POLARIS MINE

POST-RECLAMATION MONITORING REPORT

2008 4th QUARTER and 2008 ANNUAL REPORT

FOR THE NUNAVUT WATER BOARD

&

INDIAN AND NORTHERN AFFAIRS CANADA

February 12, 2009

Teck

DISTRIBUTION LIST

1. Nunavut Water Board - 2 copies
   Manager of Licensing
   Nunavut Water Board
   P.O. Box 119
   Gjoa Haven, NU X0B 1J0

2. Indian and Northern Affairs Canada – 1 copy
   Manager, Land Administration
   Department of Indian Affairs and Northern Development
   Box 100
   Iqaluit, NU X0A 0H0

3. Teck Cominco Metals Ltd. – 2 copies
   Teck, Kimberley Office
   601 Knighton Road
   Kimberley, B.C. V1A 3E1

Teck Cominco Metals Ltd.
Bag 2000
Kimberley, BC Canada V1A 3E1
www.teck.com

Teck

February 12, 2009

Nunavut Water Board
Box 119
Gjoa Haven, NU
X0B 0J0
Attention: Phyllis Beaulieu, Manager of Licensing

Indian and Northern Affairs Canada
969 Qimugjuk Building, 2nd Floor
Iqaluit, Nunavut
X0A 0H0
Attention: Spencer Dewar, Manager, Lands Administration

Dear Ms. Beaulieu and Mr. Dewar;

Re: Polaris Mine Water Licence NWB1POL0311 – 2008 4th Quarter and Annual Water Licence and Decommissioning and Reclamation Plan Reports

Please find attached the Polaris Mine 2008 4th Quarter and 2008 Annual Reports required under Polaris's Water Licence and Decommissioning and Reclamation Plan (DRP). I have attached paper copies of this report to this letter in addition to an electronic copy (pdf format on CD). I have not included a translation into Inuktitut as the translator is currently travelling. I will forward the translation electronically as soon as we receive it.

There were no activities or sampling done at the Polaris Mine site during the 4th Quarter of 2008 as the site was snow covered and there were no effluent discharges due to the freezing temperatures. Apart from the sampling of Garrow Lake in the 2nd Quarter of 2008, all monitoring was conducted during the 3rd Quarter of 2008 which was previously reported. It has now been six years since the mine ceased production and closed and four years since reclamation was completed (with the exception of a few minor items). The Polaris Mine is a Recognized Closed Mine under the Metal Mining Effluent Regulations (MMER) and has no further obligations under MMER.

If you have any questions regarding this report, please do not hesitate to contact me.

Yours truly,

Bruce J. Donald
Reclamation Manager
Environment and Corporate Affairs
Teck Cominco Limited

Teck

TABLE OF CONTENTS

PAGE

1. INTRODUCTION 1
2. 2008 4th QUARTER REPORT 1
   - 2.1. Reclamation Activities 1
   - 2.2. Site Monitoring 2
   - 2.3. Financial Reporting 4
     - 2.3.1. Updated Financial Report 4
     - 2.3.2. Request for Adjustment 5
3. 2008 ANNUAL REPORT 5
   - 3.1. Unauthorized Discharges 5
   - 3.2. Progress Report of Studies and Plans 6
   - 3.3. Executive Summary of Report Translated into Inuktitut 6
   - 3.4. Summary of Closure and/or Reclamation Work Undertaken 7
   - 3.5. Estimate of the Total Mine Closure Cost 7
   - 3.6. Public Consultation / Participation 7
   - 3.7. Work Conducted in Response to Inspection or Compliance Reports 7
   - 3.8. Effluent and Water Quality Studies Conducted 7
     - 3.8.1. Quantities of Fresh Water Pumped From Frustration Lake ... 7
     - 3.8.2. Garrow Lake Water Column Monitoring 7
     - 3.8.3. Garrow Lake Effluent Monitoring 7
   - 3.9. Details of Water Use or Waste Disposal Requested By the Board 7

LIST OF APPENDICES

APPENDIX 1 **Executive Summary Translated into Inuktitut**

APPENDIX 2 **December 2008 Update to the Polaris Mine Spill Contingency Plan**

APPENDIX 3 **2008 Update of Reclamation and Monitoring Costs**

APPENDIX 4 **Garrow Lake Water Column Monitoring Data**

APPENDIX 5 **Electronic Copy of Files on CD**

1. INTRODUCTION

The Polaris Mine ceased operation in September of 2002. Immediately upon mine closure, reclamation activities commenced in accordance with the Decommissioning and Reclamation Plan (DRP) approved by the Nunavut Water Board and Indian and Northern Affairs Canada. The DRP as well as the Water Licence requires reporting of work and monitoring activities on both a quarterly and an annual basis. This document includes both the 2008 4th Quarter and the 2008 Annual Report for the Polaris Mine site.

