DOMINION DIAMOND

December 19, 2014

Violet Camsell-Blondin- Chair
Wek'èezhìi Land and Water Board
#1, 4905 – 48th Street
Yellowknife, NT
X1 3S3

Dear Ms. Camsell-Blondin

Re: Dominion Diamond Ekati Corporation Land Use Permit W2013C0005
Ekati Claim Block Drilling Exploration -Annual Workplan- December 2014 Revision

Please find attached the 2015 Annual Workplan for Land Use Permit W2013C0005 winter drilling program from Dominion Diamond Ekati Corporation (Dominion Diamond). The five (5) year land use permit was issued on October 30, 2013 and entitles Dominion Diamond to conduct drilling operations, geochemical and geophysical surveys, winter road construction and the use of vehicles and machines including earth-moving equipment within the permitted boundary. All 2015 exploration activities including Sable, Lynx and Jay Work areas are contained within the boundaries of the land use permit W2013C0005. As per condition (56) of the land use permit, Dominion Diamond is required to submit an Annual Workplan for approval by the Wek'èezhìi Land and Water Board (WLWB) prior to October 15th of each year.

In addition to the Jay and Lynx Pit exploration activities, Dominion Diamond is investigating the Sable Pit area. This will include the construction and use of the Sable winter trail which will be constructed in accordance with the land use permit. Golder conducted an archaeological field assessment of the winter road identifying potential sites, satisfying condition (39) of the land use permit. As a result Dominion Diamond re-routed the road to avoid the sites. It was requested that Prince of Wales Northern Heritage Centre (PWNHC) confirm that recommended alternate measures were sufficient to proceed with the winter road and alignment. On September 3, 2014, Glen MacKay, Assessment Archaeologist at PWNHC, confirmed that after reviewing the memo the setbacks were sufficient for avoidance and no further measures were required. This memo will fall under the confidentiality cover for the protection of Archaeological information.

The following documents are included in this submission;

1. Planned activities for upcoming 12 months including updated work area and drilling maps, ARC GIS files and co-ordinates

2. Season Report for Exploration Activities Completed in 2014 under Land Use Permit W2013C0005
3. Archaeological Technical Memo from Golder (as per condition 39)-Confidential Cover.
4. MSDS Sheets

Note: Though the original document was submitted in October 2014, it was re-submitted in November after comments and recommendations from interested parties were addressed by Dominion Diamond following the review period. A revision from these recommendations was posted on the WLWB public registry.

This current document has been revised further. Per Part C: 26(1)(a) condition 1, which requires target drill hole locations to be confirmed, this workplan includes the following changes;

- 12 drill hole locations for RC drilling over Jay pit;
- as per discussions with the inspector the silt will not be collected in large bags but will be collected in vacuum trucks and deposted in the appropriate authorized sump locations; and
- diamond drilled boreholes will be advanced to depths up to 450 m as per last year's program.

We trust that you will find this information complete and thorough. Please contact the undersigned at 669-6145 regarding this annual work plan.

Sincerely,

Nicole Spencer
Senior Advisor Permitting

CC: Marty Sanderson

2015 Annual Work Plan for Land Use Permit W2013C0005

(Updated December 16, 2014)

Introduction

Land Use Permit W2013C0005 was approved by the WLWB for a period of five (5) years commencing October 24, 2013 and expiring October 23, 2018.

This permit entitles Dominion Diamond Ekati Corporation (Dominion) to conduct drilling operations, geochemical and geophysical surveys, winter road construction and the use of vehicles and machines including earth-moving equipment. All activities will occur in the Ekati claim block owned by Dominion (Minimum latitude: 64° 28' N, Maximum latitude: 65° 00' N, Minimum longitude: 111° 50' W, Maximum longitude: 111° 32' W.

Description of the drilling programs and associated winter road construction and site preparation (including land disturbance, equipment, chemicals, potential impacts and mitigation measures) are provided in the complete land use permit application which was filed in October 2013. Additional details are provided herein.

Dominion plans to commence preparatory activities (i.e., winter road construction and preparation of drilling pads) in December 2014. These activities will be followed by mobilisation of drills and ancillary equipment in early February 2015.

The following tasks will be performed from lake ice during the winter 2015 field investigation program:

- Large-Diameter Reverse Circulation drilling;
- Air-track, rotary-percussive destructive drilling;
- Sonic drilling;
- Cone Penetration Testing (CPT);
- Diamond drilling;
- Thermistor installation.

Large Diameter Reverse Circulation Drilling

Large diameter reverse circulation (RC) drilling programs are planned for the 2015 Winter drill season at two kimberlite pipe locations, the Sable kimberlite located north of Ursula lake and the Jay kimberlite which is within Lac du Sauvage. Ten (10) RC drill holes are planned for each kimberlite. The sites will each have a dedicated rig and ancillary equipment as detailed below. The drilling procedures are essentially the same for both programs.

Drilling at the Sable kimberlite site will be accomplished using a BF-800 truck-mounted rig owned and operated by Foraco Canada Ltd. at the Sable kimberlite site, accessed by winter road from Ekati. The 2015 drilling program includes ten (10) 24-inch diameter holes that will be advanced from lake ice to final depths of approximately 350 metres. Coarse sample cuttings from this program will be transported to the sample plant at Ekati for processing.

RC drilling at the Jay kimberlite site will be completed using a BF-800 truck-mounted rig or equivalent drill rig owned and operated by Foraco Canada Ltd. The site is accessed by winter road from the Misery Camp. The 2015 RC drilling program includes ten (10) 22-inch diameter holes that will be advanced from lake ice to final depths of approximately 300 metres. Coarse sample cuttings will be transported to the sample plant at Ekati for processing.

Two main steps are involved in drilling. First, drill casing must be lowered to lake-bottom. Casing is hammered through overburden. A hammer bit is lowered through the drill casing and rests on a lip attached to the bottom of the casing (casing shoe). The casing shoe has a rotating bit and the casing is effectively drilled down through the overburden.

Once the casing has been advanced a few meters into the kimberlite and achieves a good casing seal, drilling and sampling of the kimberlite can begin. The hammer bit is removed and replaced with a tri-cone drill bit attached to the bottom of the drill pipe. The drill is then set up for flooded reverse drilling and the closed fluid circulation system begins. RC drilling uses a dual-walled pipe (pipe within a pipe); compressed air is injected between the inside of the outer pipe and outside of the inner pipe to flush cuttings from the bit face.

Sample cuttings are routed to the inside of the inner pipe, up the hole, and to the surface through a discharge hose. The drill cuttings and drill water are separated from the air in a cyclone and gravity fed onto a shaker screen. The cuttings vibrate down the screen and are collected in large bags. The drill water and fines drop through the screen and into a mud tank. This fluid is continually re-circulated down between the drill pipe and the walls of the drill hole and up the drill pipe. Water consumption is estimated at 20 to 25 cubic metres per day.

The hole is then calipered to calculate its volume.

A vacuum truck is used to remove the fines from the RC drill mud tank. As discussed previously with the Inspector, the material is then pumped into an approved sump location or put into large bags for disposal in a permitted land farm.

Note: DDEC will be using a vac truck at Sable (and at Jay) and will dispose of fine cuttings in an approved sump. As per established operating procedures and as will be discussed with the Inspector, the sump location will be field checked and authorized by the Inspector prior to its use. This is best accomplished once access to the drill and sump area has been established. A site has not been pre-selected at this time but will be prior to operations with Inspector approval (as per Item 4. from IEMA - Recommendation to the WLWB review process).

Air-Track Drilling

Air-track drilling will be carried out to determine depth to bedrock in locations where water depth is 6 m or less, as well as on islands and the dike abutments. The 2015 drilling program includes ninety-nine (99) boreholes along proposed dike alignments in Lac du Sauvage for the Jay Dike.

Information collected will complement the data gathered during the 2014 investigation programs, including the geophysical survey, and will aid in the delineation of bedrock depth along the dike alignment.

Air track drilling is a rotary–percussive method of drilling using an air-pneumatic top hammer. Drill rods are rotated and percussed by the drill head on the rig. Drills are typically self-contained, track-mounted, with a high visibility operator's cabin and rod handling system. A Sandvik DX500 (formerly known as a Tamrock Ranger 500), or similar drill rig, will be used to carry out this work. Boreholes located on land or where ice is grounded on the lakebed surface will be advanced with air flush. Drill cuttings from these borehole locations may be collected and tested. The remaining boreholes will be advanced with either air or water flush. It is anticipated that limited to no samples will be obtained from these locations, and just the thickness of the soil layer and depth to bedrock will be recorded. Boreholes will be extended approximately 3 m into bedrock for confirmation. No grouting or sealing of the boreholes will be conducted.

Sonic Drilling

Sonic drilling will be used to core both soil and bedrock along proposed dike alignment options at Jay and at Lynx to characterize the till and overburden. The Sonic drilling will occur at locations where lake water depths are greater than 6 m, and hydraulic head acting on the proposed dike will be greater. The 2015 drilling program includes sixty-four (64) boreholes along proposed dike alignments in Lac du Sauvage for the Jay dike alignment and fifteen (15) boreholes at Lynx.

The primary objective of the sonic drilling is to characterize the nature and variation of the soil layers beneath the proposed dike and to determine the depth to bedrock. Recovered soil will be geotechnically logged according to Golder Associates' soil classification system. Geotechnical laboratory testing will be performed on selected samples.

Investigations will be completed using an LS-600 Rotosonic drill rig that is owned and operated by Major Drilling. A smaller rig may be deployed at Lynx (also owned and operated by Major Drilling). The sonic drilling method uses relatively high frequency mechanical vibration, down-pressure and optional rotation to advance an inner drill string and an outer casing. A one-piece core barrel with a 150 mm diameter is threaded onto the bottom of the inner drill string and obtains samples. The core barrel and outer casing are advanced by fracturing, shearing and/or

displacing the formation materials. Casing of 219 mm (8 5/8") is set to lakebed and casing of 194 mm (7 5/8") is advanced behind the coring. In relatively hard formations, the frequency of vibration is varied by the drill rig operator in an attempt to establish and maintain resonant frequency within the drill string and outer casing. Resonant frequency within the drill string and outer casing allow the inertia of the drill bit and casing shoe, respectively, to fracture relatively hard materials. In relatively soft formations, it is possible to advance the drill string and casing using down-pressure alone.

When drilling through sediments and glacial till, the drill string and outer casing are advanced independently. The drill bit face on the core barrel is advanced approximately 1.5 m below the outer casing shoe using down-pressure, vibration and/or rotation. The outer casing shoe is then advanced to approximately 0.3 m above the drill bit face using down-pressure, vibration, rotation and water flushing to avoid trapping material between the core barrel and the outer casing. The core barrel and drill string are retracted from the outer casing to bring the core barrel sample to the surface. A hole rod (a drill rod with a drainage hole) is installed above the core barrel to drain water from the drill rods during core barrel retraction. Core barrel samples are then extruded into plastic liner bags that are supported by aluminium sample trays. A plastic core catcher is generally installed within the core barrel when advancing through the sediment and glacial till materials.

A wet coring method is used when drilling into bedrock materials and through suspected boulders. The hole rod is replaced with a standard rod and the core barrel is advanced using vibration, rotation and water flushing to cool the drill bit. Once the drill bit is advanced below suspected boulders the hole rod is re-installed and water flushing during coring will be stopped. Where bedrock is encountered, wet coring is used to advance the core barrel approximately 2 m into the bedrock formation.

After reaching the final depth of investigation at each borehole location, in-situ hydraulic conductivity testing will be carried out. This may be carried out using a downhole packer system or with the temporary installation of a standpipe piezometer. Once this testing is completed, the packer or the temporary standpipe are removed from the borehole. A cement-bentonite grout will be placed in each borehole before retracting the outer casing. The grout will be mixed and placed using tremmie methods (25 mm nominal diameter PVC tube).

Cone Penetration Tests (CPT) will be carried out using the sonic rig to aid in carrying out the testing. A total of twelve (12) CPT are proposed to further characterize the lakebed sediments.

Each test will be advanced within lakebed sediments until refusal is reached. CPT will be performed before soil coring starts at a given borehole location. Data collected will provide geotechnical parameters of the lakebed sediments. It is assumed that the CPT will reach refusal in the competent soil, due to the higher density and granular nature of this material. This information will be used for the Jay Dike detailed design and will allow for an improved

estimation of anticipated depths to which initial rock fill materials may settle during placement, and estimation of amount of lakebed sediment that will require removal from the central trench.

Diamond Drilling and Hydrogeological Testing

A diamond drilling and hydrogeological testing program will be carried out to characterize the range of potential bedrock conditions underlying the proposed dike alignments in Lac du Sauvage for the Jay Dike, in the bedrock surrounding the Jay pipe and to facilitate thermistor installation, which will also take place at Lynx Lake. Twenty-six (26) diamond drilled boreholes are proposed over the Jay kimberlite site and along the proposed dike alignments on Lac du Sauvage and two (2) holes are planned on the shore at Lynx Lake.

The objectives of the diamond drilling program are to assess rock quality, the hydraulic conductivity of the bedrock, and the potential presence/mobility of silt infilling materials within the near-surface bedrock. The holes along the dike alignment address the grout curtain that will form part of the dike design, the fracture types and continuity, along with infilling types must be determined in order to assess the presence of materials that may be susceptible to erosion.

Diamond drilled boreholes will be advanced to depths up to 450 m, depending on the location, bedrock elevation, and the anticipated hydrology. Proposed drilling depths may be increased if adverse conditions (e.g., faults, very to extremely closely fractured bedrock, high permeability intervals etc.) are encountered. Diamond drilling is to be carried out using HQ3 (triple tube) wireline drilling techniques through PQ (or equivalent HW) diameter casing wash-bored to the soil/bedrock interface, and advanced (via open-shoe boring) 0.2 m to 0.3 m into bedrock. This methodology is similar to that used for the Jay 2014 winter drilling program.

Recovered core will be photographed and geotechnically logged (e.g. weathering state, rock strength, bedding, discontinuity type and spacing). Although recovery of rock core is expected to be good, the drilling process typically disturbs soil and melts ice samples. Therefore little to no recovery of soils and ice is anticipated (and consequently, the reason that both sonic and diamond coring investigation techniques are required). Rock core will be logged according to Golder's standard practice for the collection of geotechnical data.

Testing bedrock for hydraulic conductivity and potential mobility of in-filled materials will be performed. Each diamond cored hole will be tested in approximately 5 m lengths, with overlapping intervals, along the entire drilled length into bedrock. A combination of slug injection, slug withdrawal and constant rate injection testing will be employed pending bedrock conditions encountered within each hole.

Note: Each borehole will be backfilled to the top of the bedrock with a mix of cement/water/bentonite, following completion of drilling and hydrogeological testing (as per Item 1. from IEMA - Recommendation to the WLWB review process).

Thermistor Installation

Thermistor cable strings, each with up to sixteen (16) thermistor measuring points will be installed in boreholes to monitor ground temperature data. The thermistor string will be inserted using a PVC pipe. After lowered in place, the borehole will be grouted with a cement bentonite mix. The PVC pipe will stick up from the complete and grouted borehole and be connected to a data logger within a protective case.

It is anticipated that the diamond drill rig will be used to drill the boreholes and perform the thermistor installation. Each thermistor is to be backfilled with a mix of cement/water/bentonite. A total of six (6) thermistor installations are proposed for the Lac du Sauvage 2015 drill program and two (2) are proposed for Lynx Lake.

Note: Upon abandonment, the monitoring equipment will be removed, and all above ground cables cut off at ground level. The instruments (typically the blue cable in the attached photos) is grouted into the holes. All casing will be cut away up at ground level as required.

Attached to this workplan are example pictures of “Jay Island” thermistor installation as well as a location map for the Winter drilling program 2015- Jay and Lynx thermistors (as per Item 2. from IEMA - Recommendation to the WLWB review process).

Drill Rigs and Ancillary Equipment

A truck mounted large-diameter reverse circulation drill rig will be used to obtain a bulk sample from the Sable and Jay kimberlite pipes and will use the following equipment:

- BF-800 drill rig mounted on a truck: 31,400 lbs
- Pipe Rack with 350 m pipe and collars: 40,000 lbs
- 3 Compressors (combined weight): 23,100 lbs
- Boiler full of fuel and water: 18,500 lbs
- Generator (40 ft. C can): 6,500 lbs
- Pallets of mud, rig mats: 8,500 lbs
- Solids Control Unit with 20,000 liters water: 38,000 lbs
- Picker truck (in the work area): 15,000 lbs
- Doghouse (40 ft. C can): 7,500 lbs
- Loader with forks: 13,750 lbs
- Vac Truck (loaded): 30,000 lbs
- 3 pickups (one with full fuel tanks): 15,000 lbs

A tracked top-hammer percussive drill rig (32,000 lbs), will be used to determine depth to bedrock.

A track mounted sonic drill will be used to core overburden and till samples along the proposed dike alignments and will utilise the following equipment:

- LS 600 drill rig: 43,400 lbs
- SVC 600 support unit: 42,000 lbs
- Rig truck and core shack: 26,000 lbs
- Supervisor truck and Hot box (Allmand heater): 9,000 lbs
- 20 kw light tower: 2,400 lbs

The diamond drilling programs will be carried out to characterize the range of potential bedrock conditions underlying the dike and will utilise the following equipment:

- Cat 950 Loader (40,000 lbs) and Cat 966 Loader (53,000 lbs)
- Diamond Drill Rigs (Major 50) skid mounted hydraulic rigs with rod handling capability (each drill weighs 33,000 lbs)
- 1 Rod Container 10,000 lbs
- 2 - C Can Heater/Gen/Coil 28,000 lbs
- 3 4x4 Trucks @ 9,000 lbs
- 3 Frost Fighter 2,100 lbs
- 2 Sludge Tanks 10,000 lbs
- 54 Bundles Assorted Drill Rod (3m lengths) 66,000 lbs
- 2 Pallet Oils @ 3200 lbs
- 4 Crates 4x4x4 Assorted Drill Supplies 4,000 lbs

Use of Chemicals

The chemicals that will be used during the 2015 field investigation are summarized in Table 1.

