normal conditions of use, During use in engines, contamination of oil with low levels of hazardous fuel combustion by-products (e.g. polycyclic aromatic hydrocarbons) may occur. Repeated and prolonged skin contact can cause drying and cracking.

Section 11: Toxicological Information

Information on Toxicological Effects of Substance/Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Unlikely to be harmful		> 5 mg/L (estimate)
Dermal	Unlikely to be harmful		> 2 g/kg (estimate)
Oral	Unlikely to be harmful		> 5 g/kg (estimate)

Aspiration Hazard: Not expected to be an aspiration hazard.

Skin Corrosion/Irritation: Causes mild skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Skin Sensitization: No information available on the mixture, however none of the components have been classified for skin sensitization (or are below the concentration threshold for classification).

Respiratory Sensitization: No information available.

Specific Target Organ Toxicity (Single Exposure): No information available on the mixture, however none of the components have been classified for target organ toxicity (or are below the concentration threshold for classification).

Specific Target Organ Toxicity (Repeated Exposure): No information available on the mixture, however none of the components have been classified for target organ toxicity (or are below the concentration threshold for classification).

Carcinogenicity: No information available on the mixture, however none of the components have been classified for carcinogenicity (or are below the concentration threshold for classification).

Germ Cell Mutagenicity: No information available on the mixture, however none of the components have been classified for germ cell mutagenicity (or are below the concentration threshold for classification).

Reproductive Toxicity: No information available on the mixture, however none of the components have been classified for reproductive toxicity (or are below the concentration threshold for classification).

Information on Toxicological Effects of Components

Lubricant Base Oil (Petroleum)

Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including severe hydrocracking/hydroprocessing to reduce aromatics and improve performance characteristics. All of the oils meet the IP-346 criteria of less than 3 percent PAH's and are not considered carcinogens by NTP, IARC, or OSHA.

Phenol, (tetrapropenyl) derivatives

Reproductive Toxicity: This product contains low levels of phenol, (tetrapropenyl) derivatives. Rats given high, repeated daily doses of phenol, (tetrapropenyl) derivatives by oral intubation experienced adverse reproductive effects. Pregnant rats given high, repeated daily doses of phenol, (tetrapropenyl) derivatives by oral intubation gave birth to pups with cleft palate and skeletal malformations at dose levels that caused maternal toxicity. Follow-up studies of phenol, (tetrapropenyl) derivatives in finished lubricating fluids demonstrated a no-observed effect level of 1.78 wt%.

Section 12: Ecological Information

GHS Classification:
No classified hazards

Toxicity: All acute aquatic toxicity studies on samples of lubricant base oils show acute toxicity values greater than 100 mg/L for invertebrates, algae and fish. These tests were carried out on water accommodated fractions and the results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions.

Persistence and Degradability: The hydrocarbons in this material are not readily biodegradable, but since they can be degraded by microorganisms, they are regarded as inherently biodegradable.

Bioaccumulative Potential: Log Kow values measured for the hydrocarbon components of this material are greater than 5.3, and therefore regarded as having the potential to bioaccumulate. In practice, metabolic processes may reduce bioconcentration.

Mobility in Soil: Volatilization to air is not expected to be a significant fate process due to the low vapor pressure of this material. In water, base oils will float and spread over the surface at a rate dependent upon viscosity. There will be significant removal of hydrocarbons from the water by sediment adsorption. In soil and sediment, hydrocarbon components will show low mobility with adsorption to sediments being the predominant physical process. The main fate process is expected to be slow biodegradation of the hydrocarbon constituents in soil and sediment.

Other adverse effects: None anticipated.

Section 13: Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste and is not believed to exhibit characteristics of hazardous waste. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

This material under most intended uses would become "Used Oil" due to contamination by physical or chemical impurities. Whenever possible, Recycle used oil in accordance with applicable federal and state or local regulations. Container contents should be completely used and containers should be emptied prior to discard.

Section 14: Transport Information

U.S. Department of Transportation (DOT)
Shipping Description: *Not regulated*

Note: *If shipped by land in a packaging having a capacity of 3,500 gallons or more, the provisions of 49 CFR, Part 130 apply. (Contains oil)*

International Maritime Dangerous Goods (IMDG)
Shipping Description: *Not regulated*
Note: *U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25.*

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)
UN/ID #: *Not regulated*
Note: *U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 24.*

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	---	---	---
Max. Net Qty. Per Package:	---	---	---

Section 15: Regulatory Information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):
This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)
Acute Health Hazard: No
Chronic Health Hazard: No
Fire Hazard: No
Pressure Hazard: No
Reactive Hazard: No

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Chemical Name	Concentration[1]	de minimis
Zinc Compound(s)	<1.4	1.0%

EPA (CERCLA) Reportable Quantity (in pounds):
This material does not contain any chemicals with CERCLA Reportable Quantities.

California Proposition 65:
This material does not contain any chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm at concentrations that trigger the warning requirements of California Proposition 65.

International Hazard Classification

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

WHMIS Hazard Class:
none

National Chemical Inventories
All components are either listed on the US TSCA Inventory, or are not regulated under TSCA

All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

Section 16: Other Information

Date of Issue:	Previous Issue Date:	SDS Number:	Status:
14-Aug-2013	06-Dec-2012	817732	FINAL

Revised Sections or Basis for Revision:
Format change; Product Name / Synonyms (Section 1); Composition (Section 3); Physical Properties (Section 9)

Guide to Abbreviations:
ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and implied Warranties:
The information presented in this Safety Data Sheet is based on data believed to be accurate as of the date this Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

SANFORD BRANDS

A Newell Rubbermaid Company

MATERIAL SAFETY DATA SHEET MSDS # 35201

Section One: Identification

Sanford, L.P.
2707 Butterfield Road
Oak Brook, IL 60523 USA
800-323-0749 or 630-481-2000

EMERGENCY MEDICAL NUMBER:

888-786-0972

Product Name: Sharpie Oil-Based Paint Marker, Bold

Colors: Black, Red, Blue, Yellow, White

Sanford is a member of The Art and Creative Materials Institute, Inc. This product is certified by the Institute to be labeled in accordance with the voluntary chronic hazard labeling standard ASTM D-4236 and is labeled with the AP Non Toxic Seal. Products bearing the AP Approved Product Seal of The Art and Creative Materials Institute, Inc. are certified in a program of toxicological evaluation by a medical expert, subject to review by the Institute Toxicology Advisory Board, to contain no materials in sufficient quantities to be toxic or injurious to humans, or to cause acute toxicity or chronic health problems.

Section Two: Hazard Identification

This product is considered safe under normal use conditions.

Section Three: Composition

Ethanol (64-17-5), methoxy propanol (107-98-2), resins, colorants

Section Four: First Aid Measures

Inhalation: This product is considered safe under normal use conditions.

Skin Contact: This product is considered safe under normal use conditions.

Eye Contact: This product is considered safe under normal use conditions.

Ingestion: This product is considered safe under normal use conditions.

Section Five: Fire Fighting Measures

Flash Point: 55F CC (Ethanol)

Flammability Limits (% by volume): Lower: 3.3% (ethanol) Upper: 19% (ethanol)

Extinguishing Media: Dry chemical, carbon dioxide, water, regular foam.

Special Fire Fighting Measures: For large fires, use regular foam or flood with fine spray.

Unusual Fire and Explosion Hazards: Stay upwind and keep out of low areas.

Section Six: Accidental Release Measures

In Case of Spill or Accidental Release: Wipe up with absorbent material.

Section Seven: Handling and Storage

Handling: Np special handling requirements.

Storage: Keep cap on marker when not in use.

Section Eight: Exposure Controls and Personal Protection

Eye Protection: None under normal use conditions.

Clothing: None under normal use conditions.

Respirator: None under normal use conditions.

Ventilation: None under normal use conditions.

Section Nine: Physical and Chemical Properties

For ink unless otherwise specified:

Boiling Point:	172F (ethanol)
Specific Gravity:	Approximately 1.0
Vapor Pressure:	Not determined
Solubility in Water:	Miscible
Evaporation Rate:	Not determined
Appearance/Odor:	Colored liquid; alcohol odor

Section Ten: Stability and Reactivity

Stability:	Stable
Conditions to Avoid:	Avoid heat, flames, sparks, and other sources of ignition.
Chemical Incompatibility:	Strong oxidizers
Hazardous Decomposition:	Oxides of carbon in a fire situation.
Hazardous Polymerization:	Will not occur

Section Eleven: Toxicological Information

See Section Two: Hazard Identification for any hazards

Section Twelve: Ecological Information

Not available

Section Thirteen: Disposal Considerations

Dispose in accordance with Federal, State, and Local Regulations.

Section Fourteen: Transport Information

DOT:	ORM-D Consumer Commodity;
IATA:	Consumer Commodity, 9, ID8000, packing instruction 910
IMO:	Flammable Liquid, n.o.s. (ethanol), 3, UN1993, PGII (55 F CC), Ltd Qtys, EmS# 3-07;

Section Fifteen: Regulatory Information

TSCA: The product listed on this Material Safety Data Sheet is not listed on the Toxic Substances Control Act Inventory. All ingredients used to manufacture this product are listed on the TSCA Inventory

Section Sixteen: Other Information

HMIS Code	
Health	1
Flammability	3
Reactivity	0
Personal Protection	N/A

0=Minimal / 4 = Severe

Sanford has been advised by Counsel that the OSHA Hazard Communication Standard does not apply to the Sanford Product described in this Material Safety Data Sheet. The reason for the exemption is contained in 29 CFR 1910.1200(b)(6)(ix) as amended July 1, 2006 per the Code of Federal Regulations. The information contained in this MSDS is forwarded to you for your information, but is not meant to imply that the product is covered by the Hazard Communication Standard nor is this MSDS meant to comply with all requirements of the Hazard Communication Standard.