An executive summary of this report translated into Inuktitut is included as Appendix 1.

2. 2008 4th QUARTER REPORT

2.1. Reclamation Activities

During the entire 4th Quarter of 2008, the Polaris Mine remained unoccupied by personnel. No reclamation activities were undertaken.

2.2. Site Monitoring

During the entire 4th Quarter of 2008, the Polaris Mine remained unoccupied by personnel and no monitoring events occurred as all surface waters were frozen. As a result there is no effluent water quality data to report.

2.3. Financial Reporting

2.3.1. Updated Financial Report

An update of reclamation and monitoring costs is presented in Appendix 3. Costs for 2008 were $261,000. While the MMER requirements were no longer required at the site, the Water Licence and DRP still include the same intense water quality monitoring program. Until rationalization of water quality monitoring program is achieved, the monitoring costs will continue at a higher than forecast level. Forecast costs include the final demobilization costs from the site prior to the Water Licence and Land Leases expiring.

2.3.2. Request for Adjustment`

Part B Section 3 of the Water Licence requires that the Licensee shall provide the updated financial report (Section 2.3.1 of this report) along "with the amount of credit adjustment requested, documented and related to the original remediation cost estimate". Based on the enclosed cost report and estimated costs to complete the obligations under the Water Licence and Land Leases, it is forecast that there is $815,500 remaining to be expended. Assuming even a 100% contingency for unforeseen costs, expenditures remaining would be in the order of $1,600,000.

It is requested that the requirement for reclamation security be reduced to $1,600,000.

3. 2008 ANNUAL REPORT

Part B, Section 6 of the Water Licence requires that an Annual Report be filed that includes the following topics.

3.1. Unauthorized Discharges

The Polaris Mine had no unauthorized discharges to report.

3.2. Progress Report of Studies and Plans

Progress on reports and/or revision of any studies or plans requested by the Board is listed below:

- Submission in electronic format of the very comprehensive 2004 Annual Report was made in September 2005 which included the final reporting of the reclamation activities and of the water quality monitoring program results that occurred during 2004. A number of requested studies and as-built drawings remained outstanding when the report was submitted. These deficiencies have been corrected. This report is being resubmitted in paper and electronic format concurrent with this report and includes all the previously missing information.
- The site's Emergency Response plan has been updated to reflect the site being dormant for the majority of the year and the current facilities and equipment remaining on site (enclosed with this report in Appendix 2).

3.3. Executive Summary of Report Translated into Inuktitut

Included in Appendix 1 is an executive summary of both the 2008 4th Quarter Report and the 2008 Annual Report translated into Inuktitut.

3.4. Summary of Closure and/or Reclamation Work Undertaken

A summary of any closure and reclamation work undertaken during the year and an outline of work anticipated for the next year is outlined below:

- On July 13 a small crew of 5-6 people re-opened the camp and a minimum of 5 people remained on site until July 19 to complete the annual site inspection.
- Clean up of site litter continued while crews were on site.
- The subsidence survey was completed and the results showed no identifiable movement from previous years.
- During the open water period on Garrow Lake, when no personnel were on site, the wind speeds were monitored at Resolute Bay. Two high wind events were noted in Resolute on Aug. 5-6 and Aug. 28-29. Detailed sampling was routinely performed on Garrow Lake Aug. 29th and no impact from the high winds was detected.
- The waters discharging from Garrow Lake into Garrow Creek were fully compliant with the Water Licence during the year.
- Garrow Lake stratigraphy continues to be both physically and chemically stable based on both the May and August sampling events.
- The annual geotechnical inspection was completed by an independent professional geotechnical engineer. In the 2007 inspection, it was noted that there was a section of exposed geotextile in the channel down stream of the toe of the decommissioned dam. I was decided that the best course of action was to remove the exposed geotextile. The removal of the geotextile was completed in the 3rd Quarter. There were no active areas of erosion identified however, a minor slope failure (due to saturated soils) was identified in the 3rd Quarter at the Main Portal area. This will be repaired in 2010.
- In the summer of 2009 it is anticipated that contractors will be invited to come to site to review what equipment and materials remain on site to enable them to prepare proposals for

the final removal of these from the site prior to expiry of the Water Licence and Land Leases in 2011.

3.5. Estimate of the Total Mine Closure Cost

An update of reclamation and monitoring costs is presented in Appendix 3. Costs for 2008 were $261,000. While the MMER requirements were no longer required at the site, the Water Licence and DRP still include the same intense water quality monitoring program. Until rationalization of water quality monitoring program is achieved, the monitoring costs will continue at a higher than budgeted level. Forecast costs include the final demobilization costs from the site prior to the Water Licence and Land Leases expiring.