Table 1: Summary of chemicals that will be used during the 2015 field investigation

Chemical / Product Name	Purpose
Bentonite	Instrument installation and borehole grouting
MAPAC	Bentonite additive
Hole Control	Drilling mud for hole stabilization
Torqueless	Drilling lubricant (vegetable oil based)
Rock Drill Oil	Drill Lubricant (vegetable oil based)
Cement	Instrument installation and borehole grouting
Silica Sand	Instrument installation
Hydrochloric Acid	Core logging
Diesel and Gasoline	Equipment fueling

Note: The MSDS sheets for the chemicals being used at each drill will be displayed at the drill for the duration of the program (as per Item 3. from IEMA - Recommendation to the WLWB review process).

89500.000000 90000.000000 90500.000000

8638000.000000 8637500.000000 8637000.000000

N

0 65 130 260 390 520
Meters

Winter 2015 - Jay RC Drilling Collar Location

1:5,000

Legend

- Jay RC Holes
- Jay Permitted Drilling
- Jay Work Area
- Misery to LdS Winter Trail
- Jay Drilling Access
- Jay Sump
- Winter Road

Coordinate System: NAD 1983 Northwest Territories Lambert
Projection: Lambert Conformal Conic
Datum: North American 1983
False Easting: 0.0000
False Northing: 0.0000
Central Meridian: -112.0000
Standard Parallel 1: 62.0000
Standard Parallel 2: 70.0000
Latitude Of Origin: 0.0000
Units: Meter

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FOR: Dominion Diamond Ekati Corporation
Date: 12/10/2014

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Winter 2015 - Jay RC Drilling Location

1:24,000

Legend

- Jay RC Holes
- Jay Permitted Drilling
- Jay Work Area
- Misery to LdS Winter Trail
- Jay Drilling Access
- Jay Sump
- Winter Road

Coordinate System: NAD 1983 Northwest Territories Lambert
Projection: Lambert Conformal Conic
Datum: North American 1983
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False Northing: 0.0000
Central Meridian: -112.0000
Standard Parallel 1: 62.0000
Standard Parallel 2: 70.0000
Latitude Of Origin: 0.0000
Units: Meter

Created by : K. Ferguson
FOR: Dominion Diamond Ekati Corporation
Date: 12/10/2014

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Season Report for Exploration Activities Completed in 2014 under Land Use Permit W2013C0005

Introduction

Exploration activities under LUP - W2013C0005 began on January 28 and were completed May 4, 2014. The workplan had been approved to the WLWB on February 11, 2014. Upon completion all equipment was removed excepting a sampling station at the Westbay Well installation.

During this program Dominion Diamond Corporation (Dominion) conducted drilling operations, winter road construction, installation of thermistors and installation of a Westbay Well.

All activities occurred within the Ekati Claim block held by Dominion (Minimum latitude: 64° 28' N, Maximum latitude: 65° 00' N, Minimum longitude: 111° 50' W, Maximum longitude: 111° 32' W). LUP - W2013C0005 entitles Dominion Diamond Ekati Corporation (Dominion) to conduct drilling operations, geochemical and geophysical surveys, winter road construction and the use of vehicles and machines including earth-moving equipment.

Drilling

There were 56 holes drilled for the Jay Winter 2014 Program. Holes were moved, added or removed as required during the drilling. All changes were reported to the Inspector. Please see Appendix 1for maps showing drill hole locations.

A sump was used to contain drilling fluids as indicated on the attached figures. The location had been pre-approved by the Inspector.

Sonic Drilling

Investigations were completed using an LS-600 Rotosonic drill rig that is owned and operated by Major Drilling. For information on the sonic drilling method please see the attached Work Plan 2014. Packer testing was conducted in 28 of the drill holes, material recovery, logging and sampling of the material from all holes was completed.

Diamond Drilling

Investigations were completed using a Dura-Lite rig and 2 Major 50 rigs. Data collection included the following:

- Abutment stratigraphy, sample collection, and thermistor installation;

- Core recovery from boreholes at proposed channel cut locations to characterize stratigraphy and geochemistry;
- Core collection of soils and rock, with on-site core logging and photography for geotechnical description with respect to rock mass and joint characterization; and
- Hydraulic conductivity testing of bedrock for selected boreholes by single packer method.

On land diamond drill holes were completed by the Dura-Lite rig, which is smaller and lighter than the Major-50 rigs, a total of 28 drill holes were completed.

Table 1: Summary of drilling for the 2014 field investigation

Type of Drilling	Number of Holes	Meterage
Diamond	28	4,128
Sonic	28	848
Total	56	4,976

Use of Chemicals

The chemicals that were used during the 2014 field investigation are summarized in Table 2.

Table 2: Summary of chemicals used during the 2014 field investigation

Chemical	Purpose
Bentonite	Instrument installation and borehole grouting
Cement	Instrument installation and borehole grouting
Silica Sand	Instrument installation
Hydrochloric Acid	Core logging
Diesel and Gasoline	Equipment fueling
Uranine	Water flow tracer dye
Rhodamine	Water flow tracer dye

Installations

There were 8 installations required for investigations during the Jay Winter 2014 drill program. Please see Appendix 1 for a map showing installation locations.

Thermistor Installation

Thermistor cable strings, each with up to 16 thermistor measuring points were installed in boreholes to monitor ground temperature data. The thermistor strings were inserted using a PVC pipe. After being lowered into place, the borehole was grouted with a cement bentonite mix. The PVC pipe sticks up from the complete and grouted borehole and is connected to a data logger within a protective case.

Westbay Installation

A Westbay Well was installed at JGT-06, this system allows monitoring and collection of groundwater samples from multiple zones within a single borehole. The installation will be used to monitor and collect samples.

Table 3: Summary of installations during 2014 field investigation

Installation Type	Number of Installations	Meterage
Thermistor	7	835
Westbay Well	1	461
Total	8	1,296

Access Roads

Access roads were completed on Lac du Sauvage and no overland routes were constructed under DDC's LUP due to a lack of snow for route building despite being originally planned and approved.

Please see Appendix 1 for a map showing access road locations.

APPENDIX 1: Jay Winter 2014 Maps

Map 1: Jay Winter 2014 Drilling and Access

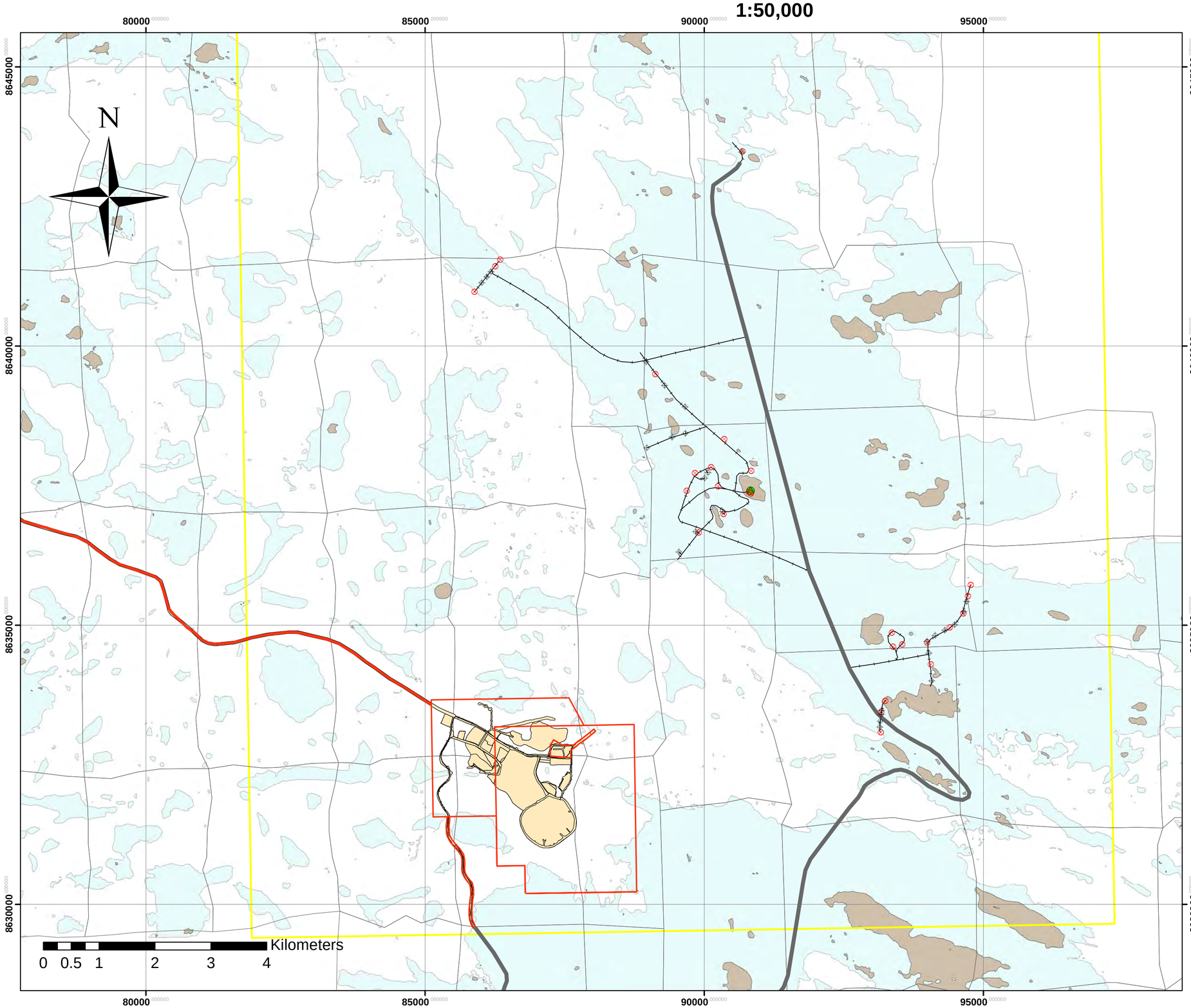
Map 2: Jay Winter 2014 Ice and Land Based Drilling

Map 3: Jay Winter 2014 Thermistor and Westbay Installations

Jay Winter 2014 Drilling and Access

SCALE

1:50,000



Legend

Jay Winter 2014 Drilling

TYPE

- D
- S
- Jay Sump
- Winter_Road
- Current Leases
- Winter 2014 Drill Pad Access
- Misery Camp
- Ekati Block
- Jay Winter 2014 Work Area
- Lakes

Coordinate System: NAD 1983 Northwest Territories Lambert
Projection: Lambert Conformal Conic
Datum: North American 1983
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False Northing: 0.0000
Central Meridian: -112.0000
Standard Parallel 1: 62.0000
Standard Parallel 2: 70.0000
Latitude Of Origin: 0.0000
Units: Meter

Created by : K. Ferguson
FOR: Dominion Diamond Ekati Corporation

Date: 8/26/2014

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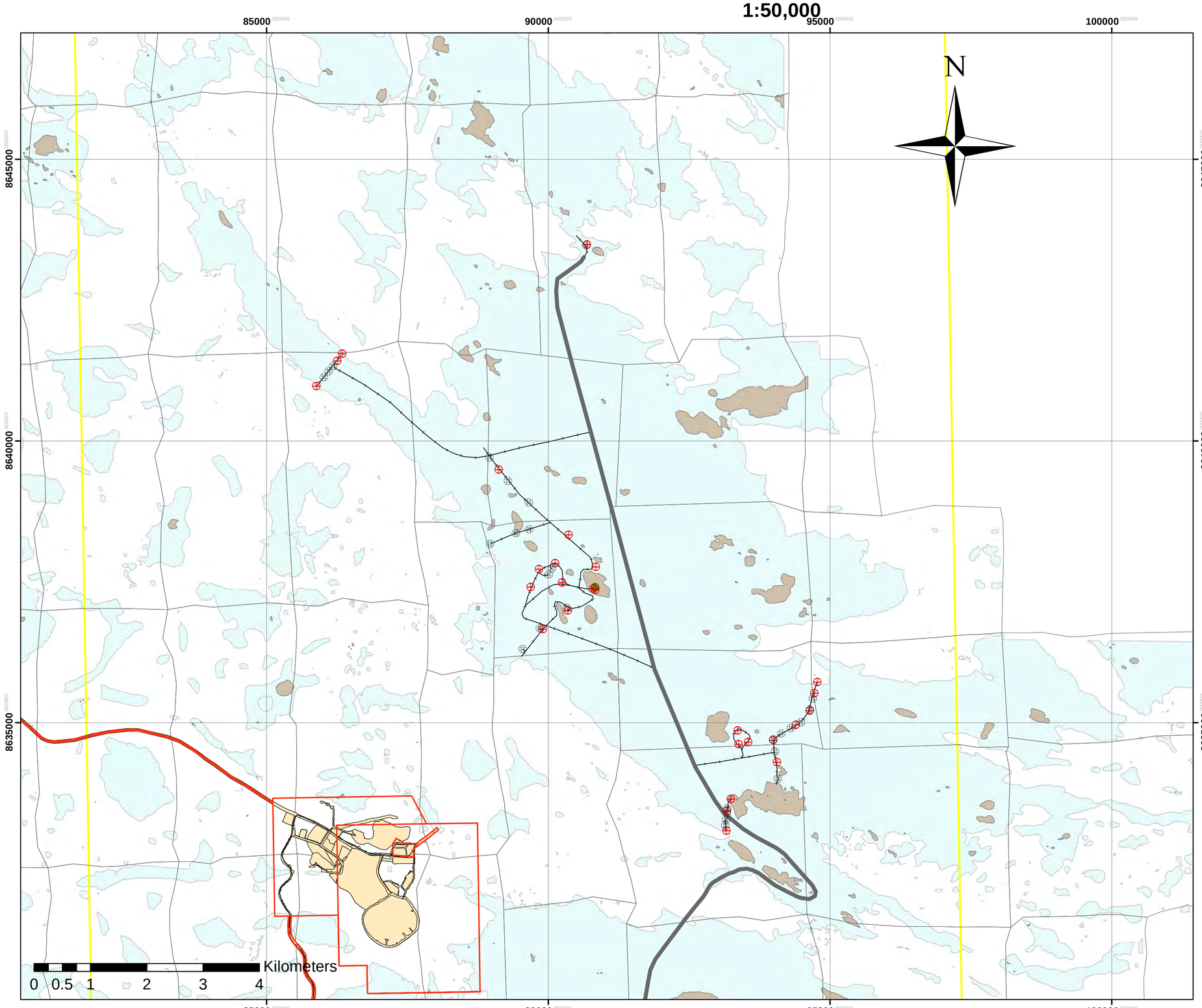
Jay Winter 2014 Drill Hole Locations and Access

SCALE

1:50,000



Legend

Drill Collars

Drill Type

- Diamond Drill Hole
- Sonic Drill Hole
- Jay Sump
- Winter Road
- Current Leases
- Winter 2014 Drill Pad Access
- Misery Camp
- Ekati Block
- Jay Winter 2014 Work Area
- Lakes

Coordinate System: NAD 1983 Northwest Territories Lambert
Projection: Lambert Conformal Conic
Datum: North American 1983
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False Northing: 0.0000
Central Meridian: -112.0000
Standard Parallel 1: 62.0000
Standard Parallel 2: 70.0000
Latitude Of Origin: 0.0000
Units: Meter

Created by : K. Ferguson
FOR: Dominion Diamond Ekati Corporation

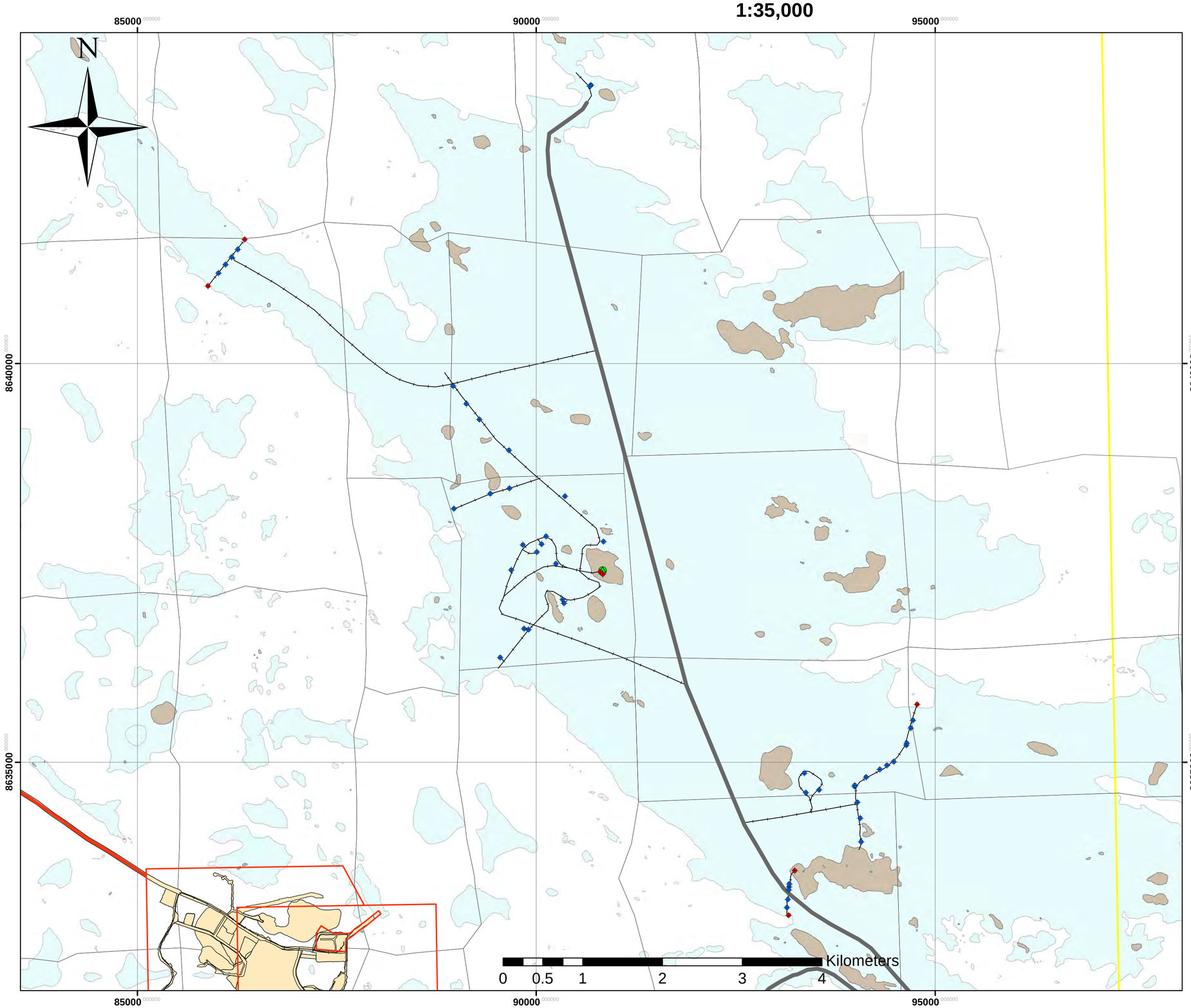
Date: 8/28/2014

DOMINION DIAMOND

Jay Winter 2014 Ice and Land Based Drilling

SCALE

1:35,000



Legend

Jay Winter 2014 Drilling

Land_Lake

- Land
- Ice
- Jay Sump
- Winter Road
- Current Leases
- Winter 2014 Drill Pad Access
- Misery Camp
- Ekati Block
- Jay Winter 2014 Work Area
- Lakes