Paint Thinner

SECTION 1. IDENTIFICATION

Product Identifier	Paint Thinner
Other Means of Identification	13-311QC, 13-314QC, 13-318QC, 23-318-1000, 23-319QC, 33-311RONA, 33-314BMR, 33-314RONA
Recommended Use	Please refer to Product label.
Restrictions on Use	None known.
Manufacturer / Supplier	Recochem Inc., 850 Montee de Liesse, Montreal, QC, H4T 1P4, Compliance and Regulatory Department, 905-878-5544, www.recochem.com
Emergency Phone No.	CANUTEC, 613-996-6666, 24 Hours
SDS No.	1612

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquid - Category 3; Acute toxicity (Inhalation) - Category 3; Skin corrosion/irritation - Category 2; Serious eye damage/eye irritation - Category 2A; Germ cell mutagenicity - Category 1B; Carcinogenicity - Category 1B; Specific target organ toxicity (single exposure) - Category 3; Aspiration hazard - Category 1; Aquatic hazard (Chronic) - Category 2

GHS Label Elements

Signal Word:
Danger

Hazard Statement(s):

H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H350	May cause cancer.
H411	Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

Prevention:

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat, sparks, open flames, and hot surfaces. – No smoking.

P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical, ventilating, lighting, and other equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P261 Avoid breathing fume, mist, vapours, spray.
P264 Wash hands and skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.
P280 Wear protective gloves/eye protection/face protection.

Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTRE/doctor.
P331 Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P312 Call a POISON CENTRE/doctor if you feel unwell.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P332 + P313 If skin irritation occurs: Get medical advice/attention.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312 Call a POISON CENTRE/doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312 Call a POISON CENTRE/doctor if you feel unwell.
P337 + P313 If eye irritation persists: Get medical advice/attention.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P370 + P378 In case of fire: Use appropriate foam, carbon dioxide, water spray or fog, dry chemical powder to extinguish.
P391 Collect spillage.

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

Disposal:
Dispose of contents/container in accordance with applicable regional, national and local laws and regulations.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture:

Chemical Name	CAS No.	%	Other Identifiers
Hydrotreated kerosene	64742-47-8	60-100	
Stoddard solvent	8052-41-3	15-40	
n-Nonane	111-84-2	1-5	
1,2,4-Trimethylbenzene	95-63-6	1-5	
Naphthalene	91-20-3	0.1-1	

Notes

The specific chemical identity and/or exact percentage of composition (concentration) has been withheld as a trade secret.

SECTION 4. FIRST-AID MEASURES

First-aid Measures

Inhalation

Take precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). Remove source of exposure or move to fresh air. Keep at rest in a position comfortable for breathing. Call a Poison Centre or doctor if you feel unwell or are concerned.

Skin Contact

Avoid direct contact. Wear chemical protective clothing if necessary. Take off contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Wash gently and thoroughly with lukewarm, gently flowing water and mild soap for 5 minutes. Call a Poison Centre or doctor if you feel unwell or are concerned. If skin irritation occurs get medical advice/attention. Thoroughly clean clothing, shoes and leather goods before reuse or dispose of safely.

Eye Contact

Avoid direct contact. Wear chemical protective gloves if necessary. Quickly and gently blot or brush chemical off the face. Immediately rinse the contaminated eye(s) with lukewarm, gently flowing water for 15-20 minutes, while holding the eyelid(s) open. Remove contact lenses, if present and easy to do. Take care not to rinse contaminated water into the unaffected eye or onto the face. If eye irritation persists, get medical advice/attention.

Ingestion

Do not induce vomiting. Rinse mouth with water. Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Do not induce vomiting. If vomiting occurs naturally, lie on your side in the recovery position. Rinse mouth with water again. If breathing has stopped, trained personnel should immediately begin rescue breathing. Immediately call a Poison Centre or doctor.

Most Important Symptoms and Effects, Acute and Delayed

No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Immediate Medical Attention and Special Treatment

Target Organs

Eyes, skin, respiratory system.

Special Instructions

No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Medical Conditions Aggravated by Exposure

Dermatitis.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Carbon dioxide, dry chemical powder, appropriate foam, water spray or fog.

Unsuitable Extinguishing Media

None known.

Specific Hazards Arising from the Chemical

Flammable liquid and vapour. Can ignite at room temperature. Releases vapour that can form explosive mixture with air. Can be ignited by static discharge. Can accumulate static charge by flow, splashing or agitation. Liquid can float on water and may travel to distant locations and/or spread fire. See Section 9 (Physical and Chemical Properties) for flash point and explosive limits. Closed containers may rupture violently when heated releasing contents.
In a fire, the following hazardous materials may be generated: irritating chemicals; toxic chemicals; very toxic carbon monoxide, carbon dioxide.

Special Protective Equipment and Precautions for Fire-fighters

Review Section 6 (Accidental Release Measures) for important information on responding to leaks/spills.
See Skin Protection in Section 8 (Exposure Controls/Personal Protection) for advice on suitable chemical protective materials.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures

No special precautions are necessary. Evacuate downwind locations. Use the personal protective equipment recommended in Section 8 of this safety data sheet. Increase ventilation to area or move leaking container to a well-ventilated and secure area. Eliminate all ignition sources. Use grounded, explosion-proof equipment.

Environmental Precautions

Do not allow into any sewer, on the ground or into any waterway.

Methods and Materials for Containment and Cleaning Up

Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. 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 (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling

Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Conditions for Safe Storage

Store in accordance with local regulations. Store in a segregated and approved area. 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. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

	ACGIH TLV®		OSHA PEL		AIHA WEEL	
Chemical Name	TWA	STEL	TWA	Ceiling	8-hr TWA	TWA
Stoddard solvent	100 ppm	Not established	100 ppm	Not established		
Naphthalene	10 ppm A3	Not established	10 ppm	15 ppm		
n-Nonane	200 ppm	Not established	200 ppm	Not established		
1,2,4-Trimethylbenzene	25 ppm	Not established	25 ppm	Not established		
Hydrotreated kerosene	200 mg/m3 A3	Not established	Not established	Not established		

Appropriate Engineering Controls

General ventilation is usually adequate. For large scale use of this product: use local exhaust ventilation, if general ventilation is not adequate to control amount in the air. Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored. Control static electricity discharges which includes bonding of equipment to ground. Use only non-combustible, compatible materials for walls, floors, ventilation system, air cleaning devices, pallets, shelving. Provide eyewash and safety shower if contact or splash hazard exists.

Individual Protection Measures

Eye/Face Protection

Wear chemical safety goggles.

Skin Protection

Wear chemical protective clothing e.g. gloves, aprons, boots.

Respiratory Protection

Not normally required if product is used as directed. For non-routine or emergency situations: wear a NIOSH approved air-purifying respirator with an appropriate cartridge.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Basic Physical and Chemical Properties

Appearance	Clear liquid.
Odour	Hydrocarbon
Odour Threshold	Not available
pH	Not available
Melting Point/Freezing Point	-77 ºC (-107 ºF) (melting); -77 ºC (-107 ºF) (freezing)
Initial Boiling Point/Range	159 - 195 ºC (318 - 383 ºF)
Flash Point	42 ºC (108 ºF) (closed cup)
Evaporation Rate	0.19 (n-butyl acetate = 1)
Flammability (solid, gas)	Not applicable
Upper/Lower Flammability or Explosive Limit	5.6% (upper); 0.8% (lower)
Vapour Pressure	1.965 mm Hg (0.262 kPa) at 20 ºC
Vapour Density (air = 1)	4.9
Relative Density (water = 1)	0.779 at 15 ºC
Solubility	Insoluble in water; Not available (in other liquids)
Partition Coefficient, n-Octanol/Water (Log Kow)	Not available
Auto-ignition Temperature	260 ºC (500 ºF)
Decomposition Temperature	Not available
Viscosity	1.27 centistokes at 25 ºC (kinematic); Not available (dynamic)

Other Information

Physical State	Liquid
Molecular Weight	Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity

None known.

Chemical Stability

Normally stable.

Possibility of Hazardous Reactions

None known.

Conditions to Avoid

Open flames, sparks, static discharge, heat and other ignition sources. Temperatures above 43.0 ºC (109.4 ºF)

Incompatible Materials

Reacts explosively with: strong oxidizing agents (e.g. perchloric acid).
Not corrosive to metals.

Hazardous Decomposition Products

None known.

SECTION 11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure

Skin contact; eye contact; inhalation.

Acute Toxicity

Chemical Name	LC50	LD50 (oral)	LD50 (dermal)
Stoddard solvent	> 5500 mg/m3 (rat) (4-hour exposure)	5000 mg/kg (rat)	> 3000 mg/kg (rabbit)
Naphthalene	739.2 mg/m3 (rat) (4-hour exposure)	316 mg/kg (mouse)	> 20000 mg/kg (rabbit)
n-Nonane	3200 ppm (rat) (4-hour exposure)	15 g/kg (rat)	Not available
1,2,4-Trimethylbenzene	18000 mg/m3 (rat)	5000 mg/kg (rat)	Not available
Hydrotreated kerosene	> 5 mg/L (rat) (4-hour exposure)	> 5000 mg/kg (rat)	> 2000 mg/kg (rabbit)

LC50: Not applicable.

LD50 (oral): Not applicable.

LD50 (dermal): Not applicable.

Skin Corrosion/Irritation

Animal tests show moderate or severe irritation.

Serious Eye Damage/Irritation

Human experience shows mild irritation. The vapour also irritates the eyes.

STOT (Specific Target Organ Toxicity) - Single Exposure

Inhalation

May cause depression of the central nervous system. Symptoms may include headache, nausea, dizziness, drowsiness and confusion. Nose and throat irritation. At high concentrations.