3.6. Public consultation / Participation

- No public consultations were conducted as the site is basically dormant other than for monitoring.
- At least one Inuit resident from Resolute assists with the annual inspection and maintenance program at the site. In addition to providing local employment, the local knowledge for the safety of workers on site is important. Having a local resident involved with monitoring of the site has the benefit of ensuring that the nearest community is aware of site activity and site conditions.

3.7. Work Conducted in Response to Inspection or Compliance Reports

A brief summary of work done to address concerns or deficiencies listed in inspection/or compliance reports were as follows:

- 2008 site activities included clean up of debris that is part of an ongoing effort during summer monitoring events.
- The small section of exposed geotextile was removed for aesthetic reasons.

3.8. Effluent and Water Quality Studies Conducted

3.8.1. Quantities of Fresh Water Pumped From Frustration Lake

The water licence requires the monthly and annual quantities (in cubic metres) of water pumped from Frustration Lake to be reported.

- No water was pumped as the site's freshwater system was demolished and reclaimed in 2004.

3.8.2. Garrow Lake Water Column Monitoring

During 2008, the Water Licence required three monitoring events (at mid-winter, at maximum ice thickness, and at maximum ice melt) in two separate locations of the Garrow Lake water column stratigraphy. The mid-winter monitoring event was not conducted as charter aircraft will not fly to this isolated, abandoned site in the dark. The maximum ice thickness and maximum melt monitoring events took place as required and were reported in the 2nd and 3rd Quarter monitoring reports.

To review the trend of water quality, graphs have been prepared of the zinc concentration by depth in Garrow Lake for each sampling event starting in 2002 (the last year the mine was discharging tailings into the lake), through until August of 2008. The monitoring results from each year are included in Appendix 4 in Table 1 and Table 2 with the data plotted in Figures 1 through 3.

Figure 1 – Station 262-3 Zinc Trends

Figure 1 displays the zinc concentrations by depth below surface of Garrow Lake at monitoring station 262-3 for each monitoring event from 2002 to 2008. There is a clear and consistent trend of reducing zinc concentrations especially below the 10 metre depth in the water column. Between the bottom of the Mixolimnium layer and the top of the Pycnocline layer there is a sharp transition in density. At the top of the Pycnocline it is postulated that due to a thin accumulated layer of bacterial tissue that zinc concentrations are sharply higher. As the layer is very thin, if water samples are collected from even slightly different depths, the resulting measured zinc concentrations change significantly. This would explain the more scattered nature of the zinc data around the 10 m depth.

Figure 2 – Station 262-3A Zinc Trends

Figure 2 at monitoring station 262-3A is a graph of the zinc concentrations from 2004 to 2008 (this is a newer station added into the water licence). This graph displays essentially the identical results as Station 262-3 for the time period that this station has been sampled. There is a clear and consistent trend of reducing zinc concentrations especially below the 10 metre depth of the water column. Similar scattering of results around the 10m depth occurs at this station as seen in Figure 1.

Figure 3 – Comparison between Stations 262-3 and 262-3A

Figure 3 compares the August 2003 zinc concentrations at Station 262-3 and 262-3A. The graph clearly shows there is no difference in the water quality between the two stations. There is some scatter of data around the 10 – 11 metre depth due to the spike in concentrations at that depth. Inadvertently sampling a little higher or lower in the water column significantly influences the data results. As the samples are taken from a boat in August, and typically there are waves on the lake, it is hard to be precise with sampling depths under those conditions. Teck continues to maintain that neither new nor additional information is gained by having two stations sampling the same water sources in Garrow Lake.

3.8.3. Garrow Lake Effluent Monitoring

The Water Licence and the DRP requires sampling of the Final Discharge Point from Garrow Lake during periods of effluent discharge. All water quality results were compliant with the parameters specified in the Water Licence. In addition there was no acute toxicity in either the Rainbow Trout or the Daphnia magna. The details of the monitoring results can be found in the previously submitted 3rd Quarter Report.