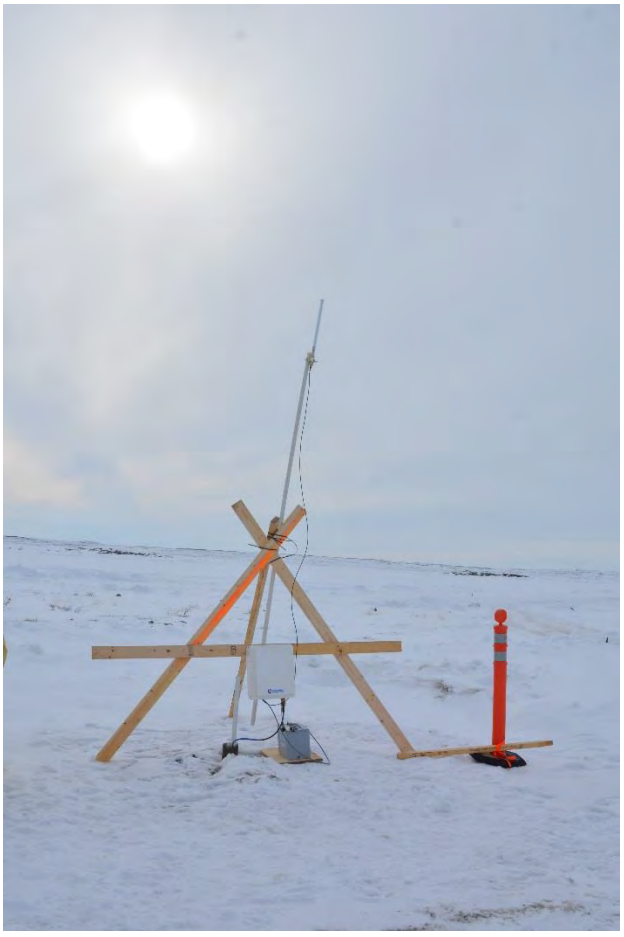
Coordinate System: NAD 1983 Northwest Territories Lambert
Projection: Lambert Conformal Conic
Datum: North American 1983
False Easting: 0.0000
False Northing: 0.0000
Central Meridian: -112.0000
Standard Parallel 1: 62.0000
Standard Parallel 2: 70.0000
Latitude Of Origin: 0.0000
Units: Meter

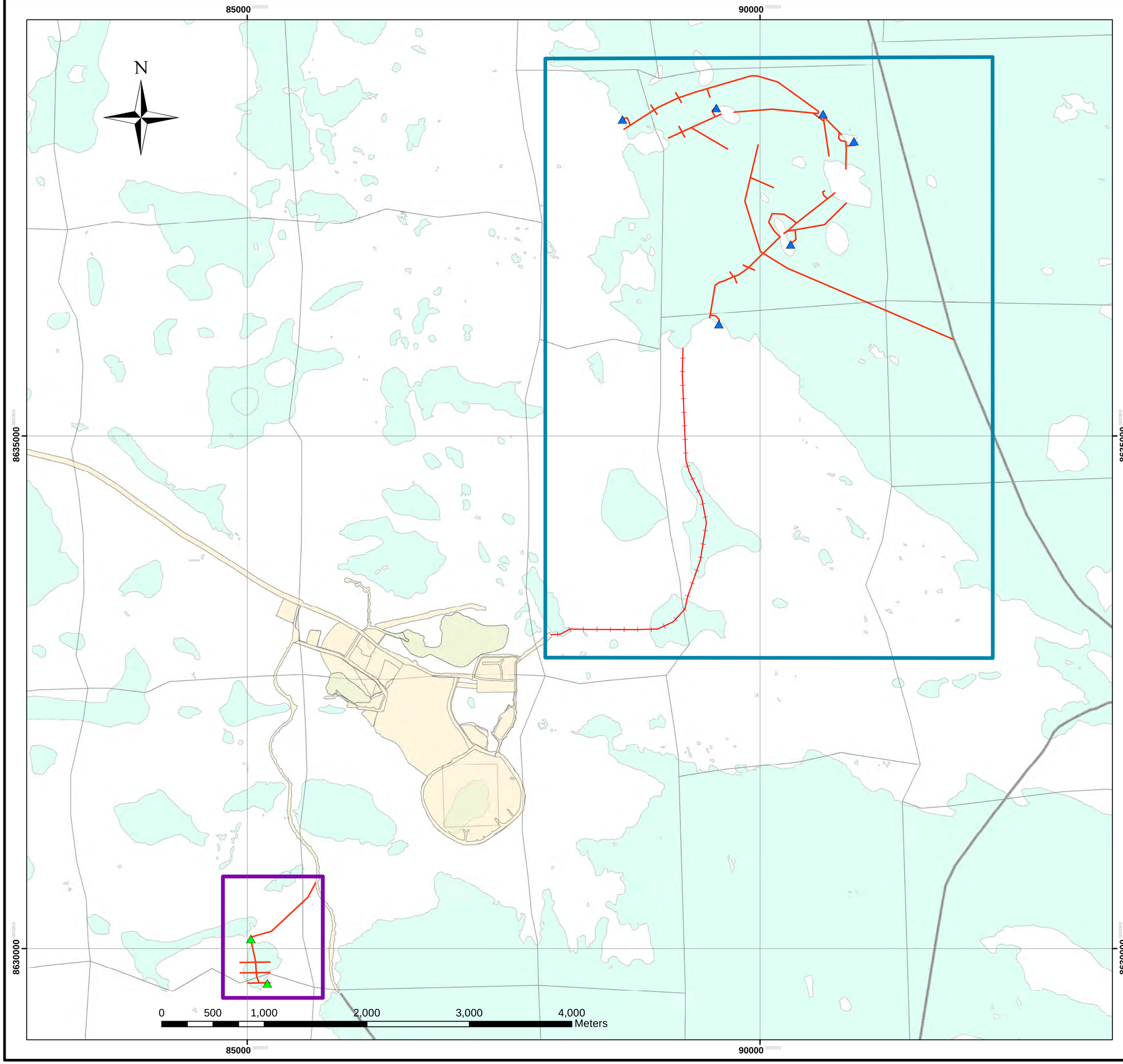
Created by : K. Ferguson
FOR: Dominion Diamond Ekati Corporation

Date: 8/26/2014

DOMINION DIAMOND

Item 2. Jay Island Thermistor Photos and Location Map





Legend

Jay

- thermistor

Lynx

- thermistor
- Lynx Work Area
- Misery to LdS Winter Trail
- Jay Work Area
- Lynx Access
- Jay Drilling Access
- Winter Road
- Ekati and Misery Sites
- Ekati Claim Block
- LAKE

Coordinate System: NAD 1983 Northwest Territories Lambert
Projection: Lambert Conformal Conic
Datum: North American 1983
False Easting: 0.0000
False Northing: 0.0000
Central Meridian: -112.0000
Standard Parallel 1: 62.0000
Standard Parallel 2: 70.0000
Latitude Of Origin: 0.0000
Units: Meter

Thermistor Locations Jay and Lynx Winter 2015 Ekati Minesite

Created by : K. Ferguson
FOR: Dominion Diamond Ekati Corporation

Date: 10/27/2014

DOMINION DIAMOND

HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: **BENTONITE**

Revision Date: 20-Nov-2012

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: BENTONITE
Synonyms: None
Chemical Family: Mineral
Application: Weight Additive

Manufacturer/Supplier
Halliburton Energy Services, Inc.
P.O. Box 1431
Duncan, Oklahoma 73536-0431
Emergency Telephone: (281) 575-5000

Prepared By
Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substances	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Bentonite	1302-78-9	60 - 100%	Not applicable	Not applicable
Crystalline silica, cristobalite	14464-46-1	0 - 1%	0.025 mg/m^3	1/2 x $\frac{10 \text{ mg/m}^3}{\%SiO2 + 2}$
Crystalline silica, tridymite	15468-32-3	0 - 1%	0.05 mg/m^3	1/2 x $\frac{10 \text{ mg/m}^3}{\%SiO2 + 2}$
Crystalline silica, quartz	14808-60-7	< 3	0.025 mg/m^3	$\frac{10 \text{ mg/m}^3}{\%SiO2 + 2}$

More restrictive exposure limits may be enforced by some states, agencies, or other authorities.

3. HAZARDS IDENTIFICATION

Hazard Overview

CAUTION! - ACUTE HEALTH HAZARD
May cause eye and respiratory irritation.

DANGER! - CHRONIC HEALTH HAZARD
Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposures below recommended exposure limits. Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product. Review the Material Safety Data Sheet (MSDS) for this product, which has been provided to your employer.

4. FIRST AID MEASURES

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Ingestion	Under normal conditions, first aid procedures are not required.
Notes to Physician	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (F):	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

Fire Extinguishing Media	All standard firefighting media.
Special Exposure Hazards	Not applicable.
Special Protective Equipment for Fire-Fighters	Not applicable.
NFPA Ratings:	Health 0, Flammability 0, Reactivity 0
HMIS Ratings:	Health 0*, Flammability 0, Reactivity 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures	Use appropriate protective equipment. Avoid creating and breathing dust.
Environmental Precautionary Measures	None known.
Procedure for Cleaning / Absorption	Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. HANDLING AND STORAGE

Handling Precautions	This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet.
Storage Information	Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Do not reuse empty container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits listed in Section 2.
Respiratory Protection	Wear a NIOSH certified, European Standard EN 149 (FFP2/FFP3), or equivalent respirator when using this product.
Hand Protection	Normal work gloves.
Skin Protection	Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Color:	Various
Odor:	Odorless
pH:	9.9
Specific Gravity @ 20 C (Water=1):	2.65
Density @ 20 C (lbs./gallon):	Not Determined
Bulk Density @ 20 C (lbs/ft3):	60
Boiling Point/Range (F):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (F):	Not Determined
Freezing Point/Range (C):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Insoluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Hydrofluoric acid.
Hazardous Decomposition Products	Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure Eye or skin contact, inhalation.

Inhalation Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A).

Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below).

Skin Contact May cause mechanical skin irritation.

Eye Contact May cause eye irritation.

Ingestion None known

Aggravated Medical Conditions Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to quartz dust.

Chronic Effects/Carcinogenicity Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.

Other Information For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768 (1997).

Toxicity Tests

Oral Toxicity: Not determined

Dermal Toxicity: Not determined

Inhalation Toxicity: Not determined

Primary Irritation Effect:	Not determined
Carcinogenicity	Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997).
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air) Not determined

Persistence/Degradability Not determined

Bio-accumulation Not determined

Ecotoxicological Information

Acute Fish Toxicity:	Not determined
Acute Crustaceans Toxicity:	Not determined
Acute Algae Toxicity:	Not determined

Chemical Fate Information Not determined

Other Information Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Bury in a licensed landfill according to federal, state, and local regulations.

Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT
Not restricted

Canadian TDG
Not restricted

ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory	All components listed on inventory or are exempt.
EPA SARA Title III Extremely Hazardous Substances	Not applicable
EPA SARA (311,312) Hazard Class	Acute Health Hazard Chronic Health Hazard
EPA SARA (313) Chemicals	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).
EPA CERCLA/Superfund Reportable Spill Quantity	Not applicable.
EPA RCRA Hazardous Waste Classification	If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.
California Proposition 65	The California Proposition 65 regulations apply to this product.
MA Right-to-Know Law	One or more components listed.
NJ Right-to-Know Law	One or more components listed.
PA Right-to-Know Law	One or more components listed.

Canadian Regulations

Canadian DSL Inventory	All components listed on inventory or are exempt.
WHMIS Hazard Class	D2A Very Toxic Materials Crystalline silica

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

Additional Information	For additional information on the use of this product, contact your local Halliburton representative. For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.
Disclaimer Statement	This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

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

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: (see Section 16 for Synonyms) **DIESEL, MINES SPECIAL-LS (DYED OR CLEAR)**
Product Description: Hydrocarbons and Additives
MSDS Number: 5487
Intended Use: Fuel

COMPANY IDENTIFICATION

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

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

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

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

Name	CAS#	Concentration*	Acute Toxicity
KEROSENE, STRAIGHT RUN	8008-20-6	0 - 100%	Dermal Lethality: LD50 > 2000 mg/kg (Rabbit); Inhalation Lethality: LC50 > 5.0 mg/l (Rat); Oral Lethality: LD50 > 5000 mg/kg (Rat)
LIGHT ATMOSPHERIC GAS OIL	64741-44-2	0 - 100%	None
LIGHT HYDROCRACKED DISTILLATE (PETROLEUM)	64741-77-1	0 - 100%	None

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

Name	CAS#	Concentration*	Acute Toxicity
NAPHTHALENE	91-20-3	< 1%	Dermal Lethality: LD50 > 20 g/kg (Rabbit); Oral Lethality: LD50 0.49 g/kg (Rat)

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

SECTION 3 HAZARDS IDENTIFICATION

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

PHYSICAL/CHEMICAL EFFECTS

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

HEALTH EFFECTS

Irritating to skin. If swallowed, may be aspirated and cause lung damage. May be irritating to the eyes, nose,

throat, and lungs. Breathing of high vapour concentrations may cause dizziness, light-headedness, headache, nausea and loss of co-ordination. Continued inhalation may result in unconsciousness. May cause central nervous system depression. High-pressure injection under skin may cause serious damage.

Target Organs: Skin |

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

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

SECTION 4 FIRST AID MEASURES

INHALATION

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

SKIN CONTACT

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

EYE CONTACT

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

INGESTION

Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN

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

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

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

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

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

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed

spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

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

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

FLAMMABILITY PROPERTIES

Flash Point [Method]: >52C (126F) [ASTM D-93]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

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

PROTECTIVE MEASURES

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

SPILL MANAGEMENT

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

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

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

ENVIRONMENTAL PRECAUTIONS

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

SECTION 7 HANDLING AND STORAGE

HANDLING

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

Static Accumulator: This material is a static accumulator.

STORAGE

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

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Substance Name	Form	Limit/Standard			Note	Source
KEROSENE, STRAIGHT RUN	Stable Aerosol.	TWA	5 mg/m3			Supplier
KEROSENE, STRAIGHT RUN	Vapour.	TWA	200 mg/m3			Supplier
KEROSENE, STRAIGHT RUN [as total hydrocarbon vapor]	Non-Aerosol	TWA	200 mg/m3		Skin	ACGIH
LIGHT ATMOSPHERIC GAS OIL	Stable Aerosol.	TWA	5 mg/m3			Supplier
LIGHT ATMOSPHERIC GAS OIL	Vapour.	TWA	200 mg/m3			Supplier
LIGHT HYDROCRACKED DISTILLATE (PETROLEUM)	Stable Aerosol.	TWA	5 mg/m3			Supplier
LIGHT HYDROCRACKED DISTILLATE (PETROLEUM)	Vapour.	TWA	200 mg/m3			Supplier
NAPHTHALENE		STEL	15 ppm		Skin	ACGIH
NAPHTHALENE		TWA	10 ppm		Skin	ACGIH

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

ENGINEERING CONTROLS

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

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

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use

with this material, as provided below, is based upon intended, normal usage.

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

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

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

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

Chemical resistant gloves are recommended.

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

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

Chemical/oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

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

GENERAL INFORMATION

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

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.84
Flash Point [Method]: >52C (126F) [ASTM D-93]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D
Boiling Point / Range: 180C (356F) - 325C (617F)
Vapour Density (Air = 1): N/D
Vapour Pressure: [N/D at 20°C] | 4 kPa (30 mm Hg) at 38C

Evaporation Rate (n-butyl acetate = 1): < 1
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): N/D
Solubility in Water: Negligible
Viscosity: 1.95 cSt (1.95 mm2/sec) at 40°C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

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

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

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

MATERIALS TO AVOID: Strong oxidizers

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

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m3	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Moderately irritating to skin with prolonged exposure. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

For the product itself:

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

vomiting may cause chemical pneumonitis or pulmonary edema.

Contains:

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

Additional information is available by request.

CMR Status:

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

--REGULATORY LISTS SEARCHED--

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

SECTION 12 ECOLOGICAL INFORMATION

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

ECOTOXICITY

Material -- Expected to be toxic to aquatic organisms.