Skin Absorption

No information was located.

Ingestion

Not harmful based on animal tests.

Aspiration Hazard

Can cause lung damage if aspirated based on human experience. Death can result.

STOT (Specific Target Organ Toxicity) - Repeated Exposure

Causes damage to organs based on studies in people. If inhaled: effects similar to STOT (Specific Target Organ Toxicity) - Single Exposure, as described above, effects on the central nervous system, "organic solvent syndrome". Causes Following skin contact: dermatitis. Symptoms may include dry, red, cracked skin (dermatitis). effects similar to STOT (Specific Target Organ Toxicity) - Single Exposure, as described above.
May cause damage to organs based on limited evidence. If inhaled and/or following skin contact: at high concentrations harmful effects on the kidneys, harmful effects on the liver.
May cause damage to organs based on limited evidence. If inhaled and/or following skin contact: blood tests may show

abnormal results.

Respiratory and/or Skin Sensitization

No information was located. No information was located.

Carcinogenicity

Chemical Name	IARC	ACGIH®	NTP	OSHA
Stoddard solvent	Group 3	Not designated	Not Listed	Not Listed
Naphthalene	Group 2B	A3	Reasonably anticipated	Not Listed
n-Nonane	Not Listed	Not designated	Not Listed	Not Listed
1,2,4-Trimethylbenzene	Not Listed	Not designated	Not Listed	Not Listed
Hydrotreated kerosene	Group 3	A3	Not Listed	Listed

Reproductive Toxicity

Development of Offspring

Conclusions cannot be drawn from the limited studies available.

Sexual Function and Fertility

No information was located.

Effects on or via Lactation

No information was located.

Germ Cell Mutagenicity

May be mutagenic based on limited evidence. (Stoddard solvent)

Interactive Effects

No information was located.

SECTION 12. ECOLOGICAL INFORMATION

Toxicity

Acute Aquatic Toxicity

Chemical Name	LC50 Fish	EC50 Crustacea	ErC50 Aquatic Plants	ErC50 Algae
Stoddard solvent	Not available	Not available		
Naphthalene	0.9-9.8 mg/L (Oncorhynchus mykiss (rainbow trout); 96-hour; fresh water)	Not available		
n-Nonane	Not available	Not available		
1,2,4-Trimethylbenzene	7.72 mg/L (Pimephales promelas (fathead minnow); 96-hour)	Not available		
Hydrotreated kerosene	2.2 mg/L (Lepomis macrochirus (bluegill); 96-hour)	Not available		

Chronic Aquatic Toxicity

Chemical Name	NOEC Fish	EC50 Fish	NOEC Crustacea	EC50 Crustacea
Stoddard solvent	Not available		Not available	
Naphthalene	1.8 mg/L		Not available	

	(Oncorhynchus mykiss (rainbow trout); 3 days; fresh water)			
n-Nonane	Not available		Not available	
1,2,4-Trimethylbenzene	Not available		Not available	
Hydrotreated kerosene	Not available		Not available	

Persistence and Degradability

No information was located.

Bioaccumulative Potential

No information was located.

Mobility in Soil

No information was located.

Other Adverse Effects

There is no information available.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal Methods

The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. 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. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14. TRANSPORT INFORMATION

Regulation	UN No.	Proper Shipping Name	Transport Hazard Class(es)	Packing Group
Canadian TDG	1268	PETROLEUM DISTILLATES	3	III
US DOT	1268	PETROLEUM DISTILLATES	3	III

Environmental Hazards: Potential Marine Pollutant (1,2,4-Trimethylbenzene)

Special Precautions for User: Please note: In containers of 450 L or less this product is not classified as a Dangerous Good according to TDG Exemption 1.33
In containers of 450L of less, this product meets the requirements of DOT exemption as per 49 CFR, section 173.150 (f).

Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15. REGULATORY INFORMATION

Safety, Health and Environmental Regulations

Canada

Domestic Substances List (DSL) / Non-Domestic Substances List (NDSL)

All ingredients are listed on the DSL/NDSL.

USA

Toxic Substances Control Act (TSCA) Section 8(b)

All ingredients are listed on the TSCA Inventory.

Additional USA Regulatory Lists

California Proposition 65: WARNING: This product contains chemicals known to the State of California to cause cancer.

SECTION 16. OTHER INFORMATION

SDS Prepared By	Compliance and Regulatory Department
Phone No.	905-878-5544
Date of Preparation	November 16, 2015
Additional Information	We are committed to uphold the Industry Consumer Ingredient Communication Voluntary Initiative. Please send us your request by visiting our website at www.recochem.com. Ingredients present (intentionally added ingredients) at a concentration of greater than one percent (1%) shall be listed in descending order of predominance. Ingredients present at a concentration of not more than one percent shall be listed but may be disclosed without respect to order of predominance.
Disclaimer	Notice to reader: To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Fisher Scientific

Part of Thermo Fisher Scientific

SAFETY DATA SHEET

Creation Date 19-Nov-2010 **Revision Date** 03-Jul-2014 **Revision Number** 1

1. Identification

Product Name **Sodium cyanide**

Cat No. : **S284I-100, S284I-500**

Synonyms Hydrocyanic acid, sodium salt; Prussiate of soda; Cyanide of sodium

Recommended Use Laboratory chemicals.

Uses advised against No Information available

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Acute oral toxicity	Category 1
Acute dermal toxicity	Category 1
Acute Inhalation Toxicity - Dusts and Mists	Category 1
Specific target organ toxicity (single exposure)	Category 1
Target Organs - Respiratory system, Central nervous system (CNS).	
Specific target organ toxicity - (repeated exposure)	Category 1
Target Organs - Blood.	

Label Elements

Signal Word
Danger

Hazard Statements
May be corrosive to metals

Fatal if swallowed
Fatal in contact with skin
Fatal if inhaled
May cause respiratory irritation
May cause drowsiness or dizziness
Causes damage to organs
Causes damage to organs through prolonged or repeated exposure

Precautionary Statements
Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Do not get in eyes, on skin, or on clothing
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear respiratory protection
Keep only in original container
Response
IF exposed: Call a POISON CENTER or doctor/physician
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Immediately call a POISON CENTER or doctor/physician
Call a POISON CENTER or doctor/physician if you feel unwell
Skin
Immediately call a POISON CENTER or doctor/physician
IF ON SKIN: Gently wash with plenty of soap and water
Remove/Take off immediately all contaminated clothing
Wash contaminated clothing before reuse
Ingestion
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Rinse mouth
Spills
Absorb spillage to prevent material damage
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Store in corrosive resistant polypropylene container with a resistant inliner
Store in a dry place
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Very toxic to aquatic life with long lasting effects
Contact with acids liberates very toxic gas
Other hazards
WARNING! This product contains a chemical known in the State of California to cause cancer.

3. Composition / information on ingredients

Component	CAS-No	Weight %
Sodium cyanide	143-33-9	>95

4. First-aid measures

General Advice Immediately call a POISON CENTER or doctor/physician. Show this safety data sheet to the doctor in attendance. Take off contaminated clothing and shoes immediately.

Eye Contact Immediate medical attention is required. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Skin Contact Immediate medical attention is required. Wash off immediately with plenty of water for at least 15 minutes.

Inhalation Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Immediate medical attention is required.

Ingestion Do not induce vomiting. Call a physician or Poison Control Center immediately.

Most important symptoms/effects Breathing difficulties. Systemic Toxicity: Respiratory disorders: Symptoms may include tightness in the chest, flushing, headache, nausea, vomiting, respiratory depression, weakness, irregular heartbeat, abdominal pain, convulsions, and shock: May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood): Exposure may result in death

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Substance is nonflammable; use agent most appropriate to extinguish surrounding fire. Dry powder.

Unsuitable Extinguishing Media No information available

Flash Point No information available
Method - No information available

Autoignition Temperature Not applicable
Explosion Limits
Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
Non-combustible. Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous Combustion Products
Nitrogen oxides (NOx) Hydrogen cyanide (hydrocyanic acid)
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
4	0	0	N/A

6. Accidental release measures

Personal Precautions Evacuate personnel to safe areas. Ensure adequate ventilation. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Do not touch or walk through spilled material. If spilled, take caution, as material can cause surfaces to become very slippery.

Environmental Precautions Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained. See Section 12 for additional ecological information. Avoid release to the environment. Collect spillage.

Methods for Containment and Clean Up Provide adequate ventilation. Avoid dust formation. Sweep up or vacuum up spillage and collect in suitable container for disposal. Do not expose spill to water.

7. Handling and storage

Handling Use only under a chemical fume hood. Wear personal protective equipment. Do not breathe dust. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Handle in accordance with good industrial hygiene and safety practice. Keep container tightly closed.

Storage Keep in a dry, cool and well-ventilated place. Keep container tightly closed. Keep locked-up. Keep away from acids. Keep away from combustible material. Do not store in aluminum containers.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sodium cyanide	Ceiling: 5 mg/m³ Skin	(Vacated) TWA: 5 mg/m³	IDLH: 25 mg/m³ Ceiling: 4.7 ppm Ceiling: 5 mg/m³

Component	Quebec	Mexico OEL (TWA)	Ontario TWAEV
Sodium cyanide	Ceiling: 10 ppm Ceiling: 11 mg/m³ Skin	TWA: 5 mg/m³ Ceiling: 5 mg/m³	CEV: 5 mg/m³ Skin

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Solid
Appearance	White
Odor	bitter almond
Odor Threshold	No information available
pH	11-12 20 g/l aq. sol
Melting Point/Range	562 °C / 1043.6 °F
Boiling Point/Range	1497 °C / 2726.6 °F
Flash Point	No information available
Evaporation Rate	Not applicable
Flammability (solid,gas)	No information available

Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	1 hPa @ 817 °C
Vapor Density	Not applicable
Relative Density	1.6000
Bulk Density	750 - 950 kg/m^3
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	Not applicable
Decomposition temperature	No information available
Viscosity	Not applicable
Molecular Formula	C N Na
Molecular Weight	49

10. Stability and reactivity

Reactive Hazard Yes

Stability Stable under normal conditions. Hygroscopic.