3.9. Details of Water Use or Waste Disposal Requested By the Board

- There is no fresh water use at the site. No details of water use have been requested by the board.
- Waste disposal was restricted to collection of site litter that has been stockpiled for future disposal in LRD Quarry Landfill

APPENDIX 1

Executive Summary

Translated into Inuktitut

APPENDIX 2

December 2008 Update

To

Polaris Mine Spill Contingency Plan

Polaris Mine
Post - Demolition and Site Reclamation
Spill Contingency Plan

December 2008

TABLE OF CONTENTS

1.0 Introduction 1
1.1 Purpose 1
2.0 Hazardous Substances - Storage Facilities 2
2.1 Chemicals 2
2.2 Petroleum Products 2
3.0 Response Organization Structure and Reporting Sequence 3
4.0 Organization Roles and Responsibilities 4
5.0 Activation of Spill Contingency Plan 4
6.0 Spill Reporting 5
6.1 External 5
7.0 Material Safety Data Sheets (MSDS) 7
7.1 Diesel, Hydraulic/Transmission Fluids and Waste Oil 7
8.0 Resource Inventory and Logistics 8

LIST OF TABLES

Table 1 Senior Management Telephone Listing 6
Table 2 Responsibilities of Key Project Personnel for Spill Incident 8

LIST OF APPENDICES

Appendix 1 Location and Site Maps
Appendix 2 MSDS Sheets
Appendix 3 Spill Report Form

1.0 INTRODUCTION

The Polaris Mine is located on Little Cornwallis Island within the Territory of Nunavut (Figure 1, Appendix 1) and is an underground lead and zinc mine owned and operated by Cominco since 1981 (now Teck Cominco Metals Ltd.). Mining of the ore body reserve was completed in September 2002 and decommissioning and site remediation was completed by September 2004. Since September 2004 the site is vacant apart from a short period of time each July when a crew of 3 to 6 people stay on site for monitoring, inspection and additional reclamation activities. Additionally, there are two people that attend the site for 2 to 4 hours per trip for environmental monitoring purposes on a weekly basis when there is flow in Garrow Creek (July to mid September).

The SCP is an update to the previous Spill Contingency Plan prepared by SNC Lavalin in 2003 for decommissioning. As such, the contents of the SCP also conform to the general requirements for spill response plans, as detailed in the Nunavut *Spill Contingency Planning and Reporting Regulations.*

1.1 Purpose

The purpose of the Spill Contingency Plan is to provide a course of action to be implemented in the event of an incidental release of hazardous/toxic substances in order to prevent and/or minimize any possible harmful effects to the environment.

The plan describes detail actions for monitoring, prevention and containment of spills, spill response reporting to regulatory agencies, as well as provisions for clean-up and disposal of spilled hazardous materials.

The SCP is designed for staff and contractors, when on site, and defines responsibilities of key personnel and procedures/protocols to be followed when responding to a spill.

The SCP for the Polaris Mine is intended to allow for the most effective deployment of resources to achieve the following primary objectives:

- immediate notification within the company to assure that an appropriate and timely response is initiated;
- ensure compliance with regulations for notification and reporting of spills to all parties involved;
- provide the earliest possible response to a spill scenario with available on-site and off-site resources;
- a response consistent with remedial action requirements, which include the need for containment, clean-up and disposal phases; and
- to assign roles and responsibilities in the event of a spill.

2.0 HAZARDOUS SUBSTANCES - STORAGE FACILITIES

2.1 Chemicals

All chemicals have been removed and any residuals have been cleaned up and removed during decommissioning.

2.2 Petroleum Products

The following fuel storage tanks are located at the Polaris Mine site.

Tanks (diesel)	Location
5,700 L	In bermed area south of camp
5,700 L	In bermed area south of camp
5,000 L (double walled tank)	Adjacent to bermed area, south of camp

Diesel will be the main fuel used during the site reclamation works (P50). It is used for power generation and mobile equipment. Currently there is approximately 10,000 litres of fuel on site and this will reduce with time.

Gasoline usage is expected to be minimal, and will be restricted to that used for skidoos, all-terrain vehicles (ATV's). Gasoline will be stored in 205-L gallon drums in a sea container located near the camp.

Lubricating hydraulic/transmission oil, grease and engine oil for equipment and generators will be stored in 205-L drums on pallets in well a marked location beside the fuel tank farm in sea containers. Up to approximately 10 drums (total of 2,050 L) are kept on site. This supply is replenished from Resolute Bay as required.

Jet B fuel will be stored in drums on pallets at the airstrip to refuel the Medivac in case of emergency. Approximately 5 drums or 1,000 L will be stored on-site.