MOBILITY

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

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

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Majority of components -- Expected to be inherently biodegradable

Atmospheric Oxidation:

More volatile component -- Expected to degrade rapidly in air

BIOACCUMULATION POTENTIAL

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

SECTION 13 DISPOSAL CONSIDERATIONS

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

DISPOSAL RECOMMENDATIONS

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

REGULATORY DISPOSAL INFORMATION

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

SECTION 14 TRANSPORT INFORMATION

LAND (TDG)

Proper Shipping Name: FUEL OIL
Hazard Class & Division: 3
UN Number: 1202
Packing Group: III

LAND (DOT)

Proper Shipping Name: DIESEL FUEL
Hazard Class & Division: 3
ID Number: 1993
Packing Group: III
ERG Number: 128
Label(s): None
Transport Document Name: UN1993, DIESEL FUEL, 3, PG III

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

SEA (IMDG)

Proper Shipping Name: HEATING OIL, LIGHT
Hazard Class & Division: 3
EMS Number: F-E, S-E
UN Number: 1202
Packing Group: III

Label(s): 3
Transport Document Name: UN1202, HEATING OIL, LIGHT, 3, PG III, (52°C c.c.)

AIR (IATA)

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

SECTION 15 REGULATORY INFORMATION

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

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

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

Complies with the following national/regional chemical inventory requirements: TSCA, DSL

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
NAPHTHALENE	91-20-3	1, 5, 6

--REGULATORY LISTS SEARCHED--

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

SECTION 16 OTHER INFORMATION

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

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:
Section 06: Protective Measures was modified.
Section 11: Acute Toxicity Table Header was modified.
Section 09: Phys/Chem Properties Note was modified.
Section 09: Colour was modified.
Section 09: Physical State was modified.
Section 11: Ingestion Acute Lethality - Header was modified.
Section 11: Inhalation - Header was modified.
Section 09: Evaporation Rate - Header was modified.

Section 07: Handling and Storage-Storage was modified.
Section 07: Handling and Storage-Handling was modified.
Section 07: Handling and Storage-Storage Phrases was modified.
Hazard Identification: Physical/Chemical Hazard was modified.
Section 11: Inhalation Lethality Test Data was modified.
Section 05: Hazardous Combustion Products was modified.
Section 09: Flash Point C(F) was modified.
Section 09 Viscosity was modified.
Section 04: First Aid Pre-existing Medical Conditions was modified.
Section 14: Label(s) - Header was modified.
Section 15: National Chemical Inventory Listing - Header was modified.
Hazard Identification: Hazards Note was modified.
Section 16: CA Prepared by - Header was modified.
Composition: Component table was modified.
Section 08: Exposure Limits Table was modified.
Section 16: Physical Hazards additional was modified.
Section 16: Precautions was modified.
Section 16: Precautionary Label Text - Header was modified.
Section 09: Oxidizing Properties was modified.
Section 15: Canadian List Citations Table was modified.
Section 01: Company Contact Methods Sorted by Priority was modified.
Section 11: Tox List Cited Table was modified.
Section 11: Chronic Tox - Component - WHMIS was modified.

SYNONYMS: DIESEL MINES (DYED OR CLEAR), MINES DIESEL FUEL (DYED OR CLEAR), ESSO MINES DIESEL FUEL (DYED OR CLEAR), DIESEL LS SASK MINE 52FP

PRECAUTIONARY LABEL TEXT:

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

HEALTH HAZARDS

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

Target Organs: Skin |

PHYSICAL HAZARDS

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

PRECAUTIONS

Avoid contact with skin. Use only with adequate ventilation. Use proper bonding and/or earthing procedures.However, bonding and earthing may not eliminate the hazard from static accumulation.

FIRST AID

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

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

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

few hours may significantly reduce the ultimate extent of injury.

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

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

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

DGN: 5005530 (1015132)

Prepared by: Imperial Oil Limited, IH and Product Safety

MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**Gasoline**
Version #	01
Issue date	07-19-2012
Revision date	-
Supersedes date	-
CAS #	86290-81-5
Product code	695
Product use	Motor fuels.
Manufacturer information	
Manufacturer	Consumers' Co-operative Refineries Limited
Address	P.O. Box 260; 9th Avenue North Regina, SK S4P 3A1 Canada
Telephone	(306) 721-5353
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. Hazards Identification

Physical state	Liquid.
Appearance	Amber liquid.
Emergency overview	DANGER! Extremely flammable liquid and vapor - vapor may cause flash fire or explosion. Harmful if inhaled, absorbed through skin, or swallowed. Aspiration may cause lung damage. Irritating to eyes, respiratory system and skin. In high concentrations, vapors and spray mists are narcotic and may cause headache, fatigue, dizziness and nausea. Cancer hazard. May cause heritable genetic damage. Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment. Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Inhalation. Ingestion. Skin contact. Eye contact.
Eyes	Contact may irritate or burn eyes. Eye contact may result in corneal injury.
Skin	Harmful if absorbed through skin. Irritating to skin. Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.
Inhalation	Harmful if inhaled. Irritating to respiratory system. In high concentrations, vapors and spray mists are narcotic and may cause headache, fatigue, dizziness and nausea. May cause breathing disorders and lung damage. May cause cancer by inhalation. Prolonged inhalation may be harmful.
Ingestion	Harmful if swallowed. Ingestion may result in vomiting; aspiration (breathing) of vomitus into lungs must be avoided as even small quantities may result in aspiration pneumonitis. Irritating to mouth, throat, and stomach.
Target organs	Blood. Eyes. Liver. Respiratory system. Skin. Kidneys. Central nervous system.
Chronic effects	Cancer hazard. Contains material which may have reproductive toxicity, teratogenetic or mutagenic effects. Liver injury may occur. Kidney injury may occur. May cause central nervous system disorder (e.g., narcosis involving a loss of coordination, weakness, fatigue, mental confusion and blurred vision) and/or damage. Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

Signs and symptoms Irritation of nose and throat. Irritation of eyes and mucous membranes. Skin irritation. Unconsciousness. Corneal damage. Narcosis. Cyanosis (blue tissue condition, nails, lips, and/or skin). Decrease in motor functions. Behavioral changes. Edema. Liver enlargement. Jaundice. Conjunctivitis. Proteinuria. Defatting of the skin. Rash.

Potential environmental effects Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Gasoline	86290-81-5	60-100
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

First aid procedures

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention.

Skin contact Remove contaminated clothing and shoes. Wash off immediately with soap and plenty of water. Get medical attention if irritation develops or persists. Wash clothing separately before reuse. Destroy or thoroughly clean contaminated shoes.

Inhalation Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention if discomfort develops or persists.

Ingestion Rinse mouth thoroughly. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content does not get into the lungs. Get medical attention immediately.

Notes to physician In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General advice If exposed or concerned: get medical attention/advice. 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 re-use.

5. Fire Fighting Measures

Flammable properties Extremely flammable liquid and vapor - vapor may cause flash fire.

Extinguishing media

Suitable extinguishing media Water. Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media Do not use a solid water stream as it may scatter and spread fire.

Protection of firefighters

Specific hazards arising from the chemical Vapor may cause flash fire. Vapors can flow along surfaces to distant ignition source and flash back. Sensitive to static discharge.

Protective equipment and precautions for firefighters Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

Fire fighting equipment/instructions Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Withdraw immediately in case of rising sound from venting safety devices or any discoloration of tanks due to fire. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Move containers from fire area if you can do it without risk. In the event of fire, cool tanks with water spray. Cool containers exposed to flames with water until well after the fire is out. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Vapors may form explosive air mixtures even at room temperature. Prevent buildup of vapors or gases to explosive concentrations. Some of these materials, if spilled, may evaporate leaving a flammable residue. Water runoff can cause environmental damage.

Specific methods In the event of fire and/or explosion do not breathe fumes. Use water spray to cool unopened containers.

Hazardous combustion products Carbon monoxide. Carbon Dioxide. Sulfur oxides. Nitrogen oxides (NOx). Hydrocarbons.

6. Accidental Release Measures

Personal precautions

Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. See Section 8 of the MSDS for Personal Protective Equipment.

Environmental precautions

If facility or operation has an "oil or hazardous substance contingency plan", activate its procedures. Stay upwind and away from spill. Wear appropriate protective equipment including respiratory protection as conditions warrant. Do not enter or stay in area unless monitoring indicates that it is safe to do so. Isolate hazard area and restrict entry to emergency crew. Flammable. Review Firefighting Measures, Section 5, before proceeding with clean up. Keep all sources of ignition (flames , smoking, flares, etc.) and hot surfaces away from release. Contain spill in smallest possible area. Recover as much product as possible (e.g. by vacuuming). Stop leak if it can be done without risk. Use water spray to disperse vapors. Spilled material may be absorbed by an appropriate absorbent, and then handled in accordance with environmental regulations. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment or drainage systems and natural waterways. Contact fire authorities and appropriate federal, state and local agencies. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, contact the National Response Center at 1-800-424-8802. For highway or railways spills, contact Chemtrec at 1-800-424-9300.

Methods for containment

Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Stop leak if you can do so without risk. This material is a water pollutant and should be prevented from contaminating soil or from entering sewage and drainage systems and bodies of water. Dike the spilled material, where this is possible. Prevent entry into waterways, sewers, basements or confined areas.

Methods for cleaning up

Small Spills: Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. This material and its container must be disposed of as hazardous waste.

Large Spills: Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Prevent product from entering drains. Do not allow material to contaminate ground water system. Should not be released into the environment.

Other information

Clean up in accordance with all applicable regulations.

7. Handling and Storage

Handling

Wear personal protective equipment. Do not breathe dust/fume/gas/mist/vapors/spray. Avoid contact with eyes, skin, and clothing. Do not taste or swallow. Avoid prolonged exposure. Use only with adequate ventilation. Wash thoroughly after handling. The product is flammable, and heating may generate vapors which may form explosive vapor/air mixtures. DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. When using, do not eat, drink or smoke. Avoid release to the environment.

Storage

Flammable liquid storage. Do not handle or store near an open flame, heat or other sources of ignition. This material can accumulate static charge which may cause spark and become an ignition source. The pressure in sealed containers can increase under the influence of heat. Keep container tightly closed in a cool, well-ventilated place. Keep away from food, drink and animal feedingstuffs. Keep out of the reach of children.

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
Gasoline (CAS 86290-81-5)	STEL	500 ppm
	TWA	300 ppm

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	5 ppm
	TWA	1 ppm

US. OSHA Table Z-2 (29 CFR 1910.1000)

Components	Type	Value
Benzene (CAS 71-43-2)	Ceiling	25 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
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
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
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

Mexico. Occupational Exposure Limit Values

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	16 mg/m3
		5 ppm
	TWA	3.2 mg/m3
		1 ppm

Engineering controls Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Use explosion-proof equipment.

Personal protective equipment

Eye / face protection Wear safety glasses. If splash potential exists, wear full face shield or chemical goggles.

Skin protection Wear chemical-resistant, impervious gloves. Neoprene or nitrile gloves are recommended. Full body suit and boots are recommended when handling large volumes or in emergency situations. Flame retardant protective clothing is recommended.

Respiratory protection Wear a NIOSH-approved (or equivalent) full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

General hygiene considerations Avoid contact with skin. Keep away from food and drink. Provide eyewash station and safety shower. Handle in accordance with good industrial hygiene and safety practice.

9. Physical & Chemical Properties

Appearance Amber liquid.

Physical state Liquid.

Form Liquid.

Color Amber.

Odor Gasoline-like.

Odor threshold < 0.25 ppm

pH Not available.

Vapor pressure > 1 (Air=1)

Vapor density 3 - 4 (Air=1)

Boiling point 77 - 392 °F (25 - 200 °C)

Melting point/Freezing point	Not available.
Solubility (water)	Insoluble
Specific gravity	0.69 - 0.75
Flash point	< -40 °F (< -40 °C) Closed Cup
Flammability limits in air, upper, % by volume	7.1 %
Flammability limits in air, lower, % by volume	1.2 %
Auto-ignition temperature	842 °F (450 °C)
VOC	100 %
Evaporation rate	4 (Butyl acetate = 1)

10. Chemical Stability & Reactivity Information

Chemical stability	Stable under normal temperature conditions and recommended use.
Conditions to avoid	Heat, flames and sparks. Ignition sources. 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	Carbon monoxide. Carbon dioxide. Sulfur oxides. Hydrocarbons.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Sensitization This substance may have a potential for sensitization which may provoke an allergic reaction among sensitive individuals.

Acute effects Harmful if inhaled, absorbed through skin, or swallowed. Harmful: may cause lung damage if swallowed. Irritating to eyes, respiratory system and skin. In high concentrations, vapors and spray mists are narcotic and may cause headache, fatigue, dizziness and nausea.

Local effects

US. ACGIH Threshold Limit Values

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

Chronic effects Prolonged and repeated exposure to benzene may cause serious injury to blood forming organs and is associated with anemia and to the later development of acute myelogenous leukemia (AML). Danger of serious damage to health by prolonged exposure. Prolonged or repeated overexposure may cause central nervous system, kidney, liver, and lung damage.

Subchronic effects Subchronic inhalation of benzene by rats produced decreased white blood cell counts, decreased bone marrow cell activity, increased red blood cell activity and cataracts. Blood disorders may occur after prolonged inhalation, prolonged skin contact and/or ingestion. Liver and kidney damage may occur after prolonged and repeated exposure.

Carcinogenicity Cancer hazard. Contains benzene, a classified IARC 1 chemical (Known Human Carcinogen).

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.

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.

US NTP Report on Carcinogens: Known carcinogen

Benzene (CAS 71-43-2)	Known To Be Human Carcinogen.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Benzene (CAS 71-43-2)	Cancer hazard.

Epidemiology Contains benzene. Human epidemiology studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-producing system and serious blood disorders, including leukemia. Animal tests suggest that prolonged and/or repeated overexposure to benzene may damage the embryo/fetus. The relevance of these animal studies to humans has not been fully established.

Mutagenicity May cause heritable genetic damage.

Neurological effects Central and/or peripheral nervous system damage. May cause central nervous system disorder (e.g., narcosis involving a loss of coordination, weakness, fatigue) and/or damage.

Reproductive effects Animal studies of benzene have shown testicular effects, alterations in reproductive cycles, chromosomal aberrations and embryo/fetotoxicity. May damage fertility or the unborn child. Can cause adverse reproductive effects - such as birth defects, miscarriages, or infertility. Avoid exposure to women during early pregnancy. Avoid contact during pregnancy/while nursing.

Further information Symptoms may be delayed.

12. Ecological Information

Ecotoxicological data

Components		Species	Test Results
Benzene (CAS 71-43-2)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	8.76 - 15.6 mg/l, 48 hours
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	5.3 mg/l, 96 hours

Ecotoxicity Contains a substance which causes risk of hazardous effects to the environment.

Environmental effects The product contains a substance which is toxic to aquatic organisms and which may cause long-term adverse effects in the aquatic environment.

Aquatic toxicity Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

Persistence and degradability Not available.

Bioaccumulation / Accumulation Not available.

Partition coefficient

Benzene	2.13

13. Disposal Considerations

Waste codes D001: Waste Flammable material with a flash point <140 °F
D018: Waste Benzene

Disposal instructions Dispose in accordance with all applicable regulations. Dispose of this material and its container to hazardous or special waste collection point. Incinerate the material under controlled conditions in an approved incinerator. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container.

14. Transport Information

DOT

Basic shipping requirements:

UN number	UN1203
Proper shipping name	Gasoline, MARINE POLLUTANT
Hazard class	3
Packing group	II
Environmental hazards	
Marine pollutant	Yes
Additional information:	
Special provisions	144, 177, B1, B33, IB2, T4, TP1
Packaging exceptions	150
Packaging non bulk	202
Packaging bulk	242

IATA

UN number	UN1203
UN proper shipping name	Gasoline
Transport hazard class(es)	3
Packing group	II
Environmental hazards	Yes
ERG code	3H

IMDG

UN number	UN1203

UN proper shipping name	GASOLINE, MARINE POLLUTANT
Transport hazard class(es)	3
Packing group	II
Environmental hazards	
Marine pollutant	Yes
EmS No.	F-E, S-E

TDG

Proper shipping name	GASOLINE, MARINE POLLUTANT
Hazard class	3
UN number	UN1203
Packing group	II
Marine pollutant	Yes
Special provisions	17, 82, 88

15. Regulatory Information

US federal regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Benzene (CAS 71-43-2)

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

Benzene (CAS 71-43-2)	0.1 %

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

Benzene (CAS 71-43-2)	Listed.

CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)

Gasoline: 100
Benzene: 10

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No
Section 302 extremely hazardous substance (40 CFR 355, Appendix A)	No
Section 311/312 (40 CFR 370)	Yes
Drug Enforcement Administration (DEA) (21 CFR 1308.11-15)	Not controlled
WHMIS status	Controlled
WHMIS classification	B2 - Flammable Liquids D2A - Other Toxic Effects-VERY TOXIC D2B - Other Toxic Effects-TOXIC

WHMIS labeling

Inventory status

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

Country(s) or region	Inventory name	On inventory (yes/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)

State regulations

US - California Hazardous Substances (Director's): Listed substance

Benzene (CAS 71-43-2) Listed.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Benzene (CAS 71-43-2) Listed.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

Benzene (CAS 71-43-2) Listed: February 27, 1987 Carcinogenic.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

Benzene (CAS 71-43-2) Listed: December 26, 1997 Developmental toxin.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

Benzene (CAS 71-43-2) Listed: December 26, 1997 Male reproductive toxin.

US - New Jersey RTK - Substances: Listed substance

Benzene (CAS 71-43-2) Listed.

US - Pennsylvania RTK - Hazardous Substances: Special hazard

Benzene (CAS 71-43-2) Special hazard.

US. Massachusetts RTK - Substance List

Benzene (CAS 71-43-2) Listed.