Conditions to Avoid Incompatible products. Exposure to moist air or water.

Incompatible Materials Acids, Strong oxidizing agents, Carbon dioxide (CO2), Metals

Hazardous Decomposition Products Nitrogen oxides (NOx), Hydrogen cyanide (hydrocyanic acid)

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

Toxicologically Synergistic Products No information available

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

Irritation No information available

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Sodium cyanide	143-33-9	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects Not mutagenic in AMES Test

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Respiratory system Central nervous system (CNS)

STOT - repeated exposure Blood

Aspiration hazard No information available

Symptoms / effects, both acute and delayed Systemic Toxicity: Respiratory disorders: Symptoms may include tightness in the chest, flushing, headache, nausea, vomiting, respiratory depression, weakness, irregular heartbeat, abdominal pain, convulsions, and shock: May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood): Exposure may result in death

Endocrine Disruptor Information No information available

Component	EU - Endocrine Disrupters Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Japan - Endocrine Disruptor Information
Sodium cyanide	Group III Chemical	Not applicable	Not applicable

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Sodium cyanide	Not listed	0.17 mg/L LC50 96 h 0.0712 - 0.0936 mg/L LC50 96 h 0.0558 - 0.0586 mg/L LC50 96 h 0.0391 - 0.0548 mg/L LC50 96 h 0.15 mg/L LC50 96 h 0.066 - 0.0852 mg/L LC50 96 h	Not listed	0.17 mg/L EC50 = 96 h

Persistence and Degradability Soluble in water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its water solubility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Sodium cyanide - 143-33-9	-	not otherwise specified

14. Transport information

DOT

- **UN-No** UN1689
- **Proper Shipping Name** SODIUM CYANIDE, SOLID
- **Hazard Class** 6.1
- **Packing Group** I

TDG

- **UN-No** UN1689
- **Proper Shipping Name** SODIUM CYANIDE, SOLID
- **Hazard Class** 6.1
- **Packing Group** I

IATA

- **UN-No** 1689
- **Proper Shipping Name** SODIUM CYANIDE, SOLID
- **Hazard Class** 6.1
- **Packing Group** I

IMDG/IMO

- **UN-No** 1689

Proper Shipping Name	SODIUM CYANIDE, SOLID
Hazard Class	6.1
Packing Group	I

15. Regulatory information

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Sodium cyanide	X	X	-	205-599-4	-		X	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Sodium cyanide	143-33-9	>95	1.0

SARA 311/312 Hazardous Categorization

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	Yes

Clean Water Act

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Sodium cyanide	X	10 lb	X	X

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Sodium cyanide	X		-

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Sodium cyanide	10 lb	10 lb

California Proposition 65 This product contains the following Proposition 65 chemicals:

Component	CAS-No	California Prop. 65	Prop 65 NSRL	Category
Sodium cyanide	143-33-9	Carcinogen Male Reproductive	-	Carcinogen

State Right-to-Know

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Sodium cyanide	X	X	X	X	X

U.S. Department of Transportation

Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product contains the following DHS chemicals:

Component	DHS Chemical Facility Anti-Terrorism Standard
Sodium cyanide	2000 lb STQ

Other International Regulations

Mexico - Grade No information available

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR

WHMIS Hazard Class
D1A Very toxic materials
E Corrosive material
D2A Very toxic materials
F Dangerously reactive material

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 19-Nov-2010
Revision Date 03-Jul-2014
Print Date 03-Jul-2014
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

Disclaimer
The information provided on 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 guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as 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 material or in any process, unless specified in the text.

End of SDS

SAFETY DATA SHEET

Creation Date 16-Jun-2009 **Revision Date** 07-Aug-2015 **Revision Number** 2

1. Identification

Product Name **Sodium hydroxide**

Cat No. : **AC206060000; AC206060010; AC206060025; AC206060250; AC206060100**

Synonyms Caustic soda

Recommended Use Laboratory chemicals.

Uses advised against No Information available

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Entity / Business Name
Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Skin Corrosion/irritation	Category 1 A
Serious Eye Damage/Eye Irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

Label Elements

Signal Word
Danger

Hazard Statements
May be corrosive to metals
Causes severe skin burns and eye damage
May cause respiratory irritation

Precautionary Statements
Prevention
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area
Keep only in original container
Response
Immediately call a POISON CENTER or doctor/physician
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Skin
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Ingestion
IF SWALLOWED: Rinse mouth. DO NOT induce vomiting
Spills
Absorb spillage to prevent material damage
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Store in corrosive resistant polypropylene container with a resistant inliner
Store in a dry place
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
None identified

3. Composition / information on ingredients

Component	CAS-No	Weight %
Sodium hydroxide	1310-73-2	100

4. First-aid measures

General Advice Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required. Keep eye wide open while rinsing.

Skin Contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Call a physician immediately.

Inhalation Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Call a physician or Poison Control Center immediately.

Ingestion Do not induce vomiting. Immediate medical attention is required. Never give anything by mouth to an unconscious person. Drink plenty of water.

Most important symptoms/effects Causes burns by all exposure routes. . Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media CO_2, dry chemical, dry sand, alcohol-resistant foam.

Unsuitable Extinguishing Media Carbon dioxide (CO2), Water

Flash Point No information available
Method - No information available

Autoignition Temperature
Explosion Limits
Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
The product causes burns of eyes, skin and mucous membranes.

Hazardous Combustion Products
Sodium oxides Hydrogen
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA

Health	Flammability	Instability	Physical hazards
3	0	1	N/A

6. Accidental release measures

Personal Precautions Use personal protective equipment. Evacuate personnel to safe areas. Avoid contact with skin, eyes and clothing.

Environmental Precautions Do not allow material to contaminate ground water system. Should not be released into the environment. Do not flush into surface water or sanitary sewer system. See Section 12 for additional ecological information.

Methods for Containment and Clean Up Avoid dust formation. Sweep up or vacuum up spillage and collect in suitable container for disposal.

7. Handling and storage

Handling Wear personal protective equipment. Use only under a chemical fume hood. Do not get in eyes, on skin, or on clothing. Do not breathe dust. Do not ingest.

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sodium hydroxide	Ceiling: 2 mg/m³	(Vacated) Ceiling: 2 mg/m³ TWA: 2 mg/m³	IDLH: 10 mg/m³ Ceiling: 2 mg/m³

Component	Quebec	Mexico OEL (TWA)	Ontario TWAEV
Sodium hydroxide	Ceiling: 2 mg/m³	Ceiling: 2 mg/m³	CEV: 2 mg/m³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Tightly fitting safety goggles. Face-shield.

Skin and body protection Long sleeved clothing.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Solid
Appearance	White
Odor	Odorless
Odor Threshold	No information available
pH	14 (5 %)
Melting Point/Range	318 °C / 604.4 °F
Boiling Point/Range	1390 °C / 2534 °F @ 760 mmHg
Flash Point	No information available
Evaporation Rate	Not applicable
Flammability (solid,gas)	Not flammable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	1 mbar @ 700 °C
Vapor Density	Not applicable
Specific Gravity	No information available
Bulk Density	2.13 g/cm3
Solubility	Soluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	
Decomposition Temperature	No information available
Viscosity	Not applicable
Molecular Formula	H Na O
Molecular Weight	40

10. Stability and reactivity

Reactive Hazard Yes

Stability Stable under normal conditions.

Conditions to Avoid Incompatible products. Excess heat.

Incompatible Materials Strong oxidizing agents, Acids, Metals, Water,

Hazardous Decomposition Products Sodium oxides, Hydrogen

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information No acute toxicity information is available for this product

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sodium hydroxide	Not listed	1350 mg/kg (Rabbit)	Not listed

Toxicologically Synergistic Products No information available

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

Irritation Causes severe burns by all exposure routes

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Sodium hydroxide	1310-73-2	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects Mutagenic effects have occurred in experimental animals.

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Respiratory system

STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

Endocrine Disruptor Information No information available

Other Adverse Effects See actual entry in RTECS for complete information.

12. Ecological information

Ecotoxicity

Do not empty into drains. Contains a substance which is:. Harmful to aquatic organisms. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Sodium hydroxide	Not listed	45.4 mg/L LC50 96 h	Not listed	Not listed

Persistence and Degradability Soluble in water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its water solubility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No	UN1823
Proper Shipping Name	SODIUM HYDROXIDE, SOLID
Hazard Class	8
Packing Group	II

TDG

UN-No	UN1823
Proper Shipping Name	SODIUM HYDROXIDE, SOLID
Hazard Class	8
Packing Group	II

IATA

UN-No	UN1823
Proper Shipping Name	Sodium hydroxide, solid
Hazard Class	8
Packing Group	II

IMDG/IMO

UN-No	UN1823
Proper Shipping Name	Sodium hydroxide, solid
Hazard Class	8
Packing Group	II

15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Sodium hydroxide	X	X	-	215-185-5	-		X	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313 Not applicable

SARA 311/312 Hazardous Categorization

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	Yes

Clean Water Act

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants

Sodium hydroxide	X	1000 lb	-	-

Clean Air Act Not applicable

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Sodium hydroxide	1000 lb	-

California Proposition 65 This product does not contain any Proposition 65 chemicals

State Right-to-Know

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Sodium hydroxide	X	X	X	-	X

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR

WHMIS Hazard Class E Corrosive material
D2B Toxic materials

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 16-Jun-2009
Revision Date 07-Aug-2015
Print Date 07-Aug-2015
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

Disclaimer
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date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as 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 material or in any process, unless specified in the text.