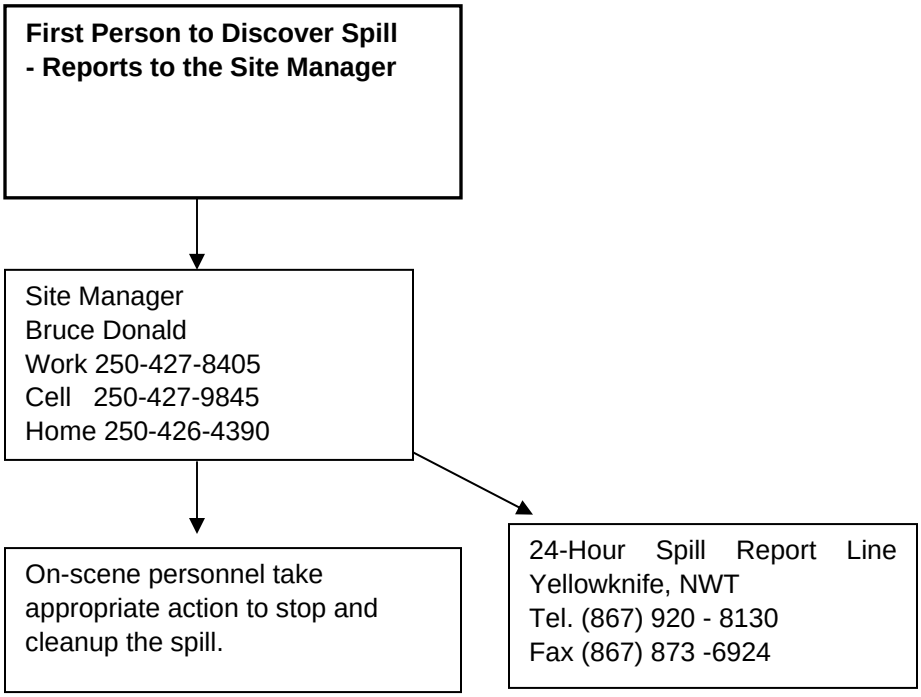
3.0 RESPONSE ORGANIZATION STRUCTURE AND REPORTING SEQUENCE

Figure 3 indicates the response organization structure and their reporting protocol for a spill situation.

TABLE 1
Spill Contingency
Senior Management Telephone Listing

Name	Company	Title	Telephone
Bruce Donald	**Teck Cominco Ltd**	**Site Manager**	**250-427-8405 Cell 250-426-9845 Home 250-426-4390**
David Ryder	**Teck Cominco Ltd**	**Alternate Site Manager**	**250-427-8416 Cell 250-520-0050 Home 250-429-6802**

Figure 3 - **Response Organization Structure and Reporting Sequence**



4.0 ORGANIZATION ROLES AND RESPONSIBILITIES

The major responsibilities and roles of key employees who will be participating in a spill response situation are presented in Table 2.

Table 2 – Responsibilities of Key Project Personnel for Spill Incident

Title	Responsibility
Teck Site Manager or on-site representative	• Have spill situation evaluated to assess magnitude and type of spill. • Report spill incident to 24-hour Spill Report Line and Teck Environment Group. • Coordinate and oversee personnel and equipment resources to conduct spill containment, recovery, clean-up and disposal. • Document chronology of spill event and clean-up efforts.

5.0 ACTIVATION OF SPILL CONTINGENCY PLAN

FIRST PERSON TO OBSERVE THE SPILL:

Ensure personal and worker safety, if you cannot identify the spilled substance consider it dangerous.

If personnel are injured

- Call for medical help, attend to injured person, and administer first aid if safe to do so.

If Safe

- Stop all sources of ignition and stop or reduce the source flow of the spill
- Shut off all valves
- Shut off all electrical power
- Initiate containment
- Put down adsorbent pads and berm spill area, if possible
- Do not enter confined spaces
- Do not expose self to fire hazard
- Complete the spill report form and report the spill

If Unsafe

- Initiate evacuation (uphill or upwind, whichever is appropriate) – move to safe area
- Notify Site Manager
- Isolate area and deny entry until qualified response personnel arrive
- Deny access to all unauthorized personnel
- Complete the spill report form and report the spill
- Update Site Manager on spill status

6.0 Spill Reporting

Notification of any spill will be made immediately to the Site Manager or alternate.

6.1 External

Spills of petroleum products or other hazardous substances will be reported to the Nunavut/Northwest Territories 24 hour Spill Report Line, in accordance the regulations. Upon notification of a spill, the Teck Site Manager will determine whether the spill requires reporting to other regulatory agencies, such as the DIAND and Federal Department of Fisheries and Oceans. All spills must be reported to the regulatory agencies as soon as possible within 24 hours of their occurrence. Telephone number is 867-920-8130. A written report is also required and is to be faxed to 867-873-6924.

In accordance with the regulations, a Spill Report will be prepared and transmitted to the Nunavut/N.W.T. spill centre. If the Site Manager or alternate is not available, then the responsible person on site will report the spill.