US. New Jersey Worker and Community Right-to-Know Act

Benzene (CAS 71-43-2) 500 LBS

US. Pennsylvania RTK - Hazardous Substances

Benzene (CAS 71-43-2) Listed.
Gasoline (CAS 86290-81-5) Listed.

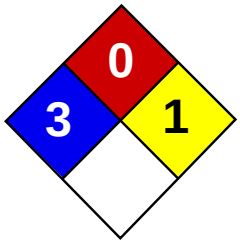
16. Other Information

Further information HMIS® is a registered trade and service mark of the NPCA.

HMIS® ratings
Health: 2*
Flammability: 4
Physical hazard: 0

NFPA ratings
Health: 2
Flammability: 4
Instability: 0

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
Hydrochloric acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: Hydrochloric acid

Catalog Codes: SLH1462, SLH3154

CAS#: Mixture.

RTECS: MW4025000

TSCA: TSCA 8(b) inventory: Hydrochloric acid

CI#: Not applicable.

Synonym: Hydrochloric Acid; Muriatic Acid

Chemical Name: Not applicable.

Chemical Formula: Not applicable.

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Hydrogen chloride	7647-01-0	20-38
Water	7732-18-5	62-80

Toxicological Data on Ingredients: Hydrogen chloride: GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth. Repeated or prolonged exposure to the substance can produce target

organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: of metals

Explosion Hazards in Presence of Various Substances: Non-explosive in presence of open flames and sparks, of shocks.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
Non combustible. Calcium carbide reacts with hydrogen chloride gas with incandescence. Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine. Rubidium acetylene carbides burns with slightly warm hydrochloric acid. Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas spontaneously flammable in air is evolved. Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammble gas. Cesium acetylene carbide burns hydrogen chloride gas. Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute. Reacts with most metals to produce flammable Hydrodgen gas.

Special Remarks on Explosion Hazards:

Hydrogen chloride in contact with the following can cause an explosion, ignition on contact, or other violent/vigorous reaction: Acetic anhydride AgClO + CCl4 Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium hydroxide, Calcium carbide Ca3P2 Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylene diamine Ethylene imine, Fluorine, HClO4 Hexalithium disilicide H2SO4 Metal acetylides or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U3P4 , Vinyl acetate. Silver perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:
Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, organic materials, metals, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

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

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
CEIL: 5 (ppm) from OSHA (PEL) [United States] CEIL: 7 (mg/m3) from OSHA (PEL) [United States] CEIL: 5 from NIOSH CEIL: 7 (mg/m3) from NIOSH TWA: 1 STEL: 5 (ppm) [United Kingdom (UK)] TWA: 2 STEL: 8 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Pungent. Irritating (Strong.)

Taste: Not available.

Molecular Weight: Not applicable.

Color: Colorless to light yellow.

pH (1% soln/water): Acidic.

Boiling Point:
108.58 C @ 760 mm Hg (for 20.22% HCl in water) 83 C @ 760 mm Hg (for 31% HCl in water) 50.5 C (for 37% HCl in water)

Melting Point:
-62.25°C (-80°F) (20.69% HCl in water) -46.2 C (31.24% HCl in water) -25.4 C (39.17% HCl in water)

Critical Temperature: Not available.

Specific Gravity:
1.1- 1.19 (Water = 1) 1.10 (20%and 22% HCl solutions) 1.12 (24% HCl solution) 1.15 (29.57% HCl solution) 1.16 (32% HCl solution) 1.19 (37% and 38%HCl solutions)

Vapor Pressure: 16 kPa (@ 20°C) average

Vapor Density: 1.267 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.25 to 10 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility: Soluble in cold water, hot water, diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, water

Incompatibility with various substances:
Highly reactive with metals. Reactive with oxidizing agents, organic materials, alkalis, water.

Corrosivity:
Extremely corrosive in presence of aluminum, of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Reacts with water especially when water is added to the product. Absorption of gaseous hydrogen chloride on mercuric sulfate becomes violent @ 125 deg. C. Sodium reacts very violently with gaseous hydrogen chloride. Calcium phosphide and hydrochloric acid undergo very energetic reaction. It reacts with oxidizers releasing chlorine gas. Incompatible with, alkali metals, carbides, borides, metal oxides, vinyl acetate, acetylides, sulphides, phosphides, cyanides, carbonates. Reacts with most metals to produce flammable Hydrogen gas. Reacts violently (moderate reaction with heat of evolution) with water especially when water is added to the product. Isolate hydrogen chloride from heat, direct sunlight, alkalies (reacts vigorously), organic materials, and oxidizers (especially nitric acid and chlorates), amines, metals, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure) Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid. Adsorption of Hydrochloric Acid onto silicon dioxide results in exothmeric reaction. Hydrogen chloride causes aldehydes and epoxides to violently polymerize. Hydrogen chloride or Hydrochloric Acid in contact with the folloiwng can cause explosion or ignition on contact or

Special Remarks on Corrosivity:

Highly corrosive. Incompatible with copper and copper alloys. It attacks nearly all metals (mercury, gold, platinium, tantalum, silver, and certain alloys are exceptions). It is one of the most corrosive of the nonoxidizing acids in contact with copper alloys. No corrosivity data on zinc, steel. Severe Corrosive effect on brass and bronze

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
Acute oral toxicity (LD50): 900 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1108 ppm, 1 hours [Mouse]. Acute toxicity of the vapor (LC50): 3124 ppm, 1 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. May cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth.

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of ingestion, . Hazardous in case of eye contact (corrosive), of inhalation (lung corrosive).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Doses (LDL/LCL) LDL [Man] -Route: Oral; 2857 ug/kg LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects (fetoxicity). May affect genetic material.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Corrosive. Causes severe skin irritation and burns. Eyes: Corrosive. Causes severe eye irritation/conjuntivitis, burns, corneal necrosis. Inhalation: May be fatal if inhaled. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation of hydrochloric acid fumes produces nose, throat, and larryngeal burning, and irritation, pain and inflammation, coughing, sneezing, choking sensation, hoarseness, laryngeal spasms, upper respiratory tract edema, chest pains, as well has headache, and palpitations. Inhalation of high concentrations can result in corrosive burns, necrosis of bronchial epithelium, constriction of the larynx and bronchi, nasospetal perforation, glottal closure, occur, particularly if exposure is prolonged. May affect the liver. Ingestion: May be fatal if swallowed. Causes irritation and burning, ulceration, or perforation of the gastrointestinal tract and resultant peritonitis, gastric hemorrhage and infection. Can also cause nausea, vomitting (with "coffee ground" emesis), diarrhea, thirst, difficulty swallowing, salivation, chills, fever, uneasiness, shock, strictures and stenosis (esophogeal, gastric, pyloric). May affect behavior (excitement), the cardiovascular system (weak rapid pulse, tachycardia), respiration (shallow respiration), and urinary system (kidneys- renal failure, nephritis). Acute exposure via inhalation or ingestion can also cause erosion of tooth enamel. Chronic Potential Health Effects: dyspnea, bronchitis. Chemical pneumonitis and pulmonary edema can also

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Hydrochloric acid, solution UNNA: 1789 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Hydrochloric acid Illinois toxic substances disclosure to employee act: Hydrochloric acid Illinois chemical safety act: Hydrochloric acid New York release reporting list: Hydrochloric acid Rhode Island RTK hazardous substances: Hydrochloric acid Pennsylvania RTK: Hydrochloric acid Minnesota: Hydrochloric acid Massachusetts RTK: Hydrochloric acid Massachusetts spill list: Hydrochloric acid New Jersey: Hydrochloric acid New Jersey spill list: Hydrochloric acid Louisiana RTK reporting list: Hydrochloric acid Louisiana spill reporting: Hydrochloric acid California Director's List of Hazardous Substances: Hydrochloric acid TSCA 8(b) inventory: Hydrochloric acid TSCA 4(a) proposed test rules: Hydrochloric acid SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid SARA 313 toxic chemical notification and release reporting: Hydrochloric acid CERCLA: Hazardous substances.: Hydrochloric acid: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):
R34- Causes burns. R37- Irritating to respiratory system. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 1

Personal Protection:

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

Health: 3

Flammability: 0

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

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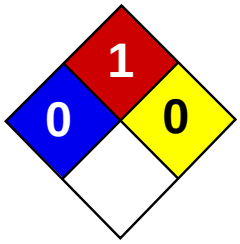

Material Safety Data Sheet
Propylene glycol MSDS

Section 1: Chemical Product and Company Identification

Product Name: Propylene glycol

Catalog Codes: SLP1162, SLP2974

CAS#: 57-55-6

RTECS: TY2000000

TSCA: TSCA 8(b) inventory: Propylene glycol

CI#: Not applicable.

Synonym: 1,2,-propanediol, 1,2-dihydroxypropane

Chemical Name: Propylene Glycol

Chemical Formula: CH3CHOHCH2OH

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Propylene glycol	57-55-6	100

Toxicological Data on Ingredients: Propylene glycol: ORAL (LD50): Acute: 20000 mg/kg [Rat]. 22000 mg/kg [Mouse]. DERMAL (LD50): Acute: 20800 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of ingestion. Slightly hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of inhalation.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

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. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 371°C (699.8°F)

Flash Points: CLOSED CUP: 99°C (210.2°F). OPEN CUP: 107°C (224.6°F) (Cleveland).

Flammable Limits: LOWER: 2.6% UPPER: 12.5%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Slightly flammable to flammable in presence of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: When heated to decomposition it emits acrid smoke and irritating fumes.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, acids, alkalis, moisture.

Storage:
Hygroscopic. Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 23°C (73.4°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 10 (mg/m3) from AIHA Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Oily liquid.)

Odor: Practically Odorless.

Taste: Practically Tasteless.

Molecular Weight: 76.1g/mole

Color: Colorless. Clear

pH (1% soln/water): Not available.

Boiling Point: 188°C (370.4°F)

Melting Point: -59°C (-74.2°F)

Critical Temperature: Not available.

Specific Gravity: 1.036 (Water = 1)

Vapor Pressure:
0 kPa (@ 20°C) 0.08 mmHg at 20 C 0.129 mmHg at 25 C

Vapor Density: 2.62 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: The product is more soluble in water; log(oil/water) = -0.9

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, acetone.

Solubility: Soluble in cold water, hot water, acetone.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, excess heat, exposure to moist air or water

Incompatibility with various substances: Reactive with oxidizing agents, reducing agents, acids, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Hygroscopic; keep container tightly closed. Incompatible with chloroformates, strong acids (nitric acid, hydrofluloric acid), caustics, aliphatic amines, isocyanates, strong oxidizers, acid anhydrides, silver nitrate, reducing agents.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact.

Toxicity to Animals:
Acute oral toxicity (LD50): 18500 mg/kg [Rabbit]. Acute dermal toxicity (LD50): 20800 mg/kg [Rabbit].

Chronic Effects on Humans: May cause damage to the following organs: central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of ingestion. Slightly hazardous in case of skin contact (irritant, permeator), of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May affect genetic material (mutagenic). May cause adverse reproductive effects and birth defects (teratogenic) based on animal test data.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: May cause mild skin irritation. It may be absorbed through the skin and cause systemic effects similar to those of ingestion. Eyes: May cause mild eye irritation with some immediate, transitory stinging, lacrimation, blepharospasm, and mild transient conjunctival hyperemia. There is no residual discomfort or injury once it is washed away. Inhalation: May cause respiratory tract irritation. Ingestion: It may cause gastrointestinal tract irritation. It may affect behavior/central nervous system(CNS depression, general anesthetic, convulsions, seizures, somnolence, stupor, muscle contraction or spasticity, coma), brain (changes in surface EEG), metabolism, blood (intravascular hemolysis, white blood cells - decreased neutrophil function), respiration (respiratory stimulation, chronic pulmonary edema, cyanosis), cardiovascular system(hypotension, bradycardia, arrhythmias, cardiac arrest), endocrine system (hypoglycemia), urinary system (kidneys), and liver. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may cause allergic contact dermatitis. Ingestion: Prolonged or repeated ingestion may cause hyperglycemia and may affect behavior/CNS (symptoms similar to that of acute ingestion). Inhalation: Prolonged or repeated inhalation may affect behavior/CNS (with symptoms similar to ingestion), and spleen

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): >5000 mg/l 24 hours [Goldfish]. >10000 mg/l 48 hours [guppy]. >10000 mg/l 48 hours [water flea].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: Propylene glycol Minnesota: Propylene glycol TSCA 8(b) inventory: Propylene glycol

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

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

DSCL (EEC):
R21/22- Harmful in contact with skin and if swallowed. S24/25- Avoid contact with skin and eyes.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: h

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

Health: 0

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Splash goggles.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Supplier MSDS -LOLI -RTECS -HSDB

Other Special Considerations: Not available.

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MATERIAL SAFETY DATA SHEET

Silica/Filter Sand

Section 01 - Product And Company Information

Product Identifier ..... Silica Sand, Filter Sand

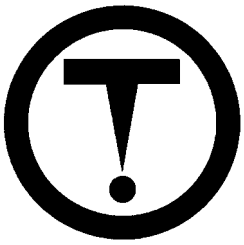
Product Use ..... Filter sand, foundry sand, glass sand, sandblasting sand, golf course sand, play sand, silica flour, sport surface, traction sand

Supplier Name..... ClearTech Industries Inc.
1500 Quebec Avenue
Saskatoon, SK. Canada
S7K 1V7

Prepared By..... ClearTech Industries Inc. Technical Department
Phone: (306)664-2522

Preparation Date..... December 6, 2012

24-Hour Emergency Phone..... 306-664-2522



Section 02 - Composition / Information on Ingredients

Hazardous Ingredients.....	Crystalline Silica	92-94%
	Aluminium Oxide	< 5%
	Iron Oxide	< 1%
	Titanium Oxide	< 0.09
CAS Number.....	Crystalline Silica	14808-60-7
	Aluminium Oxide	1344-28-1
	Iron Oxide	1309-37-1
	Titanium Oxide	13463-67-7

Synonym (s)..... Quartz, crystalline silica, silica dioxide, ground silica

Section 03 - Hazard Identification

Inhalation..... Respiratory diseases may develop such as silicosis, pneumoconiosis and pulmonary fibrosis from inhalation.

Skin Contact / Absorption..... Abrasions of the skin may develope from contact.

Eye Contact..... Crystalline silica (quartz) may cause abrasions to the cornea.

Ingestion..... No health effects are known.

Exposure Limits..... OSHA-PEL: 10mg/m^3
ACGIH: 0.05mg/m^3
NIOSH: 0.05mg/m^3

Section 04 - First Aid Measures

Inhalation..... Health effects associated with crystalline silica are chronic. If a massive amount of crystalline silica is inhaled, remove the person to fresh air, perform artificial respiration as needed, and obtain medical attention as needed.

Skin Contact / Absorption..... Remove contaminated clothing. Wash affected area with soap and water. Seek medical attention if irritation occurs or persists.

Eye Contact..... Do not rub eyes. Flush immediately with water for at least 20 minutes. Forcibly hold eyelids apart to ensure complete irrigation of eye tissue. Seek medical attention.

Ingestion..... Seek immediate medical attention if large amounts are ingested.

Additional Information..... Good personal hygiene is essential. Always wash your hands after handling crystalline silica, prior to handling food and/or drinkable liquids.

Section 05 - Fire Fighting Measures

Conditions of Flammability..... None

Means of Extinction..... Use extinguishing media appropriate for the surrounding fire.

Flash Point..... Not combustible

Auto-ignition Temperature..... None

Upper Flammable Limit ..... None

Lower Flammable Limit..... None

Hazardous Combustible Products.... None

Special Fire Fighting Procedures..... At extreme temperatures, calcium oxide fumes may evolve, wear NIOSH-approved self-contained breathing apparatus and protective clothing.

Explosion Hazards..... None

Section 06 - Accidental Release Measures

Leak / Spill..... Wear appropriate personal protective equipment if required (Section 8). Use dustless methods (vacuum) during clean up. Do not dry sweep. Wet down spilled material if sweeping is the most feasible method of clean up. Place the silica in a covered container appropriately designed for disposal. Dispose of the silica according to federal, state, provincial, and local regulations. Avoid release of product into waterways and/or sewers.

Deactivating Materials..... Not available

Section 07 - Handling and Storage

Handling Procedures..... Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure.

Storage Requirements..... No special storage requirements are needed other than keep away from incompatibles listed in Section 10.

Section 08 - Personal Protection and Exposure Controls

Protective Equipment

Eyes..... Chemical goggles, full-face shield, or a full-face respirator is to be worn at all times when product is handled. Contact lenses should not be worn; they may contribute to severe eye injury.

Respiratory..... Use only NIOSH approved respiratory protection equipment with a minimum N95 rating. Avoid breathing dust produced during the use of this and handling of this material. If the workplace airborne crystalline silica concentration is unknown for a given task, Air Quality Monitoring should be conducted in order to determine the appropriate level of respiratory protection. Ensure the appropriate respirators are worn during, and following the task, including clean up or whenever airborne dust is present, to insure ambient dust levels are below occupational exposure limits. Provisions should be made for a respiratory protection-training program.

Also see ANSI standard Z88.2 “American National Standard for Respiratory Protection”, or the CSA Standard Z94.4-02 “Selection, Use, And Care of Respirators.”

Gloves..... Impervious gloves of chemically resistant material should be worn. Wash contaminated clothing and dry thoroughly before reuse.

Clothing..... Body suits, aprons, and/or coveralls of chemical resistant material should be worn. Wash contaminated clothing and dry thoroughly before reuse.

Footwear..... No special footwear is required other than what is mandated at place of work.

Engineering Controls

Ventilation Requirements..... Mechanical ventilation (dilution or local exhaust), process or personnel enclosure and control of process conditions should be provided. Supply sufficient replacement air to make up for air removed by exhaust systems.

Other..... Keep an eye wash fountain and safety shower available and in close proximity to work area.

Section 09 - Physical and Chemical Properties

Physical State..... Solid

Odor and Appearance..... Odorless light to medium brown granular particles.