End of SDS

Material Safety Data Sheet

LA1638
Sodium Metabisulphite

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Id: LA1638
Product Name: Sodium Metabisulphite
Synonyms: Anhydrous sodium bisulfite, ABS, sodium pyrosulfite.
Chemical Family: None Known
Application: Bleaching and disinfectant agent in textile, laundering, paper and fermentation industries. Water treatment. Photographical agent. Chemical processing. Drug manufacturing. Food additive. Only NF grade is for use in drug formulation. Only Food Grade (FG) material is for use as a food additive.

Distributed By:
Univar Canada Ltd.
9800 Van Horne Way
Richmond, BC
V6X 1W5

Prepared By: The Environment, Health and Safety Department of Univar Canada Ltd.
Preparation date of MSDS: 04/Feb/2016
Telephone number of preparer: 1-866-686-4827

24-Hour Emergency Telephone Number (CANUTEC): (613) 996-6666

2. HAZARDS IDENTIFICATION

Potential Acute Health Effects:
Eye Contact: Dust or mist may irritate or burn eyes. Solutions can cause severe eye irritation with tearing, redness, or a stinging or burning feeling. May cause permanent eye damage.
Skin Contact: Repeated or prolonged contact may cause irritation. Solutions are more irritating and may cause burns if not removed from skin promptly.
Inhalation: Contact with acids liberates irritating and potentially fatal sulphur dioxide gas. May cause severe or deadly allergic reactions in some asthmatics and sulfite sensitive individuals. May cause irritation of the respiratory tract. Possible signs and symptoms of allergic reaction include bronchoconstriction, sweating, flushing, hives, rapid heart rate, decreased blood pressure and anaphylaxis.
Ingestion: May result in irritation of the mouth and gastrointestinal tract. Large doses may cause violent colic and diarrhea, circulatory disturbances, central nervous system depression. Sulfite sensitive individuals may experience an allergic reaction with nausea, diarrhea, itching, swelling, hives, acute asthma attack, loss of consciousness or anaphylactic shock.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients	Percentage (W/W)	LD50s and LC50s Route & Species:
Sodium Metabisulfite 7681-57-4	60-100	Oral LD50 Rat = 1131 mg/kg

Note: Remainder of the ingredients are non-hazardous.

4. FIRST AID MEASURES

Eye Contact: In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing. Remove contact lenses, if present, after the first five minutes, then continue rinsing. Seek immediate medical attention.
Skin Contact: Flush with large amounts of soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if irritation persists.
Inhalation: Move person to fresh air. If irritation persists, seek medical attention.
Ingestion: If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Seek medical attention immediately.
Notes to Physician: Treatment based on sound judgment of physician and individual reactions of patient.Note potential for anaphylactic shock with allergic individuals.

5. FIRE FIGHTING MEASURES

Flash Point: None.
Flash Point Method: Not applicable.
Autoignition Temperature: Not available.
Flammable Limits in Air (%): Not Available.
Extinguishing Media: Use extinguishing media appropriate for surrounding fire.
Special Exposure Hazards: Emits toxic fumes under fire conditions.
Hazardous Decomposition/Combustion Materials (under fire conditions): Toxic fumes. Sulphur dioxide.
Special Protective Equipment: Fire fighters should wear full protective clothing, including self-contained breathing equipment.
NFPA RATINGS FOR THIS PRODUCT ARE: Not Available.
HMIS RATINGS FOR THIS PRODUCT ARE: Not Available.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures: Wear appropriate protective equipment. Ventilate spill area if possible.
Environmental Precautionary Measures: Prevent entry into sewers or streams, dike if needed.
Procedure for Clean Up: Ventilate area. Pick up solids and put in an appropriate sealed container for later disposal. Cautiously spray residue with plenty of water.

7. HANDLING AND STORAGE

Handling: Avoid contact with eyes, skin and clothing. Avoid breathing in dust. Wash thoroughly after handling. For Food Grade product see following precautions regarding on-board use in preserving shrimp and fish.
On-board ship use of Food Grade material to preserve shrimp and fish:
NEVER apply dry material to shrimp or fish.
ALWAYS prepare and use a solution in a well-ventilation area.
NEVER use below deck or in any confined space such as a hold or cooler. Injury or death may occur. ALWAYS use on deck with plenty of ventilation. Follow mixing and use directions printed on bag.
Storage: Store in a cool, dry, well ventilated area, away from heat and ignition sources. Protect against moisture, water and physical damage. Dry to avoid tendency of product to cake.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:

Localized ventilation should be used to control dust levels. Use in a well ventilated area. Do not use in unventilated spaces, e.g. the holds of fishing boats, walk-in coolers or confined spaces.
Respiratory Protection: For dusty or misty conditions, wear NIOSH-approved dust or mist respirator. Use self-contained breathing apparatus in high vapor concentrations.
Gloves:

Impervious gloves.
Skin Protection: For handling dry material, wear cotton gloves and full work clothing, including long-sleeved shirt and trousers. When handling solutions, wear impervious gloves and an apron. Impervious boots.
Eyes: Safety glasses (with side shields). Do NOT wear contact lenses.
Other Personal Protection Data: Ensure that eyewash stations and safety showers are proximal to the work-station location.

Ingredients	Exposure Limit - ACGIH	Exposure Limit - OSHA	Immediately Dangerous to Life or Health - IDLH
Sodium Metabisulfite	5 mg/m^3 TLV-TWA	5 mg/m^3 TWA	Not Available.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid Fine Granular
Color: White
Odor: Pungent Sulphur dioxide.
pH 4.3 (1% solution)
Specific Gravity: 1.48
Boiling Point: Not Available.
Freezing/Melting Point: Decomposes at >150°C
Vapor Pressure: Not Available.
Vapor Density: Not Available.
% Volatile by Volume: Not Available.
Evaporation Rate: Not Available.
Solubility: 39% @ 16°C
VOCs: Not Available.
Viscosity: Not Available.
Molecular Weight: 190.11
Other: Not Available.

10. STABILITY AND REACTIVITY

Chemical Stability: Stable.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Temperatures above 150°C. Cause evolution of toxic and corrosive gas - sulphur dioxide. Heat.
Materials to Avoid: Oxidizing agents. Acids. Water.
Hazardous Decomposition Products: Sulphur dioxide. Sodium sulfide residue.
Additional Information:

Oxidizers may cause strong exothermic reactions. Acids, water and ice yield sulfur dioxide gas, which is toxic and corrosive and potentially deadly.

11. TOXICOLOGICAL INFORMATION

Principle Routes of Exposure

Ingestion: May result in irritation of the mouth and gastrointestinal tract. Large doses may cause violent colic and diarrhea, circulatory disturbances, central nervous system depression. Sulfite sensitive individuals may experience an allergic reaction with nausea, diarrhea, itching, swelling, hives, acute asthma attack, loss of consciousness or anaphylactic shock.
Skin Contact: Repeated or prolonged contact may cause irritation. Solutions are more irritating and may cause burns if not removed from skin promptly.

11. TOXICOLOGICAL INFORMATION

Inhalation: Contact with acids liberates irritating and potentially fatal sulphur dioxide gas. May cause severe or deadly allergic reactions in some asthmatics and sulfite sensitive individuals. May cause irritation of the respiratory tract. Possible signs and symptoms of allergic reaction include bronchoconstriction, sweating, flushing, hives, rapid heart rate, decreased blood pressure and anaphylaxis.
Eye Contact: Dust or mist may irritate or burn eyes. Solutions can cause severe eye irritation with tearing, redness, or a stinging or burning feeling. May cause permanent eye damage.

Additional Information:
Acute Test of Product:
Acute Oral LD50: Not Available.
Acute Dermal LD50: Not Available.
Acute Inhalation LC50: Not Available.

Carcinogenicity:

Ingredients	IARC - Carcinogens	ACGIH - Carcinogens
Sodium Metabisulfite	Group 3	A4

Carcinogenicity Comment: No additional information available.

Reproductive Toxicity/ Teratogenicity/ Embryotoxicity/ Mutagenicity: Not Available.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

Ingredients	Ecotoxicity - Fish Species Data	Acute Crustaceans Toxicity:	Ecotoxicity - Freshwater Algae Data
Sodium Metabisulfite	32 mg/L LC50 (Lepomis macrochirus) 96 h static	Not Available.	40 mg/L EC50 Desmodesmus subspicatus 96 h 48 mg/L EC50 Desmodesmus subspicatus 72 h

Other Information:
No additional remark.

13. DISPOSAL CONSIDERATIONS

Disposal of Waste Method: Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations.
Contaminated Packaging: Empty containers should be recycled or disposed of through an approved waste management facility.

14. TRANSPORT INFORMATION

DOT (U.S.):
DOT Shipping Name: Not Regulated.
DOT Hazardous Class Not Applicable.
DOT UN Number: Not Applicable.
DOT Packing Group: Not Applicable.
DOT Reportable Quantity (lbs): Not Available.
Note: No additional remark.
Marine Pollutant: No.

TDG (Canada):
TDG Shipping Name: Not Regulated.
Hazard Class: Not Applicable.
UN Number: Not Applicable.
Packing Group: Not Applicable.

14. TRANSPORT INFORMATION

Note: No additional remark.
Marine Pollutant: No.

15. REGULATORY INFORMATION

U.S. TSCA Inventory Status: All components of this product are either on the Toxic Substances Control Act (TSCA) Inventory List or exempt.

Canadian DSL Inventory Status: All components of this product are either on the Domestic Substances List (DSL), the Non-Domestic Substances List (NDSL) or exempt.