The reporting person must give as much of the following information as possible:

a) date and time of spill

b) location of Spill:
Polaris Mine site, Little Cornwallis Island

c) direction spill is moving

d) name and phone number of a contact person close to the spill location

e) type of contaminant spilled and quantity spilled

f) cause of spill

g) whether spill is continuing or has stopped

h) description of existing containment

i) action taken to contain, recover, clean up and dispose of spilled contaminant

j) name, address and phone number of person reporting spill

k) name of owner or person in charge, management or control of contaminants at time of spill

Reporting Instructions:

1. Report to the 24-hour Spill Report Line. All spills will be reported by telephone. The Fax number is only to be used to transmit more detailed information and the written Spill Report.

2. Fill out "Spill Report" (Appendix 3) form as completely as possible. This report must be filled out and submitted within 24 hours of the occurrence. Due to the remote location (no fax or email), the information would normally be transmitted by phone to a person assigned to complete the Spill Report and fax it as required.

24 Hour Spill Report Line
Telephone Number: (867) 920-8130
Fax Number: (867) 873-6924

Other contacts in Nunavut and N.W.T. are:

Environmental Protection Service Phone: (867) 975-5900
Dept. of Sustainable Development Fax: (867) 975- 5981
Government of Nunavut

Government of the N.W.T. Phone: (867) 873-7654
Pollution Control Division Fax : (867) 873-0221
Yellowknife, N.W.T

Indian and Northern Affairs Canada Phone:(867)975-4549
Environment and Contaminants

Environment Canada Phone (867)920-8130
Environmental Protection

7.0 MATERIAL SAFETY DATA SHEETS (MSDS)

Information with respect to potential contact with hazardous and flammable substances and information on their safe handling for all materials to be transported, stored and used on site MSDS are included. MSDS sheets are in accordance with WHMIS standards (Appendix 2).

7.1 Diesel, Hydraulic/Transmission Fluids and Waste Oil

Spill On Land

- Secure area and restrict access to unnecessary personnel.
- Provide containment by digging cut off trenches and berming.
- Stop or cover entrance of spilled material into watercourse or ditches/drains.
- Stop a tank leak/overflow by the following actions;
  - Cease filling operations
  - Turn off valve(s)
  - Contain spill
  - Close drains
- Build dikes or berms with earth, sand or other blocking media to contain spill.
- Remove/clean-up small spill by applying absorbents and place contaminated material in marked containers/drums.
- Recover large quantity spill with pump and transfer to drum(s) or storage tank for re-use or disposal.
- Remove soil material affected by spill using shovels, backhoe or other mechanical method, when safe to do so.
- Contaminated soil material is to be temporarily stockpiled with protective plastic liner placed under and over stockpile.
- Segregate and dispose of contaminated soil material and absorbents to off-site licensed disposal facility.

Spill On Snow and Ice

- Stop or cover entry of spill material into watercourse, ocean or ditches/drains.
- Build dykes with snow and water to make impermeable barrier for containment.
- Cut or excavate slots or trenches in ice/permafrost as a secondary containment measure for spill.
- Remove small spills by applying absorbent or snow.
- Remove large spills with pump and transfer to drums or storage tank.
- Burn (in-situ) spill material collected in trench, if safe to do.
- If spill is under ice, drill through ice and pump out spill to storage tank or drums for reuse or disposal.
- Dispose of contaminated absorbents to off-site licensed disposal facility.

Spill On Water

In addition to the specific procedures detailed in Section 5.3.1 for an off-shore spill, the following general procedures will be followed for spills on water.

- Deploy boom to contain the floating product.
- Use absorbent pads to recover small spills on water. For large spill seek assistance from external environmental unit.
- Pump recovered material to tank for storage and disposal.
- Recovered product is to be stored and shipped off site for recycling or disposal.

8.0 RESOURCE INVENTORY AND LOGISTICS

This section details the resources such as equipment, machinery and tools that is available on site to respond to a spill and clean-up situation, as well as general site logistics.

Land

Equipment available on the site for a land spill includes the following and this can be supplemented with contractor's equipment from Resolute Bay (depending on size and availability of airplanes). This is a generalized list of the existing equipment on site.

Equipment List Updated December 2008.

6	-	Honda Quads
1	-	Cat D6 Dozer
1	-	Skidozer All Terrain/Snow Vehicle
1	-	CAT 345BL Excavator
1	-	Ford 8 yd. Dump truck

There will not be a significant change to the equipment resource inventory during the remainder of work at site as these units are being maintained and are required for project completion.