Odor Threshold..... Not applicable

Specific Gravity (Water=1)..... ~ 2.60

Vapor Pressure (mm Hg, 20°C)..... Not applicable

Vapor Density (Air=1)..... Not applicable

Evaporation Rate..... Not applicable

Boiling Point..... Not applicable

Freeze/Melting Point..... ~ 2,200°C

pH..... 7.3

Water/Oil Distribution Coefficient..... Not applicable

Bulk Density..... Not available

% Volatiles by Volume..... Not available

Solubility in Water..... Not applicable

Molecular Formula..... Not available

Molecular Weight..... Not available

Section 10 - Stability and Reactivity

Stability..... Stable

Incompatibility..... Contact with powerful oxidizing agents, such as fluorine, chlorine trifluoride and oxygen difluoride may cause fires.

Hazardous Products of Decomposition... Silica will dissolve in hydrofluoric acid and produce a corrosive gas, silicon tetrafuoride.

Polymerization..... Will not occur

Section 11 - Toxicological Information

Irritancy..... Mild irritant to skin and eyes, highly irritating with chronic exposure.

Sensitization..... Not available

Chronic/Acute Effects..... Acute:
One form of silicosis, acute silicosis, can occur with exposures to very concentrations of respirable crystalline silica over a short period of time, sometimes as short as a few months. The symptoms of acute silicosis includes progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

Chronic:
The various forms of chronic effects of silicosis include lung cancer, autoimmune and chronic kidney diseases, tuberculosis and non-malignant respiratory disease. The condition of individuals with lung disease (ie: bronchitis, emphysema, chronic obstructive pulmonary disease) can be aggravated by exposure.

Synergistic Materials..... Not available

Animal Toxicity Data..... No evidence to suggest that crystalline silica is toxic to birds or fish.

Carcinogenicity..... Overall evaluation by IARC is crystalline silica inhaled in the forms of quartz and cristobalite is considered a carcinogen to humnas. Crystalline silica is not regulated as a carcinogen by OSHA.

Reproductive Toxicity..... Not available

Teratogenicity..... Not available

Mutagenicity..... Not available

Section 12 - Ecological Information

Fish Toxicity..... No evidence to suggest that crystalline silica is toxic to fish, invertebrates or microorganisms.

Biodegradability..... Not available

Environmental Effects..... Crystalline silica (quartz) is not known to be ecotoxic, no evidence to suggest that crystalline silica is toxic to plant life.

Section 13 - Disposal Consideration

Waste Disposal..... Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 14 - Transport Information

TDG Classification

Class..... Not regulated

Group..... Not regulated

PIN Number..... Not regulated

Other..... Secure containers (full and/or empty) with suitable hold down devises during shipment and ensure all caps, valves, or closures are secured in the closed position.

Section 15 - Regulatory Information

WHMIS Classification.....……..D2

NOTE: THE PRODUCT LISTED ON THIS MSDS HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN CONTROLLED PRODUCTS REGULATIONS. THIS MSDS CONTAINS ALL INFORMATION REQUIRED BY THOSE REGULATIONS.

Section 16 - Other Information

Note: The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations.

Attention: Receiver of the chemical goods / MSDS coordinator

As part of our commitment to the Canadian Association of Chemical Distributors (CACD) Responsible Distribution® initiative, ClearTech Industries Inc. and its associated companies require, as a condition of sale, that you forward the attached Material Safety Data Sheet(s) to all affected employees, customers, and end-users. ClearTech will send any available supplementary handling, health, and safety information to you at your request.

If you have any questions or concerns please call our customer service or technical service department.

ClearTech Industries Inc. - Locations

Corporate Head Office: 1500 Quebec Avenue, Saskatoon, SK, S7K 1V7
Phone: 306-664-2522
Fax: 306-665-6216

www.ClearTech.ca

Location	Address	Postal Code	Phone Number	Fax Number
Richmond, B.C.	12431 Horseshoe Way	V7A 4X6	604-272-4000	604-272-4596
Calgary, AB.	5516E - 40th St. S.E.	T2C 2A1	403-279-1096	403-236-0989
Edmonton, AB.	11750 - 180th Street	T5S 1N7	780-452-6000	780-452-4600
Saskatoon, SK.	19 Peters Ave, North Corman Park	S7K 1V7	306-933-0177	306-933-3282
Regina, SK.	555 Henderson Drive	S42 5X2	306-721-7737	306-721-8611
Winnipeg, MB.	340 Saulteaux Crescent	R3J 3T2	204-987-9777	204-987-9770
Mississauga, ON.	7480 Bath Road	L4T 1L2	905-612-0566	905-612-0575

24 Hour Emergency Number - All Locations - 306-664-2522

Safety Data Sheet

Issuing Date 31-Dec-2009 **Revision Date** *06-May-2011* **Revision Number** *2*

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

Product Name Fluorescein Disodium Salt

Product Code(s) 0577

Recommended Use For Further Manufacturing Use Only
Not for Human or Animal Drug Use

Recommended Use Industrial tracking dye used in fluorescence microscopy

Synonyms AIZEN URANINE * CALCOCID URANINE B4315 * 9-O-CARBOXYPHENYL-6-HYDROXY-3-ISOXANTHONE, DISODIUM SALT * CERTIQUAL FLUORESCEINE * C.I. 766 * C. I. ACID YELLOW 73 * C.I. 45350 DISODIUM SALT * C.I. 45350 SODIUM SALT * D&C YELLOW NO. 8 * DISODIUM 6-HYDROXY-3-OXO-9-XANTHENE-O-BENZOATE * FLUORESCEIN SODIUM * FLUORESCEIN SODIUM B.P * FLUORESCEIN, SOLUBLE * FLUOR-I-STRIP A.T. * FUL-GLO * FUNDUSCEIN * FURANIUM * HIDACID URANINE * NCI-C54706 * RESORCINOL PHTHALEIN SODIUM * SODIUMFLUORESCEIN * SODIUM FLUORESCEINATE * SODIUM SALT OF HYDROXY-O- CARBOXY-PHENYL-FLUORONE * SOLUBLE FLUORESCEIN * SOLUBLE FLUORESCEINE * SPIRO(ISOBENZOFURAN-1(3H),9'-(9H)XANTHEN)-3-ONE, 3',6'-DIHYDROXY-, DISODIUM SALT * URANIN * URANINE * URANINE A EXTRA * URANINE O * URANINE SS * URANINE USP XII * URANINE WSS * URANINE YELLOW * 11824 YELLOW * 12417 YELLOW *

Company
AMRESCO, LLC
6681 Cochran Road
Solon, Ohio 44139

Emergency Telephone Number Chemtrec 1-800-424-9300

Company Phone Number 1-800-448-4442
E-mail Address info@amresco-inc.com

2. HAZARDS IDENTIFICATION

GHS - Classification

Classification Not classified as a hazard

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	EC No.	REACH Reg. No.	CAS-No	Weight %	Classification
Sodium fluorescein	EEC No. 208-253-0	Not available	518-47-8	95-100	-

4. FIRST AID MEASURES

Eye Contact Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician

Skin Contact Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes

Inhalation Move to fresh air. If breathing becomes difficult, give oxygen

Ingestion Clean mouth with water and afterwards drink plenty of water

Notes to Physician Treat symptomatically

5. FIRE-FIGHTING MEASURES

Flammable Properties Not flammable

Flash Point Not determined

Suitable Extinguishing Media Dry chemical, CO2, water spray or regular foam

Hazardous Combustion Products Carbon oxides

Explosion Data

Sensitivity to Mechanical Impact Not sensitive
Sensitivity to Static Discharge Not sensitive

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

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions Avoid contact with skin, eyes and clothing. Use personal protective equipment. Ensure adequate ventilation

Methods for Containment Prevent further leakage or spillage if safe to do so

Methods for Cleaning Up Avoid dust formation. Pick up and transfer to properly labeled containers. Ventilate area and wash spill site after material pickup is complete.

7. HANDLING AND STORAGE

Handling Handle in accordance with good industrial hygiene and safety practice

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

Incompatible Products Strong oxidizing agents.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sodium fluorescein 518-47-8			

Engineering Measures Showers
Eyewash stations
Ventilation systems

Personal Protective Equipment

Eye/Face Protection Tightly fitting safety goggles

Skin and Body Protection Wear protective gloves/clothing

Respiratory Protection If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Red-Orange	
Odor	No information available	
Odor Threshold	No information available	
Decomposition Temperature °C	No information available	
Freezing Point	No information available	
Initial Boiling Point	No information available	
Physical State	Granular Powder	
pH	No data available	
Flash Point	Not determined	
Autoignition Temperature	No data available	
Boiling Point/Range	No data available	
Melting Point/Range	No data available	
Flammability Limits in Air	**Upper** No data available	**Lower** No data available
Explosive Properties	No information available	
Oxidizing Properties	No information available	
Evaporation Rate	No data available	
MMHG @ 37.8 C	No data available	
Vapor Density	No data available	
Specific Gravity	No data available	
Solubility	No information available	
Partition Coefficient (n-octanol/water)	No data available	
Viscosity	No information available	

10. STABILITY AND REACTIVITY

Stability Stable under recommended storage conditions

Incompatible Products Strong oxidizing agents.

Conditions to Avoid None known based on information supplied

Hazardous Decomposition Products Carbon oxides

Hazardous Polymerization Hazardous polymerization does not occur

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Product Information Product does not present an acute toxicity hazard based on known or supplied information

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sodium fluorescein	6721 mg/kg (Rat)		

Chronic Toxicity

Chronic Toxicity No known effect based on information supplied

Target Organ Effects Kidneys

12. ECOLOGICAL INFORMATION

Ecotoxicity
The environmental impact of this product has not been fully investigated

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method Dispose of material in accordance with all federal, state, and local regulations

Contaminated Packaging Dispose of in accordance with all federal, state and local regulations

14. TRANSPORT INFORMATION

IATA Not regulated

DOT Not regulated

15. REGULATORY INFORMATION

REACH Title VII Restrictions No information available.

Chemical Name	Dangerous Substances	Organic Solvents	Harmful Substances Whose Names Are to be Indicated on the Label	Pollution Release and Transfer Registry (Class II):	Pollution Release and Transfer Registry (Class I):	Poison and Deleterious Substances Control Law:
Sodium fluorescein	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

Component	ISHA - Harmful Substances Prohibited for Manufacturing, Importing, Transferring, or Supplying	ISHA - Harmful Substances Requiring Permission	Toxic Chemical Classification Listing (TCCL) - Toxic Chemicals	Toxic Release Inventory (TRI) - Group I	Toxic Release Inventory (TRI) - Group II
Sodium fluorescein 518-47-8 (95-100)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

International Inventories

TSCA	Complies
EINECS/ELINCS	Complies
ENCS	Complies
IECSC	Complies
KECL	Complies
PICCS	Complies
AICS	Complies

U.S. Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product does not contain any substances regulated as hazardous air pollutants (HAPS) under Section 112 of the Clean Air Act Amendments of 1990

CERCLA

U.S. State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

International Regulations

Mexico - Grade No information available.

Canada

WHMIS Hazard Class
Not determined

16. OTHER INFORMATION

Issuing Date 31-Dec-2009

Revision Date 06-May-2011

Revision Note
No information available.

Recommended Restrictions No information available

Disclaimer
The information provided on this MSDS 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 MSDS

Fisher Scientific

Material Safety Data Sheet
Rhodamine B

MSDS# 20113

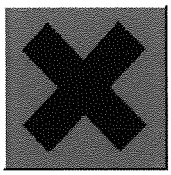
Section 1 - Chemical Product and Company Identification

MSDS Name:	Rhodamine B
Catalog Numbers:	AC132310000, AC132310250, AC132311000, AC132315000, AC296570000, AC296570100 AC296570100, AC419000000, AC419000010, 29657-0250, R21-100
Synonyms:	9-(2-Carboxyphenyl)-3,6-bis(diethylamino)xanthylium chloride; (9-Carboxyphenyl)-6-(diethylamino)-3H-xanthen-3-y lidene)diethylammonium chloride; C.I. Basic Violet 10; C.I. 45170; Tetraethylrhodamine; Basic Violet 10.
Company Identification:	Fisher Scientific One Reagent Lane Fair Lawn, NJ 07410
For information in the US, call:	201-796-7100
Emergency Number US:	201-796-7100
CHEMTREC Phone Number, US:	800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#:	81-88-9
Chemical Name:	Rhodamine B
%:	>97
EINECS#:	201-383-9

Hazard Symbols: XN



Risk Phrases: 22 41 68

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Warning! Possible risks of irreversible effects. Harmful if swallowed. Eye contact may result in permanent eye damage.
Target Organs: Kidneys, liver, respiratory system, eyes.

Potential Health Effects

Eye:	Risk of serious damage to eyes.
Skin:	May cause skin irritation. May be harmful if absorbed through the skin.
Ingestion:	Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea.
Inhalation:	May cause respiratory tract irritation. May be harmful if inhaled.
Chronic:	May cause cancer according to animal studies. Possible risk of irreversible effects.

Section 4 - First Aid Measures

Eyes:	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.
Skin:	Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Autoignition Temperature: Not available.

Flash Point: Not available

Explosion Limits: Lower: Not available

Explosion Limits: Upper: Not available

NFPA Rating: health: 3; flammability: 1; instability: 0;

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Rhodamine B	none listed	none listed	none listed

OSHA Vacated PELs: Rhodamine B: None listed

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Personal Protective Equipment

Eyes: 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: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Color: dark green

Odor: strong odor

Vapor Density: Not available
Evaporation Rate: Negligible.
Viscosity: Not available
Boiling Point: Not available
Freezing/Melting Point: 210 - 211 deg C(decom)
Decomposition Temperature:
Solubility in water: Soluble
Specific Gravity/Density: >1.0
Molecular Formula: C28H31ClN2O3
Molecular Weight: 479.01

Section 10 - Stability and Reactivity

Chemical Stability:	Stable under normal temperatures and pressures.
Conditions to Avoid:	Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials	Strong oxidizing agents, strong reducing agents.
Hazardous Decomposition Products	Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide.
Hazardous Polymerization	Will not occur.

Section 11 - Toxicological Information

RTECS#: CAS# 81-88-9: BP3675000

RTECS:

CAS# 81-88-9: Oral, mouse: LD50 = 887 mg/kg;

LD50/LC50: .

Other: Oral LD50 rat: 400-800 mg/kg. Dermal LD50 gpg: > 1.0 g/kg. Skin irritation study in gpg: Slight irritant. Chronic feeding studies in lab animals have indicated overexposure to Rhodamine B may cause liver and thryroid cancer. (Eastman Kodak)

Carcinogenicity: Rhodamine B - California: carcinogen, initial date 7/1/90 IARC: Group 3 (not classifiable)

Other: See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

US DOT
Shipping Name: Not Regulated
Hazard Class:
UN Number:
Packing Group:
Canada TDG
Shipping Name: Not regulated as a hazardous material
Hazard Class:
UN Number:
Packing Group:

Section 15 - Regulatory Information

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XN

Risk Phrases:

R 22 Harmful if swallowed

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 81-88-9: 2

Canada

CAS# 81-88-9 is listed on Canada's DSL List

Canadian WHMIS Classifications: D1B, D2A, D2B

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 those regulations.

CAS# 81-88-9 is listed on Canada's Ingredient Disclosure List

US Federal

TSCA

CAS# 81-88-9 is listed on the TSCA Inventory.

Reviewed
2012.08.16
15:44:51 -04'00'

Section 16 - Other Information

MSDS Creation Date: 12/12/1997

Revision #10 Date 7/20/2009

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantibility or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.

Material Safety Data Sheet

Section 1: PRODUCT AND COMPANY INFORMATION

Product Name(s): Lafarge Portland Cement (cement)

Product Identifiers: Cement, Portland Cement, Hydraulic Cement, Oil Well Cement, Trinity® White Cement, Antique White Cement, Portland Limestone Cement, Portland Cement Type I, IA, IE, II, I/II, IIA, II L.A., III, IIIA, IV, IVA, V, VA, 10, 20, 30, 40, 50, GU, GUL, MS, MH, HE, LH, HS, OWH, OWG Cement, OW Class G HSR

Manufacturer:
Lafarge North America Inc.
12018 Sunrise Valley Dr, Suite 500
Reston, VA 20191

Information Telephone Number:
703-480-3600 (9am to 5pm EST)

Emergency Telephone Number:
1-800-451-8346 (3E Hotline)

Product Use: Cement is used as a binder in concrete and mortars that are widely used in construction. Cement is distributed in bags, totes and bulk shipment.

Note: This MSDS covers many types of Portland cement. Individual composition of hazardous constituents will vary between types of Portland cement.