U.S. Regulatory Rules

Ingredients	CERCLA/SARA - Section 302:	SARA (311, 312) Hazard Class:	CERCLA/SARA - Section 313:
Sodium Metabisulfite	Not Listed.	Not Listed.	Not Listed.

California Proposition 65: Not Listed.
MA Right to Know List: Listed.
New Jersey Right-to-Know List: Listed.
Pennsylvania Right to Know List: Listed.

Additional Notes: Not Available.

WHMIS Hazardous Class:
D2B TOXIC MATERIALS

16. OTHER INFORMATION

Additional Information: This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Disclaimer: NOTICE TO READER:
Univar, expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from your local Univar Sales Office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.

*****END OF MSDS*****

SAFETY DATA SHEET

SOLVENT

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Solvent

PRODUCT DESCRIPTION: Aliphatic hydrocarbon-Mineral Spirits

SUPPLIER: Commercial Oil Company
P (905) 560-3244
F (905) 560-2961
35 Burford Road
Hamilton, Ontario
L8E 3C6

Product and MSDS Information: 1-800-463-1976

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

The following components are defined in accordance with sub-paragraph 13(a) (i) to (iv) or paragraph 14(a) of the
Hazardous Products Act

Light distillate-Hydro treated	100%	CAS-64742-47-8	LD50: >5 g/kg oral rat >3 g/kg skin rabbit

SECTION 3. HAZARDS IDENTIFICATION

WHMIS: Class B, Division B: Combustible Liquids
PIN Number: UN 1268

Packing Group III

Primary TDG: Class 3.3

Signal word Warning
Hazard statement Combustible liquid. May cause an allergic skin reaction.

INHALATION: High vapour concentrations are irritating to the eyes, nose, throat and lungs; may cause headaches and dizziness; may be anesthetic and may cause other central nervous system effects. Avoid breathing vapours or mists.
EYE CONTACT: Slightly irritating but will not injure eye tissue.
SKIN CONTACT: Low Toxicity. Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).
INGESTION: Minimal Toxicity. Small amounts of this liquid drawn into the lungs from swallowing or vomiting may cause severe health effects (e.g. bronchopneumonia or pulmonary edema).

CHRONIC: Prolonged and repeated exposures of male rats to inhalation of light hydrocarbon vapours in the same boiling range as this material produced kidney disorders and/or damage. These effects were not observed in similar studies with female rats and male and female mice and in limited studies with other animal species and are believed to be unique to the male rat. A number of human studies have not shown clinical evidence of an association between light hydrocarbons exposure and disease. It is highly unlikely that the kidney effects observed in male rats have significant implications for humans exposed at or below the occupational exposure limits.
OCCUPATIONAL EXPOSURE LIMITS: ACGIH Recommends: For Trimethylbenzene, 25ppm (125mg/m3) Manufacturer recommends: 100 ppm based on composition

SECTION 4. FIRST AID MEASURES

INHALATION: In emergency situations use proper respiratory protection to immediately remove the affected victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.
EYE CONTACT: Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.
SKIN CONTACT: Flush with large amounts of water. Use soap if it is available. Remove severely contaminated clothing (including shoes) and launder before reuse. If irritation persists, seek medical attention.
INGESTION: If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention

SECTION 5. FIRE-FIGHTING MEASURES

Flashpoint and method: 42 deg C TCC
Auto ignition: 229 deg C **Flammable Limits:** 1.1 to 6 % by volume
GENERAL HAZARDS: Combustible Liquid; may form combustible mixtures at or above the flash point. Toxic gases will form upon combustion.
FIRE FIGHTING: Use water spray to cool fire exposed surfaces and to protect personnel. Shut off fuel to fire. Use foam, dry chemical or water spray to extinguish fire. Respiratory and eye protection required for fire fighting personnel. Avoid spraying water directly into storage containers due to danger of boil over. A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.
HAZARDOUS COMBUSTIBLE PRODUCTS: Fumes, smoke and carbon monoxide.

SECTION 6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills as required to appropriate Provincial and Federal authorities. In particular, immediate reporting is required for all spills that could reach any waterway, including wetlands and intermittent dry creeks.
LAND SPILL: Eliminate source of ignition. Keep public away. Prevent additional discharge of material; if possible do
so without hazard. Prevent spills from entering sewer watercourses or low areas. Contain spilled liquid with sand or earth. Recover by pumping or using a suitable absorbent. Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse affects of the spill.
WATER SPILL: Remove from surface by skimming or with suitable absorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in unconfined waters. Consult an expert on
disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all action necessary to prevent and
remedy the adverse affects of the spill.

PERSONAL PRECAUTIONS: See Section 8

SECTION 7. HANDLING AND STORAGE

HANDLING STORAGE AND SHIPPING: Keep containers closed. Handle and open containers with care. Store in a cool, well-ventilated place away from incompatible materials. Do not handle or store near an open flame, sources of heat, or sources of ignition.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

PERSONAL PROTECTION: The selection of personal protective equipment varies depending upon conditions of use. Where prolonged and/or repeated skin and eye contact is likely to occur, wear safety glasses with side shields, long sleeves, and chemical resistant gloves. Where eye contact is unlikely, but may occur as a result of short and/or periodic exposures, wear safety glasses with side shields. Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.
ENGINEERING CONTROLS: The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumed. Provide mechanical ventilation of confined spaces
SKIN PROTECTION: No special equipment required. However, good personal hygiene practices should always be followed.
EXPOSURE LIMITS: This product does not contain any components which have recognized exposure limits.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
Viscosity: 1.18 cST at 25°C
Vapour Pressure: 1.3 kPa at 38°C
Vapour Density (air=1): 4.9
Evaporation Rate: 0.11
Freezing/Melting Point: <-18°C
%Volatile: 100
Appearance: Clear, colourless liquid

SECTION 10. STABILITY AND REACTIVITY

STABILITY: This product is stable. Hazardous polymerization will not occur.
INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID: Strong oxidizing agents.
HAZARDOUS DECOMPOSITION: N/A.

SECTION 11. TOXICOLOGICAL DATA

ORAL TOXICITY
Low Toxicity
DERMAL TOXICITY
Low Toxicity
Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).
INHALATION TOXICITY
Negligible hazard at normal temperatures (up to 38 deg C). Elevated temperatures or mechanical action may form vapours, mists or fumes, which may be irritating to the eyes, nose, throat and lungs. Avoid breathing vapours or mists.
EYE IRRITATION
Slightly irritating but will not injure eye tissue
SKIN IRRITATION
Practically non-irritating. (Primary Irritation index: greater than 0.5 but less than 3). Based on testing of similar products and/or the components.

SECTION 12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS: Not established.

SECTION 13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: The product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

SECTION 14. TRANSPORT INFORMATION

PRODUCT LABEL ...Solvent
SHIPPING NAME..... Aliphatic hydrocarbon-Mineral Spirits

SECTION 15. REGULATORY INFORMATION

No information available.

SECTION 16. PREPARATION

USE: CLEANING AND DEGREASING

COMMERCIAL OIL COMPANY
Hamilton, Ontario

Date: Feb. 16, 2016
Prepared by: Operations

MATERIAL SAFETY DATA SHEET

SULPHUR

PRODUCT IDENTIFICATION

Chemical Name and Synonyms: Sulphur. Flowers of sulphur.
Chemical Family: Inorganic
Chemical Formula: S
Product Use: Laboratory reagent
Manufacturers Name and Address: Caledon Laboratories Ltd. 40 Armstrong Avenue Georgetown, Ontario L7G 4R9
Telephone No: (905) 877-0101
Fax No: (905) 877-6666
Emergency Telephone No: CANUTEC (613) 996-6666

HAZARDOUS INGREDIENTS OF MATERIALS

Ingredients, %, TLV Units, CAS No: Sulphur, > 99, (TWA) 10 mg/m³ total dust 5 mg/m³ (respirable dust) 10 ppm (H_2S), 7704-34-9

PHYSICAL DATA

Physical State: Solid
Odour and Appearance: Yellow-coloured powder, lumps or crystals. Odourless when pure, but may contain trace amounts of hydrogen sulphide and exude typical rotten egg odour.
Odour Threshold (ppm): Not applicable.
Vapour Pressure (mm Hg): < 0.0001 mm Hg at 20 °C
Vapour Density (Air = 1): Not applicable.
Evaporation Rate: Not available.
Boiling Point (degrees C): 444 °C
Melting Point (degrees C): 117 °C - 121 °C
pH: Not applicable.
Specific Gravity: 1.803 (liquid), 2.040-2.070
Coefficient of Water/Oil distribution: Not available.

SHIPPING DESCRIPTION

UN: 1350
T.D.G. Class: 4.1
Pkg. Group: III

REACTIVITY DATA

Incompatibility with other substances: Will form explosive mixture with oxidizing agents or carbon. Reacts violently with alkalis, chlorates, halogens, carbides, mineral acids. Extremely corrosive to metals when moist. At temperatures > 100 °C, may release hydrogen sulphide.
Reactivity: Avoid excessive heat, sparks, flames and all sources of igntion, all incompatible materials, moisture.

FIRE AND EXPLOSION DATA

Flammability: Combustible. Dust or vapour suspended in air ignites easily and can result in an explosion in confined areas. Flammable/toxic gases form at elevated temperatures.
Extinguishing Media: Dry chemical, CO_2, foam. Water spray or fog. Water or foam may cause frothing, which will blanket and smother the fire. Small fires may be smothered by covering with inert material such as earth, sand. Firefighters should wear self-contained breathing apparatus and protective clothing sufficient to prevent contact. Bunker gear will not be adequate.
Flash Point (Method Used): 207 °C (CC)
Autoignition Temperature: 190 °C (dust in air)
Upper Flammable Limit (% by volume): 1400 g/m³ (for dust)
Lower Flammable Limit (% by volume): 35 g/m³ (for dust)
Hazardous Combustion Products: H_2S, SOx
Sensitivity to Impact: None identified.