Spill Response Kits

There is a substantial supply of spill response kits stored in a sea container adjacent to the camp near the fuel and lubricant storage areas. As a minimum requirement, each spill kit will include the following items:

- 1 - 45 gallon (205 L) gauge open top drum with cover, bolt ring and gasket

- 1 - 48” x48” x1/16’ neoprene pad (drain stop/plug)
- 2 - Splash protective goggles
- 2 - PVC oil resistant gloves
- 1 - Package polyethylene disposable bags (5 mm) 10 per pack
- 1 - Shovel (spark proof)
- 1 - Case (T-12) 3” x 12’ mini booms/case
- 15 - bags (HP – 256) 17” x19”x1/2” pads, 100 pads/bail
- 10 - bags of Sphag Sorp TM

Boats

- 1 - 16 ft. Work Boat with Outboard Motor
- 1 - 12 ft. Work Boat with Outboard Motor

Safety Equipment/Special Clothing

- 10 - Oil Proof Clothing (Tyvek Suits)
- 2 - D.O.T. Approved Flotation Suits
- 10 - Splash Protective Goggles
- 10 – PVC Oil Resistant Gloves
- These items will be located in the sea containers on the south side of camp.

Generators/Lights

- Spot Lights 9 (battery)
- Small Honda Portable Generator.

Other Oil Spill Control Equipment/Materials

- Anchors, Ropes, Absorbents, shovels, picks, boxes of oil absorbent diapers, Miscellaneous Small Items

Air Transportation

Seasonal Factors

- Personnel are only on site during seasons when there is at least partial day light. At these times there is no major deterrent to year-round air access to the mine-site from Resolute or major centres in the south. The on site airstrip is functional at any time when there is day light.

- Fog and blowing snow restrict flights on occasion.

Site Facilities

- The landing strip at Polaris is 1,225 metres long but is no longer listed with Navigation Canada. It is capable of handling DC-3, Twin Otter, Dash-7 type aircraft and Hercules aircraft (Maximum 75% loaded).
- The strip is not lighted and is not equipped with instrument guidance beacon facilities.
- Frequent air fights to and from the Polaris Mine site supply fresh food and allow for staff/consultants and contractors to come and go at the site during the period of time when the annual site inspections are underway.
- Up to weekly flights of less than four hours on site occur at other times during the summer when there are no staff staying on site.

Local Air Service

- Ken Borek Air operates Twin Otter aircraft out of Resolute year-round.

Communications

External

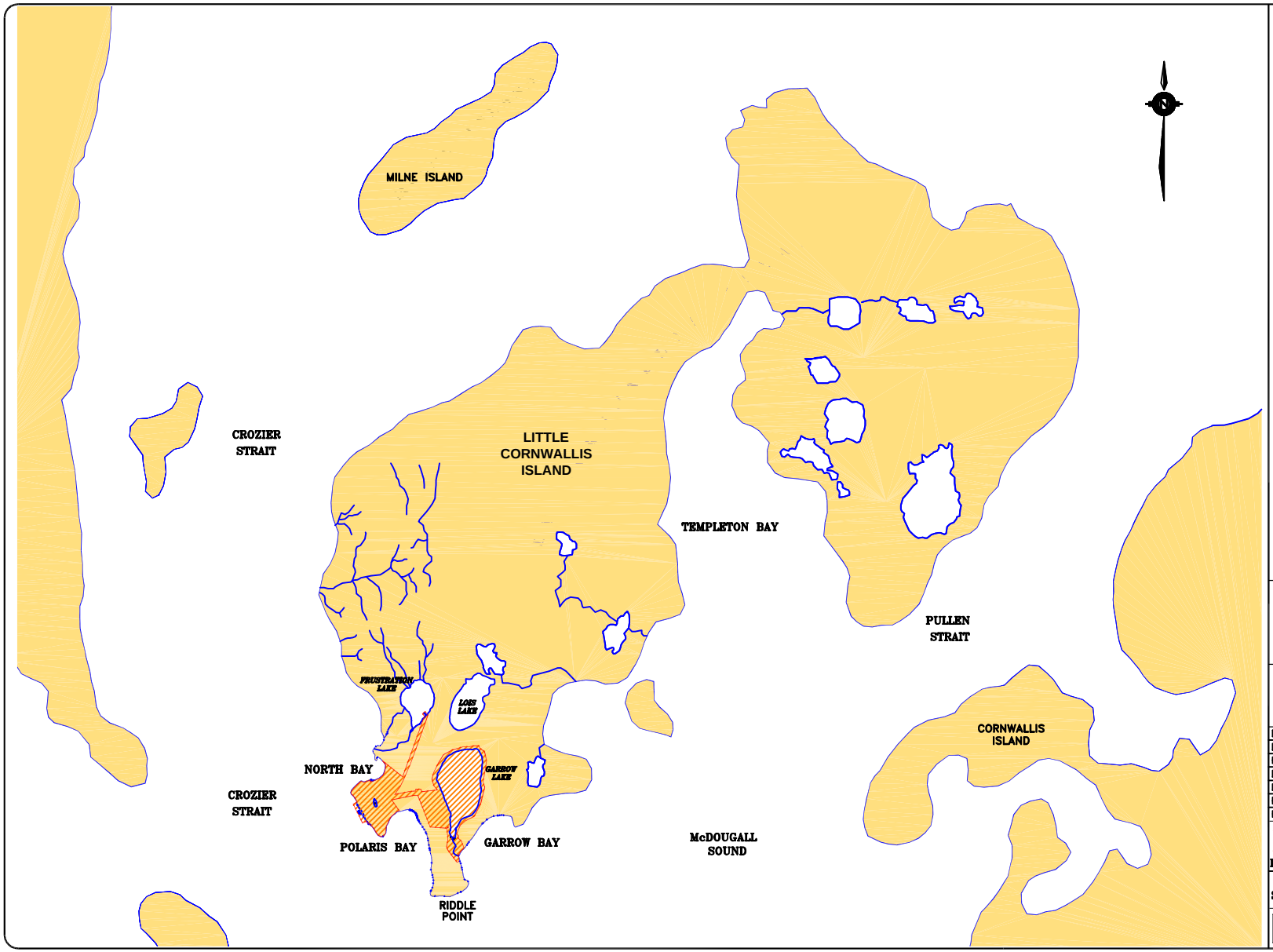
- The only communications is via Iridium satellite telephones that personnel carry to site with them.