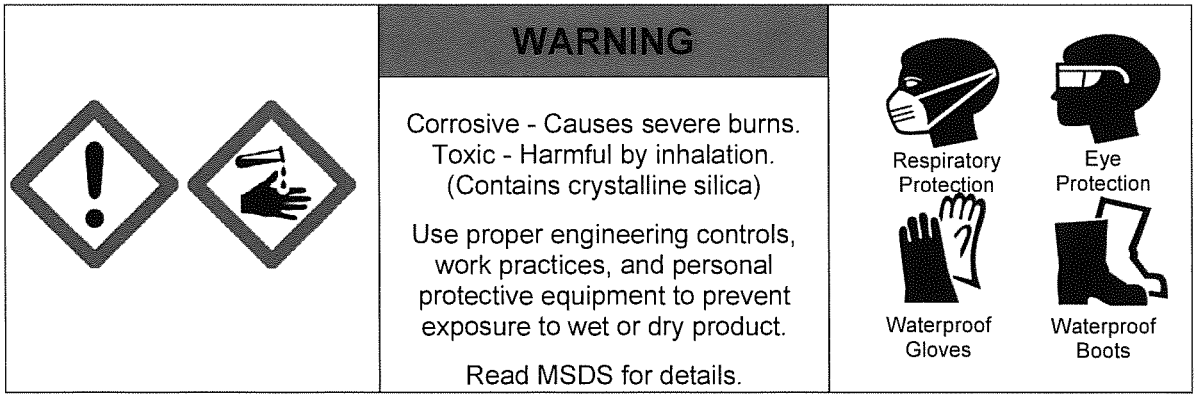
Section 2: COMPOSITION/INFORMATION ON INGREDIENTS

Component	Percent (By Weight)	CAS Number	OSHA PEL -TWA (mg/m^3)	ACGIH TLV-TWA (mg/m^3)	LD_{50} (mouse, intraperitoneal)	LC_{50}
Portland Cement*	100	65997-15-1	15 (T); 5 (R)	1 (R)	NA	NA
Calcium Sulfate*	2-10	13397-24-5	15 (T); 5 (R)	10 (T)	NA	NA
Calcium Carbonate*	0-15	1317-65-3	15 (T); 5 (R)	3 (R), 10 (T)	NA	NA
Calcium Oxide	0-5	1305-78-8	5 (T)	2 (T)	3059 mg/kg	NA
Magnesium Oxide	0-4	1309-48-4	15 (T)	10 (T)	NA	NA
Crystalline Silica	0-0.2	14808-60-7	[(10) / (%SiO_2+2)] (R); [(30) / (%SiO_2+2)] (T)	0.025 (R)	NA	NA

Note: Exposure limits for components noted with an * contain no asbestos and <1% crystalline silica

Cement is made from materials mined from the earth and is processed using energy provided by fuels. Trace amounts of chemicals may be detected during chemical analysis. For example, cement may contain trace amounts of calcium oxide (also known as free lime or quick lime), free magnesium oxide, potassium and sodium sulfate compounds, chromium compounds, nickel compounds, and other trace compounds.

Section 3: HAZARD IDENTIFICATION



Section 3: HAZARD IDENTIFICATION (continued)

Emergency Overview: Cement is a solid, grey, off white, or white odorless powder. It is not combustible or explosive. A single, short-term exposure to the dry powder presents little or no hazard. Exposure of sufficient duration to wet cement, or to dry cement on moist areas of the body, can cause serious, potentially irreversible tissue (skin, eye, respiratory tract) damage due to chemical (caustic) burns, including third degree burns.

Potential Health Effects:

Eye Contact: Airborne dust may cause immediate or delayed irritation or inflammation. Eye contact with large amounts of dry powder or with wet cement can cause moderate eye irritation, chemical burns and blindness. Eye exposures require immediate first aid and medical attention to prevent significant damage to the eye.

Skin Contact: Cement may cause dry skin, discomfort, irritation, severe burns, and dermatitis.

Burns: Exposure of sufficient duration to wet cement, or to dry cement on moist areas of the body, can cause serious, potentially irreversible damage to skin, eye, respiratory and digestive tracts due to chemical (caustic) burns, including third degree burns. A skin exposure may be hazardous even if there is no pain or discomfort.

Dermatitis: Cement is capable of causing dermatitis by irritation and allergy. Skin affected by dermatitis may include symptoms such as, redness, itching, rash, scaling, and cracking.

Irritant dermatitis is caused by the physical properties of cement including alkalinity and abrasion.

Allergic contact dermatitis is caused by sensitization to hexavalent chromium (chromate) present in cement. The reaction can range from a mild rash to severe skin ulcers. Persons already sensitized may react to the first contact with cement. Others may develop allergic dermatitis after years of repeated contact with cement.

Inhalation (acute): Breathing dust may cause nose, throat or lung irritation, including choking, depending on the degree of exposure. Inhalation of high levels of dust can cause chemical burns to the nose, throat and lungs.

Inhalation (chronic): Risk of injury depends on duration and level of exposure.

Silicosis: This product contains crystalline silica. Prolonged or repeated inhalation of respirable crystalline silica from this product can cause silicosis, a seriously disabling and fatal lung disease. See Note to Physicians in Section 4 for further information.

Carcinogenicity: Cement is not listed as a carcinogen by IARC or NTP; however, cement contains trace amounts of crystalline silica and hexavalent chromium which are classified by IARC and NTP as known human carcinogens.

Autoimmune Disease: Some studies show that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders such as scleroderma (thickening of the skin), systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys.

Tuberculosis: Silicosis increases the risk of tuberculosis.

Renal Disease: Some studies show an increased incidence of chronic kidney disease and end-stage renal disease in workers exposed to respirable crystalline silica.

Section 3: HAZARD IDENTIFICATION (continued)

Ingestion: Do not ingest cement. Although ingestion of small quantities of cement is not known to be harmful, large quantities can cause chemical burns in the mouth, throat, stomach, and digestive tract.

Medical Conditions Aggravated by Exposure: Individuals with lung disease (e.g. bronchitis, emphysema, COPD, pulmonary disease) or sensitivity to hexavalent chromium can be aggravated by exposure.

Section 4: FIRST AID MEASURES

Eye Contact: Rinse eyes thoroughly with water for at least 15 minutes, including under lids, to remove all particles. Seek medical attention for abrasions and burns.

Skin Contact: Wash with cool water and a pH neutral soap or a mild skin detergent. Seek medical attention for rash, burns, irritation, dermatitis, and prolonged unprotected exposures to wet cement, cement mixtures or liquids from wet cement.

Inhalation: Move person to fresh air. Seek medical attention for discomfort or if coughing or other symptoms do not subside.

Ingestion: Do not induce vomiting. If conscious, have person drink plenty of water. Seek medical attention or contact poison control center immediately.

Note to Physician: The three types of silicosis include:

- Simple chronic silicosis – which results from long-term exposure (more than 20 years) to low amounts of respirable crystalline silica. Nodules of chronic inflammation and scarring provoked by the respirable crystalline silica form in the lungs and chest lymph nodes. This disease may feature breathlessness and may resemble chronic obstructive pulmonary disease (COPD).
- Accelerated silicosis – occurs after exposure to larger amounts of respirable crystalline silica over a shorter period of time (5-15 years). Inflammation, scarring, and symptoms progress faster in accelerated silicosis than in simple silicosis.
- Acute silicosis – results from short-term exposure to very large amounts of respirable crystalline silica. The lungs become very inflamed and may fill with fluid, causing severe shortness of breath and low blood oxygen levels.

Progressive massive fibrosis may occur in simple or accelerated silicosis, but is more common in the accelerated form. Progressive massive fibrosis results from severe scarring and leads to the destruction of normal lung structures.

Section 5: FIREFIGHTING MEASURES

Flashpoint & Method: Non-combustible

General Hazard: Avoid breathing dust. Wet cement is caustic.

Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Firefighting Equipment: Cement poses no fire-related hazard. A SCBA is recommended to limit exposures to combustion products when fighting any fire.

Combustion Products: None.

Section 6: ACCIDENTAL RELEASE MEASURES

General: Place spilled material into a container. Avoid actions that cause the cement to become airborne. Avoid inhalation of cement and contact with skin. Wear appropriate protective equipment as described in Section 8. Scrape wet cement and place in container. Allow material to dry or solidify before disposal. Do not wash cement down sewage and drainage systems or into bodies of water (e.g. streams).

Waste Disposal Method: Dispose of cement according to Federal, State, Provincial and Local regulations.

Section 7: HANDLING AND STORAGE

General: Keep bulk and bagged cement dry until used. Stack bagged material in a secure manner to prevent falling. Bagged cement is heavy and poses risks such as sprains and strains to the back, arms, shoulders and legs during lifting and mixing. Handle with care and use appropriate control measures.

Engulfment hazard. To prevent burial or suffocation, do not enter a confined space, such as a silo, bin, bulk truck, or other storage container or vessel that stores or contains cement. Cement can buildup or adhere to the walls of a confined space. The cement can release, collapse or fall unexpectedly.

Properly ground all pneumatic conveyance systems. The potential exists for static build-up and static discharge when moving cement powders through a plastic, non-conductive, or non-grounded pneumatic conveyance system. The static discharge may result in damage to equipment and injury to workers.

Usage: Cutting, crushing or grinding hardened cement, concrete or other crystalline silica-bearing materials will release respirable crystalline silica. Use all appropriate measures of dust control or suppression, and Personal Protective Equipment (PPE) described in Section 8 below.

Housekeeping: Avoid actions that cause the cement to become airborne during clean-up such as dry sweeping or using compressed air. Use HEPA vacuum or thoroughly wet with water to clean-up dust. Use PPE described in Section 8 below.

Storage Temperature: Unlimited. **Storage Pressure:** Unlimited.

Clothing: Promptly remove and launder clothing that is dusty or wet with cement. Thoroughly wash skin after exposure to dust or wet cement.

Section 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls: Use local exhaust or general dilution ventilation or other suppression methods to maintain dust levels below exposure limits.

Personal Protective Equipment (PPE):

Respiratory Protection: Under ordinary conditions no respiratory protection is required. Wear a NIOSH approved respirator that is properly fitted and is in good condition when exposed to dust above exposure limits.

Eye Protection: Wear ANSI approved glasses or safety goggles when handling dust or wet cement to prevent contact with eyes. Wearing contact lenses when using cement, under dusty conditions, is not recommended.

Section 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION (continued)

Skin Protection: Wear gloves, boot covers and protective clothing impervious to water to prevent skin contact. Do not rely on barrier creams, in place of impervious gloves. Remove clothing and protective equipment that becomes saturated with wet cement and immediately wash exposed areas.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid (powder).	**Evaporation Rate:**	NA.
Appearance:	Gray, off white or white powder.	**pH (in water):**	12 – 13
Odor:	None.	**Boiling Point:**	>1000° C
Vapor Pressure:	NA.	**Freezing Point:**	None, solid.
Vapor Density:	NA.	**Viscosity:**	None, solid.
Specific Gravity:	3.15	**Solubility in Water:**	Slightly (0.1 - 1.0%)

Section 10: STABILITY AND REACTIVITY

Stability: Stable. Keep dry until use. Avoid contact with incompatible materials.

Incompatibility: Wet cement is alkaline and is incompatible with acids, ammonium salts and aluminum metal. Cement dissolves in hydrofluoric acid, producing corrosive silicon tetrafluoride gas. Cement reacts with water to form silicates and calcium hydroxide. Silicates react with powerful oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride.

Hazardous Polymerization: None. **Hazardous Decomposition:** None.

Section 11 and 12: TOXICOLOGICAL AND ECOLOGICAL INFORMATION

For questions regarding toxicological and ecological information refer to contact information in Section 1.

Section 13: DISPOSAL CONSIDERATIONS

Dispose of waste and containers in compliance with applicable Federal, State, Provincial and Local regulations.

Section 14: TRANSPORT INFORMATION

This product is not classified as a Hazardous Material under U.S. DOT or Canadian TDG regulations.

Section 15: REGULATORY INFORMATION

OSHA/MSHA Hazard Communication: This product is considered by OSHA/MSHA to be a hazardous chemical and should be included in the employer's hazard communication program.

CERCLA/SUPERFUND: This product is not listed as a CERCLA hazardous substance.

EPCRA SARA Title III: This product has been reviewed according to the EPA Hazard Categories promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 and is considered a hazardous chemical and a delayed health hazard.

EPRCA SARA Section 313: This product contains none of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

DICORP
DOWN TO EARTH BUSINESS

MATERIAL SAFETY DATA SHEET

EXTRA HIGH YIELD BENTONITE

SECTION I: IDENTIFICATION OF PRODUCT

COMPANY:	**Diversity Technologies Corp.** **8750 – 53rd Ave.** **Edmonton, AB T6E 5G2**	DATE: PHONE: FAX:	**June 11, 2013** **780-440-4923** **780-469-1899**

PRODUCT NAME: **Extra High Yield Bentonite**

PRODUCT USE:	Drilling fluid & cement additive		
CHEMICAL FAMILY:	Bentonite clay	CAS #:	1302-78-9

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

WHMIS CLASSIFICATION:	D2A
WORKPLACE HAZARD:	Potential carcinogen; contains crystalline silica

TRANSPORTATION OF DANGEROUS GOODS (TDG)

PROPER SHIPPING NAME:	Not regulated under TDG
TDG CLASSIFICATION:	Not applicable
UN NUMBER (PIN):	Not applicable
PACKING GROUP:	Not applicable

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT	% (w/w)	CAS NUMBER	LD_{50}Oral-Rat	LC_{50}Inhal-Rat	ACGIH-TLV
Crystalline silica; quartz	2 – 6	14808-60-7	Not available	Not available	0.025 mg/m^3

SECTION III: HEALTH HAZARDS

ROUTE OF ENTRY: ☐ EYE CONTACT ☐ SKIN CONTACT ☑ INHALATION ☐ INGESTION

EYE CONTACT:	May cause mechanical irritation.
SKIN CONTACT:	Possible drying resulting in dermatitis.
INGESTION:	No adverse effects expected.
INHALATION:	Inhalation may cause irritation of the nose, throat and respiratory passages. Long-term inhalation may cause silicosis, a progressive, disabling and, sometimes, fatal lung disease. Chronic inhalation exposure to crystalline silica quartz has been observed to cause lymph node effects, kidney effects and auto-immune disease.

CARCINOGENICITY:	Bentonite is not listed as a carcinogen. Crystalline silica when inhaled in the form of quartz or crystobalite from occupational sources is carcinogenic to humans: The IARC has concluded that this chemical is carcinogenic to humans (Group 1). The ACGIH has designated this chemical as a suspected human carcinogen (A2). The US NTP has listed this chemical as a known human carcinogen.
TERATOGENICITY:	No information available.
REPRODUCTIVE TOXICITY:	No information available.
MUTAGENICITY:	Crystalline silica has been shown to cause mutagenic effects in human cells in-vitro.
SYNERGISTIC PRODUCTS:	No information available.

SECTION IV: FIRST AID MEASURES

SKIN CONTACT:	If irritation occurs or when shift ends, wash with soap and water until clean.
EYE CONTACT:	Flush with water until irritation ceases. If irritation persists, contact a physician.
INGESTION:	No first aid required; material is non-toxic.
INHALATION:	Move to area free from dust. Apply oxygen or artificial respiration if required. If breathing difficulties, or distress, continue obtain medical attention.

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOUR:	Pale grey to buff powder, granule or tablet; no odour
SPECIFIC GRAVITY:	2.45 – 2.55
BOILING POINT (°C):	Not applicable
MELTING POINT (°C):	1450°C (approx)
SOLUBILITY IN WATER:	Insoluble pH: 8-10 (5% aq. suspension)
PERCENT VOLATILE BY VOLUME:	Not available
EVAPORATION RATE:	Not applicable
VAPOUR PRESSURE (mmHg):	Not applicable
VAPOUR DENSITY (air = 1):	Not applicable
BULK DENSITY:	55 lb/ft^3

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	Not applicable
FLAMMABLE LIMITS:	Not applicable
EXTINGUISHING MEDIA:	Use media suitable for and packaging and surrounding fire. Product becomes very slippery when wet, avoid using water as fire-fighting agent.
SPECIAL FIRE FIGHTING PROCEDURES:	Self-contained breathing apparatus required for fire-fighting personnel.

UNUSUAL FIRE AND EXPLOSION HAZARDS:	None known.
HAZARDOUS COMBUSTION PRODUCTS:	No information available.

SECTION VII: REACTIVITY DATA

STABILITY:	☑ STABLE	☐ UNSTABLE
INCOMPATIBILITY (CONDITIONS TO AVOID):	None known.	
CONDITIONS OF REACTIVITY:	Not available	
HAZARDOUS DECOMPOSITION PRODUCTS:	None known	
HAZARDOUS POLYMERIZATION:	☑ WILL NOT OCCUR	☐ MAY OCCUR

SECTION VIII: PREVENTIVE MEASURES

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:	NIOSH/MESA approved respirators for silica bearing dust.
VENTILATION:	Use local ventilation, process enclosure or other engineering controls to maintain airborne concentration of dust below TLV.
PROTECTIVE GLOVES:	Generally not necessary; personal preference.
EYE PROTECTION:	Suggest goggles.
OTHER PROTECTIVE EQUIPMENT (SPECIFY):	Ensure emergency eye wash station and safety shower are available.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid breathing dust; wear approved respiratory protection. Practice reasonable caution and personal cleanliness. Avoid eye contact. Store in cool, dry area. Empty packages contain residual hazardous material and should be handled as if full.

STEPS TO BE TAKEN IN CASE THE MATERIAL IS SPILLED OR RELEASED

Avoid breathing dust; wear an approved respirator. Vacuum to avoid generating airborne dust. Avoid using water. Product slippery when wet. Collect uncontaminated material for repackaging. Collect contaminated material in an approved container for disposal.

WASTE DISPOSAL METHOD

Dispose in accordance with federal, provincial and local regulations. It is the responsibility of the end-user to determine if material meets the criteria of hazardous waste at the time of disposal. Empty packaging must be disposed of in accordance with local regulations.

SECTION IX: PREPARATION

The information contains herein is given in good faith, but no warranty, expressed or implied, is made.

DATE ISSUED:	**June 11, 2013**
SUPERSEDES:	June 27, 2010
BY:	Regulatory Affairs
PHONE:	780-440-4923

Material Safety Data Sheet
(R.D.O. 302 ES (Nonsoluble & Soluble)

Material Identification and Use

MANUFACTURER'S NAME.....Control Chemical (1989) Corp.
MANUFACTURER'S ADDRESS .....7016 30 Street SE Calgary, AB T2C 1N9
EMERGENCY PHONE NUMBER..... (403) 720-7044
SUPPLIER IDENTIFIER.....
SUPPLIER'S ADDRESS.....
SUPPLIER EMERGENCY PHONE NUMBER.....
PRODUCT IDENTIFIER .....RDO 302 ES (Nonsoluble & Soluble)
PRODUCT USE.....Rock Drill Oil (vegetable oil based)

Hazardous Ingredients of Materials

Chemical Identity	Concentration	CAS#/NA#/UN#	LD(50)	LC(50)
This is not a hazardous or controlled product.				