TOXICOLOGICAL PROPERTIES AND HEALTH DATA

Toxicological Data:
LD50: (oral, rat) 8,437 mg/kg; (dermal, rabbit) > 2 g/kg; (oral, human) 12 g
LDLO: (oral, human) 500 mg/kg; (oral, rabbit) 175 mg/kg
LCLO: 1000 ppm/10 min (S_2O); 600 ppm/30 min (H_2S) (species not given)
Effects of Acute Exposure to Product:
Inhaled: Low toxicity. Dust may be irritating to upper respiratory tract. Pre-existing respiratory disorders may be aggravated by exposure. H_2S or SO_2, which may be released by heat or chemical reactions, are both very toxic and may cause irritation, respiratory failure, coma and death without any warning odour being sensed.
In contact with skin: Low toxicity. Dust may cause irritation. Pre-existing skin disorders may be aggravated by exposure. Possible skin sensitization. Liquid sulphur causes burns.
In contact with eyes: Dust is an irritant. May cause injury to eye tissue if not promptly removed. Persons with pre-existing sulphur allergies may have more severe reactions to exposure to dust.
Ingested: Low toxicity. Not a normal route of exposure. Lethal dose > 12 g (human). Ingestion would likely cause gastrointestinal irritation, nausea, vomiting.
Carcinogenicity: Not listed by IARC, ACGIH, NTP.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: Not mutagenic in salmonella typhimurium.
Synergistic Products: None known.

PREVENTIVE MEASURES

Engineering Controls: Local exhaust ventilation required.
Respiratory Protection: Dust mask. NIOSH/OSHA approved air-purifying respirator or self-contained breathing apparatus for high or unknown concentrations of sulphur dust, or for fire or spill conditions.
Skin Protection: Impervious gloves (rubber or neoprene). Other protective clothing, sleeves, apron, boots, or coveralls, sufficient to prevent contact.
Other Personal Protective Equipment: Safety shower and eye wash fountain readily available in work area.
Leak and Spill Procedure: Evacuate area. Eliminate all sources of ignition. Cleanup personnel must be thoroughly trained in the handling of hazardous materials, and must wear protective equipment and clothing sufficient to prevent any contact or inhalation. Use proper grounding procedures to avoid static charge buildup. Gather up carefully using a natural fiber broom and/or aluminum shovel to reduce sparking. Be careful not to create dust as an explosion could result. Transfer carefully into container and arrange removal by disposal company. Wash site of spillage thoroughly with detergent and large amounts of water.
Waste Disposal: Dispose of in compliance with local, provincial and federal regulations.

Handling Procedures and Equipment: Combustible. Workers using this chemical must be properly trained in its hazards and its safe use. Wear appropriate protective clothing and equipment. Use approved combustible solid storage containers in the work area. Ground and bond equipment and containers to prevent a static charge buildup. Use non-sparking tools. Keep away from combustible materials, excessive heat, and ignition sources. Post NO SMOKING signs. Avoid generating dust or vapours. Avoid contact. Avoid inhalation. Use the smallest amount possible for the purpose in an area with adequate ventilation. Maintain good housekeeping procedures to avoid accumulation of dust. Keep well away from combustible and incompatible materials. Keep containers tightly closed. Empty containers may contain hazardous residues; treat with caution.

Storage Requirements: Store in cool, dry, well-ventilated area, out of direct sunlight, and away from heat or ignition sources and incompatible materials. Store away from incompatible materials and sources of ignition. Use grounded, non-sparking ventilation systems and electrical equipment. Keep containers tightly closed. Protect from damage.

FIRST AID MEASURES

Specific Measures:

Eyes: Flush eyes thoroughly with gently running water for at least fifteen (15) minutes, holding eyelids open while flushing. Do not allow victim to rub eyes. Avoid flushing contaminated water into unaffected eye. Get medical attention.

Skin: Remove contaminated clothing. Wash affected areas with soap and running water for at least fifteen (15) minutes. If irritation persists, get medical attention. Launder clothing before reuse, or discard.

Inhalation: Remove to fresh air. Give oxygen and get medical attention for any breathing difficulty. If breathing has stopped, give artificial respiration. If breathing and pulse are absent begin CPR. Get medical attention immediately.

Ingestion: Not a normal route of exposure. If large amounts are ingested, and if victim is alert and not convulsing, give 1 to 2 glasses of water to drink and get medical attention.

REFERENCES USED

Budavari: The Merck Index, 12th ed., 1997

Royal Society of Chemistry: Chemical Safety Data Sheets, Vol. 5, 1992

Sax, Lewis: Hawleys Condensed Chemical Dictionary, 11th ed., 1987

Suppliers Material Safety Data Sheets:

ADDITIONAL INFORMATION

Date Issued: 25-Nov-91

Revision: Apr 2015

Proposed WHMIS Designation: B4; D2B

Prepared by: Caledon Laboratories Ltd. (905) 877-0101

Appendix B. Expected Hazardous Materials Transported, Stored and Used On-site

Hazardous Material Types, Source, Quantities Generated, Potential Environment Effects, and Waste Management and Pollution Prevention Strategies

Type	Source	Estimated Quantity Used/Generated by Project Phase	Project Location Generated	Potential Environmental Effects	Waste Management and Pollution Prevention Strategies
Fuels and both new and used Petroleum Products (oils / lubricants / greases / hydraulic fluids)	Vehicles and equipment including generators and pumps	Construction 167 t/a Operations 627 t/a Closure 63 t/a	Goose Property and MLA	Petroleum products can accumulate on the surface of waterbodies or may sink to the bottom. Fish can uptake hydrocarbons in the environment. Feeding and reproduction of aquatic life (e.g., fish, plants, and insects) may be affected. Micro-organisms in soil degrade hydrocarbons, sometimes at the expense of plant nutrition. Petroleum products can damage the respiratory system if aspirated and be toxic if ingested.	Spill Response Procedures (safety procedures, initial assessment, spill report, containment, storage, and disposal) will be employed. When possible, waste oil will be used in incinerators or designated used-oil heaters. Waste oil may be collected and stored in empty bulk lubricant cubes to be stored in the designated hazardous waste section of the waste storage facility with secondary containment. Contaminated snow/water will be stored in clearly-marked, sound, sealed containers in the laydown yard and may be shipped off-site to an appropriate facility. Bioremediation may be considered for contaminated soil.
Used Oil and Fuel Filters	Vehicles and equipment	Construction 13 t/a Operations 39 t/a Closure 4 t/a	Goose Property and MLA	Petroleum products can accumulate on the surface of waterbodies or may sink to the bottom. Fish can uptake petroleum hydrocarbons once it is in their environment. Feeding and reproduction of aquatic life (e.g., fish, plants, and insects) may be affected. Micro-organisms in soil degrade hydrocarbons, sometimes at the expense of plant nutrition. Petroleum products can damage the respiratory system if aspirated and be toxic if ingested.	Waste oil and fuel filters will be drained in a heated and ventilated section of the maintenance shop. Filters will then be crushed to minimize volume and release any additional oil. This area of the maintenance shop will adhere to Sabina's Spill contingency plan and have a liner or tray to catch any spills or splashes. The filters will be placed in sealed containers and labelled and stored at the waste management facility. These containers may be shipped off-site to a registered hazardous waste receiver. Bioremediation of contaminated soils and treatment of contaminated water, snow and ice (see LWMP; SD-10).
Used Sorbents and Rags	Used in the maintenance of vehicles, equipment and spill control	Construction 2 t/a Operations 6 t/a Closure <1 t/a	Goose Property and MLA	Petroleum products can accumulate on the surface of waterbodies or may sink to the bottom. Fish can uptake petroleum hydrocarbons once it is in their environment. Feeding and reproduction of aquatic life (e.g., fish, plants, and insects) may be affected. Micro-organisms in soil degrade hydrocarbons, sometimes at the expense of plant nutrition. Petroleum products can damage the respiratory system if aspirated and be toxic if ingested.	Where possible, used rags and sorbents will be incinerated on-site. If incineration is not practical, used sorbents and rags will be stored in clearly-marked, sound, sealed containers in the laydown yard and then shipped off-site to a registered hazardous waste receiver.
Empty Petroleum Hydrocarbon Containers and Drums	Packaging for oils, solvents and penetrating oils	Construction 8 t/a Operations 28 t/a Closure 3 t/a	Goose Property and MLA	Petroleum products may accumulate on the surface of waterbodies or may sink to the bottom. Fish can uptake petroleum hydrocarbons once in the environment. Feeding and reproduction of aquatic life (e.g., fish, plants, and insects) may be affected. Micro-organisms in soil degrade hydrocarbons, sometimes at the expense of plant nutrition. Petroleum products can damage the respiratory system if aspirated and be toxic if ingested.	Sabina and its contractors will purchase these items in bulk to minimize the amount of packaging. Empty containers will be backhauled to the original supplier or a licensed recycling facility.
Glycol	Used as a coolant, capturing waste heat from generators, and antifreeze in equipment	Construction 9 t/a Operations 33 t/a Closure 3 t/a	Goose Property and MLA	Glycol's odour is a known wildlife attractant. Glycol can have toxic effects on aquatic organisms and wildlife.	Environmentally benign glycols will be used where practical. Equipment will be regularly maintained to prevent spills from ruptured glycol lines. Waste glycol will be stored within secondary containment within the waste storage facility in clearly marked, sound, sealed containers. These containers may be shipped off-site to a registered hazardous waste receiver. Unused glycol in the original containers may be returned to the manufacture for disposal or reuse at closure.

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Hazardous Material Types, Source, Quantities Generated, Potential Environment Effects, and Waste Management and Pollution Prevention Strategies (continued)

Type	Source	Estimated Quantity Used/Generated by Project Phase	Project Location Generated	Potential Environmental Effects	Waste Management and Pollution Prevention Strategies
Ammonium nitrate	Stored in 207 ISO containers	Construction and Operations 3,900 t/a (consumed)	Goose Property and MLA	If mixed with water, the resultant runoff may be acutely toxic to fish. Will also cause harm to vegetation if spilled.	**Transport** Certified and authorized Sabina employees or contractors will mix AN with FO at the on-site AN Facility or on a bulk ANFO truck at the blast hole. All explosives will be transported to site in dedicated containers; secondary containment will be used as required. Only qualified personnel holding valid blasting certificates shall handle these materials. Spills will be contained, cleaned up, and placed in suitable containers for use or disposal. All reportable spills will be reported to the spill response coordinator. Containers and equipment shall be inspected prior to use transporting explosives products on or between Project sites **Storage** All explosives will be stored only at safe distances from facilities or personnel. Explosives will be stored in a designated location within the explosives storage area and away from the explosive caps / detonator storage magazines. The magazines will be dedicated to storing high energy explosives and blasting caps. Explosives will be handled and managed only by suitably qualified employees trained in safe handling procedures and applicable legislation and regulations. Mine personnel involved in explosives spill response will have explosives training. Explosives stored in magazines will be clearly labelled. Spills shall be contained and placed in suitable containers for use or disposal. All reportable spills will be reported to a spill response coordinator. Access will be controlled to the AN Facility and explosives storage locations. Access to the explosives plant will be restricted to authorized personnel and log books shall be kept in each magazine for tracking purposes. **Blasting** Only certified and authorized mine employees or contractors will charge the holes, place the detonators and boosters, and tie-in the patterns. All blasting will follow applicable legislation such as DFO Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (DFO 1998). The Air Quality Monitoring and Management Plan will be followed to reduce or eliminate impacts from air. Wet blast holes will be lined with plastic liners prior to being loaded with ANFO. Packaged explosives will be used as a backup to ANFO for situations when blast holes cannot be lined. Sleep time in loaded blastholes will be limited to minimize contact between ANFO and water Spills shall be contained, cleaned up, and placed in suitable containers for use or disposal. All spills will be reported to a spill response coordinator. The mine shall record daily use of explosives. Records will be checked and reconciled on a regular basis. Explosives identified as deteriorated or damaged will be destroyed or disposed of; the supplier shall be consulted on the appropriate handling and disposal. Contact water will be managed in accordance with the Water Management Plan (SD-05). **Disposal** All explosives will be removed from site or disposed of at closure. Explosives will be secured and stored safely or disposed of in case of temporary closure. All explosives will be disposed of according to the SDS or manufacture. Spills will be contained, cleaned up, and placed in suitable containers for use or disposal. All spills will be reported to the spill response coordinator.

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Hazardous Material Types, Source, Quantities Generated, Potential Environment Effects, and Waste Management and Pollution Prevention Strategies (completed)

Type	Source	Estimated Quantity Used/Generated by Project Phase	Project Location Generated	Potential Environmental Effects	Waste Management and Pollution Prevention Strategies
Reagents	Additives required for mine processing and laboratory testing	Operations ~9,700 t/a (consumed) Closure <100 kg/a	Goose Property and MLA	Lab and processing reagents (hydrated lime, sodium cyanide, activated carbon, sodium hydroxide, hydrochloric acid, sulphur, copper sulphate, MBS, flocculant, and antiscalant) may enter the environment from spills and leaks from containers, process equipment or from improper storage. Once in the environment, some may cause harm to the terrestrial and aquatic ecosystem by entry of deleterious and other polluting substances (e.g., cyanide).	Spill prevention procedures will be developed. Spill Response Procedures to respond to the spill (safety procedures, initial assessment, spill report, containment, storage, and disposal). Spent reagents will be collected and stored in clearly-marked, sound, sealed empty bulk containers. Containers will be stored in the designated hazardous waste section of the waste storage facility. Reagents may be shipped off-site to a registered hazardous waste receiver Unused reagents will be sent back to the manufacture as required in original containers at closure. Management of cyanide-containing materials (sodium cyanide reagent, residual cyanide in process water) described in stand-alone management plan, presented as Appendix A of the HMMP (SD-13).
Solvents	Used to degrease machinery in the maintenance shop	2000 L/a Construction / Operations / Closure	Goose Property and MLA	Petroleum fuels can accumulate on the surface of waterbodies or may sink to the bottom. Fish can uptake petroleum hydrocarbons once it is in their environment. Feeding and reproduction of aquatic life (e.g., fish, plants, and insects) may be affected. Petroleum products can damage the respiratory system if aspirated and be toxic if ingested.	Low toxicity solvents and physical cleaning (e.g., steam jet) will be used where practical. Petroleum-based solvents will not be allowed into the environment and will be subject to the spill response plan. Waste or excess solvents will be stored in the waste storage facility in clearly marked, sound, sealed containers. These containers may be shipped off-site to a registered hazardous waste receiver. Unused solvents in the original containers may be returned to the manufacturer for disposal or reuse at closure.
Paints		100 L/a Construction /Operations /Closure	Goose Property and MLA		When feasible, latex paints will be used on-site. Latex paints should be collected in a covered area and opened to dry. Unused full containers of paint will be returned to the manufacturer, if possible. Paint containing hazardous materials, that cannot be used will be sealed and shipped off-site to a registered hazardous waste receiver.
Fluorescent Light Tubes	Indoor lighting	<1 t/a Construction / Operations /Closure	Goose Property and MLA	Fluorescent tubes contain mercury phosphor powder and traces of lead and cadmium.	Lights should be equipped with motion sensors to reduce usage where practical. Discarded fluorescent lights will be consolidated together and stored indoors in the waste storage facility in their original packaging. Fluorescent light tubes may be shipped off-site to a registered hazardous waste receiver.
Electronics and Electrical Materials	Electrical devices that cannot be repaired and cannot be recycled	<1 t/a Construction /Operations /Closure	Goose Property and MLA	Electrical waste and devices may or may not contain polluting substances (such as mercury, lead, arsenic, cadmium, and polyvinyl chloride (PVC) that could enter the ecosystem.	Sabina's environment staff will determine the risk of electronic devices and classify them as hazardous or non-hazardous waste and determine the appropriate method of recycling/ disposal.
Equipment Batteries	Equipment batteries	4 t/a Construction/ Operations /Closure	Goose Property and MLA	Lead batteries (i.e., vehicle batteries) contain sulphuric acid and lead harmful to environmental receptors. Rechargeable batteries (i.e., industrial forklift, radio and transmitter batteries) usually contain either potassium hydroxide or nickel cadmium with toxic effects.	Protect and service batteries to prevent damage and loss of charge. Test batteries prior to disposal to confirm the battery is spent. All batteries will be shipped off-site to a recycling facility or a registered hazardous waste receiver.
Biomedical Waste	Small amounts of medical waste from First Aid (e.g., syringes, used medical supplies)	<100 kg/a Construction /Operations /Closure	Goose Property and MLA	May be sharp or may contain bacteria and viruses which can be a risk to human or wildlife health.	Written procedures will be developed and implemented regarding the handling, storage, transport and disposal of biomedical waste, consistent with the Nunavut guideline (GN, 2014). Pollution prevention strategies include training staff in the adopted procedures for handling of biomedical waste; permitting only trained workers to handle biomedical waste; appropriate segregation and disposal of biomedical wastes separate from generate garbage and according to the type of biomedical waste; using appropriate containers for safe storage of biomedical wastes (e.g., sharps containers for used needles and other sharps); appropriately labelling biomedical waste in accordance with WHMIS requirements; record keeping; use of appropriate personal protective equipment (PPE); waste transport in accordance with applicable regulations; and final disposal at a registered hazardous biological waste receiver. Medical waste will not be incinerated on-site as it poses a handling risk from sharps for the incinerator operator and workers collecting waste.
Aerosol Cans		<100 kg/a Construction /Operations /Closure	Goose Property and MLA		Pressurized aerosol cans will be punctured on-site and landfilled.
Kitchen grease	Camp kitchens	40 t/a Construction /Operations /Closure	Goose Property and MLA		Collected in sealed containers and incinerated or shipped off-site for disposal.

Notes: Goose = Goose Property, MLA = Marine Laydown Area

Appendix C. Sabina Internal Report Form

SABINA INTERNAL SPILL REPORT FORM

This form is to be used for internal documentation of spills of any petroleum product, chemical, ethylene glycol (antifreeze), or other hazardous material. See recent Spill Contingency Plan for reporting thresholds and structure. Once complete file with the Operations Superintendent.

***Report Date and Time*:**	***Spill Date and Time*:** ☐ Spill occurred ☐ Spill observed
***Spill Location*:** ☐ Goose ☐ Marine Laydown Area ☐ George ☐ Other (e.g. Drill, Boulder Pond)	***Describe Location*:**
***Coordinates (Lat/Long or UTM)*:**	

***Product(s) Spilled*:**	Jet fuel	Diesel (P50)	Gasoline	AvGas	Oil (type)	Antifreeze	Other (describe)
***Quantity (L or kg)*:**							

Personnel Involved:	☐ Sabina ☐ Contractor ☐ Visitor ☐ Other

***Cause of Spill*:**
***Containment/Cleanup Measures Taken*:**
***Factors Affecting Spill or Recovery (weather, snow, ground conditions, etc.)*:**
***Additional Action Required*:**
***Additional Comments*:**

	Name	***Employer***	***Signature***
***Reported by*:**			
***Reported to*:**			

Appendix D. NWT-NU Spill Report Form

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR	REPORT TIME	☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER ____-_____
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME		

C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS

F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION	
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION	
H	PRODUCT SPILLED	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
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS		

L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (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			