Physical Data For Product

PHYSICAL STATE.....Liquid
ODOUR AND APPEARANCE .....Dark Brown, Distinctive
ODOUR THRESHOLD .....Not Available
SPECIFIC GRAVITY.....907
VAPOUR PRESSURE.....Not Available
VAPOUR DENSITY (air=1) .....Not Available
EVAPORATION RATE .....Not Available
BOILING POINT.....>300 degrees C
FREEZING POINT.....-30 degrees C
pH.....7.0 - 7.3
DENSITY (g/ml).....Not Available
COEFFICIENT OF WATER/OIL DISTRIBUTION.....Not Available

Fire and Explosion Hazard of Product

CONDITIONS OF FLAMMABILITY .....Open Flame, Above Flash Point
MEANS OF EXTINCTION.....Foam, C02, Dry Chemical, Water Spray
FLASHPOINT AND METHOD OF DETERMINATION ..>279 degrees C C.O.C.
UPPER EXPLOSION LIMIT(% BY VOL).....Not Available
LOWER EXPLOSION LIMIT(% BY VOL).....Not Available
AUTO-IGNITION TEMPERATURE.....Not Available
FLAMMABILITY CLASSIFICATION .....Not Available
HAZARDOUS COMBUSTION PRODUCTS.....Toxic fumes may evolve on burning.
EXPLOSION DATA.....Not sensitive to mechanical impact.
SENSITIVITY TO STATIC DISCHARGE.....Not sensitive to static discharge.

Reactivity Data

CHEMICAL STABILITY	Stable
INCOMPATIBLE MATERIALS	Oxidizing agents.
CONDITIONS OF REACTIVITY	None
HAZARDOUS DECOMPOSITION PRODUCTS	Oxides of Sulphur, Carbon upon burning.

Toxicological Properties of Product

ROUTES OF ENTRY	
SKIN CONTACT	Prolonged exposure may cause irritation in some individuals.
SKIN ABSORPTION	None
EYE	Not Expected
INHALATION	None
INGESTION	LD50 >5000mg/kg
ACUTE OVER EXPOSURE EFFECTS	None
CHRONIC OVER EXPOSURE EFFECTS	Possible skin irritation from prolonged over exposure.
EXPOSURE LIMITS	Not Established
IRRITANCY OF PRODUCT	None
SENSITIZATION TO MATERIAL	None
CARCINOGENICITY, REPRODUCTIVE EFFECTS	None
TERATOGENICITY, MUTAGENICITY	None
TOXICOLOGICALLY SYNERGISTIC PRODUCTS	None

Preventive Measures

PERSONAL PROTECTIVE EQUIPMENT	None
SPECIFIC ENGINEERING CONTROLS	None
LEAK AND SPILL PROCEDURES	Although product is environmentally safe, spills should be contained and picked up.
WASTE DISPOSAL	Disposal shall be in compliance with Federal, Provincial, and Local laws.
HANDLING PROCEDURES AND EQUIPMENT	None
STORAGE REQUIREMENTS	None
SPECIAL SHIPPING INFORMATION	Not Regulated.

First Aid Measures

SPECIFIC FIRST AID PROCEDURES	Flush eyes with water. Wash skin with soap and water. In case ofingestion, do not induce vomiting. Call a physician immediately.

Preparation Date of Material Safety Data Sheet

PREPARED BY	Control Chemical (1989) Corp.
PHONE NUMBER OF PREPARER	(403) 720-7044
DATE PREPARED	January 01, 2011

The information contained herein is based on data believed to be reliable, but is presented without guarantee or warranty and Control Chemical (1989) Corporation disclaims any liability incurred from the use thereof.

MATERIAL SAFETY DATA SHEET

TORQUELESS

Product Identification

MANUFACTURER'S NAME:	Control Chemical (1989) Corporation
MANUFACTURER'S ADDRESS:	7016, 30th Street S.E. Calgary, Alberta, Canada T2C 1N9
EMERGENCY PHONE NUMBER:	(403) 720-7044
SUPPLIER IDENTIFIER:	
SUPPLIER'S ADDRESS:	
SUPPLIER'S EMERGENCY PHONE NUMBER:	
PRODUCT IDENTIFIER:	TORQUELESS
PRODUCT USE:	Drilling Lubricant (Vegetable oil base)

Hazardous Ingredients of Materials

Chemical Identity	Concentration	CAS#/NA#/UN# LD (50) LC (50)

This is not a hazardous or controlled product.

Physical Data for Product

PHYSICAL STATE:	Liquid
ODOUR AND APPEARANCE:	Dark brown, distinctive
ODOUR THRESHOLD:	
SPECIFIC GRAVITY:	0.887
VAPOR PRESSURE:	Not established
VAPOR DENSITY (Air = 1):	Not established
EVAPORATION RATE:	Not established
BOILING POINT:	>300 degrees C
FREEZING POINT:	-18 degrees C
pH:	7.0 – 7.2
DENSITY (g/ml):	
COEFFICIENT OF WATER / OIL DISTRIBUTION:	Not available

Fire and Explosion Hazard of Product

CONDITIONS OF FLAMMABILITY:	Open Flame, Above Flash Point
MEANS OF EXTINCTION:	Foam, $C0_2$, Dry Chemical, water spray
FLASHPOINT AND METHOD OF DETERMINATION:	290 degrees C C.C.
UPPER EXPLOSION LIMIT (% by Vol):	Not available
LOWER EXPLOSION LIMIT (% by Vol):	Not available
AUTO-IGNITION TEMPERATURE:	Not available
FLAMMABILITY CLASSIFICATION:	
HAZARDOUS COMBUSTION PRODUCTS:	Not available
EXPLOSION DATA:	Not available
SENSITIVITY TO STATIC DISCHARGE:	None

Reactivity Data

CHEMICAL STABILITY:	Stable
INCOMPATIBLE MATERIALS:	None
CONDITIONS OF REACTIVITY:	None
HAZARDOUS DECOMPOSITION PRODUCTS:	If burnt, oxides of sulphur

MATERIAL SAFETY DATA SHEET

TORQUELESS

Toxicological Properties of Product

ROUTES OF ENTRY:	
SKIN CONTACT:	Wash with soap and water
SKIN ABSORBTION:	None
EYE:	Flush with water for 15 minutes
INHALATION:	No hazard during normal use
INDIGESTION:	Do not induce vomiting, contact physician. Not toxic
ACUTE OVER EXPOSURE EFFECTS:	Inhalation: Not hazardous unless burning toxic fumes possible. Ingestion: Greater than 5000 mg/kg in rats. Eyes: Eye irritation not expected. Skin: No skin irritation or allergic reaction expected
CHRONIC OVER EXPOSURE EFFECTS:	Inhalation: Not hazardous unless burning toxic fumes possible. Ingestion: Greater than 5000 mg/kg in rats. Eyes: Eye irritation not expected. Skin: No skin irritation or allergic reaction expected
EXPOSURE LIMITS:	Not available
IRRITANCY OF PRODUCT:	Not an irritant
SENSITIZATION TO MATERIAL:	None
CARCINOGENICITY, REPRODUCTIVE EFFECTS:	Not available
TERATOGENICITY, MUTAGENICITY:	Not available
TOXICOLOGICALLY SYNERGISTIC PRODUCTS:	Not available

Preventive Measures

PERSONAL PROTECTIVE EQUIPMENT:	Not necessary
SPECIFIC ENGINEERING CONTROLS:	
LEAK AND SPILL PROCEDURES:	Although product is environmentally safe, spills should be contained and wiped up
WASTE DISPOSAL:	Although product is environmentally safe, spills should be contained and wiped up. Dispose according to Federal, Provincial or Municipal Laws
HANDLING PROCEDURES AND EQUIPMENT:	None
STORAGE REQUIREMENTS:	None
SPECIAL SHIPPING INFORMATION:	Not Regulated.

First Aid Measures

SPECIFIC FIRST AID PROCEDURES:	Eyes: Flush with water for 15 minutes Ingestion: Do not induce vomiting, contact physician. Not toxic. Skin: Wash with soap and water.

Preparation Date of Material Safety Data Sheet

PREPARED BY:	Safety Committee
PHONE NUMBER OF PREPARER:	(403) 720-7044
DATE PREPARED:	January 02, 2011

Material Safety Data Sheet

HOLE CONTROL

Material Identification and Use

MANUFACTURER'S NAME ..... CONTROL CHEMICAL (1989) CORPORATION
MANUFACTURER'S ADDRESS ..... 7016 30 Street SE Calgary, AB Canada T2C 1N9
EMERGENCY PHONE NUMBER ..... (403) 720-7044
SUPPLIER IDENTIFIER .....
SUPPLIER'S ADDRESS .....
SUPPLIER EMERGENCY PHONE NUMBER .....
PRODUCT IDENTIFIER ..... HOLE CONTROL
PRODUCT USE ..... Drilling Mud

Hazardous Ingredients of Materials

Chemical Identity	Concentration	CAS#/NA#/UN#	LD(50)	LC(50)
Mineral Spirits	7-14%	CAS 64742-47-8	(Oral, Rat) Over 8 ml/kg or >6,400 mg/kg	N/E

Physical Data For Product

PHYSICAL STATE ..... Liquid
ODOUR AND APPEARANCE ..... Slight oil smell, brown appearance.
ODOUR THRESHOLD ..... N/E
SPECIFIC GRAVITY 0.98
VAPOUR PRESSURE ..... N/E
VAPOUR DENSITY (air=1) ..... N/E
EVAPORATION RATE ..... N/E
BOILING POINT ..... N/E
FREEZING POINT ..... -30 Degrees C
pH 8-9
DENSITY (g/ml) ..... N/E
COEFFICIENT OF WATER/OIL DISTRIBUTION ..... N/E

Fire and Explosion Hazard of Product

CONDITIONS OF FLAMMABILITY ..... Requires a source of ignition, the presence of air, and a temperature greater than the flashpoint.
MEANS OF EXTINCTION ..... In case of fire, foam, dry chemical, or CO2. AVOID USE OF WATER-SLIPPERY CONDITIONS WILL OCCUR.
FLASHPOINT AND METHOD OF DETERMINATION .. >200 degrees F
UPPER EXPLOSION LIMIT(% BY VOL) ..... N/E
LOWER EXPLOSION LIMIT(% BY VOL) ..... N/E
AUTO-IGNITION TEMPERATURE ..... N/E
FLAMMABILITY CLASSIFICATION ..... N/A
HAZARDOUS COMBUSTION PRODUCTS ..... CO, CO2, Oxides of sulphur produced on combustion.
EXPLOSION DATA ..... N/E
SENSITIVITY TO STATIC DISCHARGE ..... N/A

HOLE CONTROL

Reactivity Data

CHEMICAL STABILITY	Stable
INCOMPATIBLE MATERIALS	Oxidizing materials.
CONDITIONS OF REACTIVITY	N/A
HAZARDOUS DECOMPOSITION PRODUCTS	N/A

Toxicological Properties of Product

ROUTES OF ENTRY	
SKIN CONTACT	Contact may cause irritation, redness, swelling or dermatitis.
SKIN ABSORPTION	N/A
EYE	Will cause painful burning or stinging of eyes and lids, watering of eyes, and inflammation of conjunctiva.
INHALATION	N/A
INGESTION	May cause gastrointestinal irritation, cramps, diarrhoea.
ACUTE OVER EXPOSURE EFFECTS	N/E
CHRONIC OVER EXPOSURE EFFECTS	Skin irritation or dermatitis may occur upon frequent or prolonged contact.
EXPOSURE LIMITS	N/E
IRRITANCY OF PRODUCT	Moderate skin and eye irritant.
SENSITIZATION TO MATERIAL	N/E
CARCINOGENICITY, REPRODUCTIVE EFFECTS	N/E
TERATOGENICITY, MUTAGENICITY	N/E
TOXICOLOGICALLY SYNERGISTIC PRODUCTS	N/E

Preventive Measures

PERSONAL PROTECTIVE EQUIPMENT	Wear eye/face protection. Wear suitable gloves.
SPECIFIC ENGINEERING CONTROLS	N/A
LEAK AND SPILL PROCEDURES	CONTAIN THE SPILL. SOAK UP WITH AN ABSORBENT MATERIAL. CLEAN WITH AN ADEQUATE SOLVENT.
WASTE DISPOSAL	In accordance with Municipal, Provincial and Federal regulations.
HANDLING PROCEDURES AND EQUIPMENT	N/A
STORAGE REQUIREMENTS	STORE IN A TIGHTLY SEALED CONTAINER.
SPECIAL SHIPPING INFORMATION	Not Regulated TDG and I.A.T.A.

First Aid Measures

SPECIFIC FIRST AID PROCEDURES	FLUSH EYES WITH WATER. RINSE CONTAMINATED SKIN WITH SOAP AND WATER. IF INGESTED, GIVE WATER. DO NOT INDUCE VOMITING. CALL A PHYSICIAN.

Preparation Date of Material Safety Data Sheet

PREPARED BY	The Safety Committee
PHONE NUMBER OF PREPARER	(403) 720-7044
DATE PREPARED	January 2, 2011

The information contained herein is based on data believed to be reliable, but is presented without guarantee or warranty & Control Chemical (1989) Corporation, disclaims any liability incurred from the use thereof.

MATERIAL SAFETY DATA SHEET

MAPAC

Product Identification

MANUFACTURER'S NAME:	Control Chemical (1989) Corporation
MANUFACTURER'S ADDRESS:	7016, 30th Street S.E. Calgary, Alberta, Canada T2C 1N9
EMERGENCY PHONE NUMBER:	(403) 720-7044
SUPPLIER IDENTIFIER:	
SUPPLIER'S ADDRESS:	
SUPPLIER'S EMERGENCY PHONE NUMBER:	
PRODUCT IDENTIFIER:	MAPAC
PRODUCT USE:	

Hazardous Ingredients of Materials

Chemical Identity	Concentration	CAS#/NA#/UN# LD (50) LC (50)

This is not a WHMIS controlled product.

Physical Data for Product

PHYSICAL STATE:	Dry granular, light coloured powder
ODOUR AND APPEARANCE:	Dry granular, light coloured powder. No odour.
ODOUR THRESHOLD:	
SPECIFIC GRAVITY:	1.6 g/ml (H_2O=1)
VAPOR PRESSURE:	Not applicable
VAPOR DENSITY (Air = 1):	Not applicable
EVAPORATION RATE:	
POILING POINT:	Not applicable
FREEZING POINT:	
pH:	
DENSITY (g/ml):	Not established
COEFFICIENT OF WATER / OIL DISTRIBUTION:	

Fire and Explosion Hazard of Product

CONDITIONS OF FLAMMABILITY:	If in a finely divided and suspended state, treat as a flammable dust
MEANS OF EXTINCTION:	Dry Chemical, Foam or carbon dioxide (CO_2), water spray or fog.
FLASHPOINT AND METHOD OF DETERMINATION:	Not applicable
UPPER EXPLOSION LIMIT (% by Vol):	Not established
LOWER EXPLOSION LIMIT (% by Vol):	Not established
AUTO-IGNITION TEMPERATURE:	
FLAMMABILITY CLASSIFICATION:	
HAZARDOUS COMBUSTION PRODUCTS:	
EXPLOSION DATA:	
SENSITIVITY TO STATIC DISCHARGE:	

Reactivity Data

CHEMICAL STABILITY:	Stable
INCOMPATIBLE MATERIALS:	Not established
CONDITIONS OF REACTIVITY:	Not established
HAZARDOUS DECOMPOSITION PRODUCTS:	Not established

MATERIAL SAFETY DATA SHEET

MAPAC

Toxicological Properties of Product

ROUTES OF ENTRY:	
SKIN CONTACT:	No special garments required. Avoid unnecessary skin contact. May produce slight irritation with prolonged contact with moistened product
SKIN ABSORBTION:	
EYE:	Use safety glasses with side shields. Dust may produce mechanical irritation
INHALATION:	Non-irritating to mucous membranes, however, breathing high concentrations of the dust may cause mechanical irritation of the nose, throat, and upper respiratory tract.
INGESTION:	Passes through relatively inert. May cause some gastrointestinal upset. Oral LD50 > 25g/kg (rats).
ACUTE OVER EXPOSURE EFFECTS:	
CHRONIC OVER EXPOSURE EFFECTS:	No adverse effects have been noticed in chronic feeding studies using laboratory animals and humans. Sarcomas were exhibited at injection sites of animals receiving repeated massice subcutaneous injections of aqueous solutions of the material.
EXPOSURE LIMITS:	
IRRITANCY OF PRODUCT:	
SENSITIZATION TO MATERIAL:	
CARCINOGENICITY, REPRODUCTIVE EFFECTS:	
TERATOGENICITY, MUTAGENICITY:	
TOXICOLOGICALLY SYNERGISTIC PRODUCTS:	

Preventive Measures

PERSONAL PROTECTIVE EQUIPMENT:	Use approved dust respirator. Chemical goggles recommended
SPECIFIC ENGINEERING CONTROLS:	
LEAK AND SPILL PROCEDURES:	Sweep up spill and place in disposal container. If wet, material becomes very slippery
WASTE DISPOSAL:	Sanitary landfill or incineration. Diluted aqueous solutions may be flushed to sewer
HANDLING PROCEDURES AND EQUIPMENT:	Avoid inhalation of dust. Avoid eye contact
STORAGE REQUIREMENTS:	Store in a cool, dry area in sealed containers or bags
SPECIAL SHIPPING INFORMATION:	Not Regulated.

First Aid Measures

SPECIFIC FIRST AID PROCEDURES:	Flush eyes with water. Rinse contaminated skin with soap and water. In case of discomfort by vapors or dusts, move to a ventilated area. If ingested, give plenty of water, induce vomiting. If adverse symptoms develop, call a physician

Preparation Date of Material Safety Data Sheet

PREPARED BY:	Safety Committee
PHONE NUMBER OF PREPARER:	(403) 720-7044
DATE PREPARED:	January 02, 2013

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