Local

- Hand held radios with several kilometres of range (line of sight) for routine use at the site.

Appendix 1

LOCATION & SITE MAPS



LEGEND

SHORE LINE

POLARIS MINE – LAND LEASE AREAS

Notes:

0 1.5 3.0 4.5 6.0 7.5 Km

SCALE 1:150,000

DRAWING INFORMATION
DESIGNED BY: EG
REVIEWED BY: AJK
DRAWN BY: DL/CPW
DATE ISSUED: FEBRUARY 15, 2001
PROJECT NUMBER: 20-935
FILE NAME: 20935-F2-01.dwg

Cominco Ltd.
Polaris Mine
Decommissioning & Reclamation Plan

LITTLE CORNWALLIS ISLAND
SHOWING LOCATION OF POLARIS MINE

Gartner Lee Limited

Figure No. 1

NORTH BAY

AN
NORTH PORTAL
LITTLE RED DOG QUARRY
WATER TOWER
2000 N
POWER LINES
NEW QUARRY
FRESH WATERLINE
DIESEL TANK
PP
FRESH WATERLINE
MAIN PORTAL
LOADING DOCK
PP
BARGE
DIESEL TANK
PP
CG
ACCOMMODATIONS
AIRSTRIP
PP
FORMER CONCENTRATE BUILDING
LOON LAKE
CR
CG
LOON LAKE SNOW DUMP
FRESH WATERLINE
DDH CORE STORAGE
"CLAW'S" CORNER
CG
HW
FORMER CRUSHER
DETONATOR MAGAZINE
1000 N
PP
FOLDAWAY BUILDINGS
PP
DIESEL TANK FARM
CG
OPERATIONAL LANDFILL
ACCESS ROAD TO GARROW LAKE
CROZIER STRAIT
POLARIS BAY
ACCESS ROAD TO GARROW LAKE & DAM
1000 E
2000 E
3000 E

LOCAL MINE NORTH
TRUE NORTH

LEGEND
- TAILINGS LINE
- POWER LINE
- WATER LINE
- ROADS

HAZARDOUS WASTE
CG - COMPRESSED GAS
CR - CHEMICAL / REAGENT
AN - AMMONIUM NITRATE
PP - PETROLEUM PRODUCTS

0 50 100 200 300 400 500 Metres
SCALE 1:10,000

NOTES:

DRAWING INFORMATION:	
DESIGNED BY:	
REVIEWED BY:	
DRAWN BY:	
DATE ISSUED:	December 2003
PROJECT NUMBER:	
FILE NAME:	
REVISION:	

teckcominco

POLARIS MINE

HAZARDOUS WASTE LOCATIONS

Figure No. 2

Appendix 2

MSDS Sheets

TABLE OF CONTENTS

- Automatic Transmission Fluid
- Diesel - Arctic
- Ethylene Glycol
- Gasoline - Generic
- Grease
- Hydraulic Oil
- Jet B Fuel
- Lead Acid Batteries
- Lubricating Oil
- Motor Oil
- Oxygen
- Propane
- Varsol
- Windshield Washer Fluid

Automatic Transmission Fluid (ATF)

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                       M S D S                         *
*                                                       *
*  Canadian Centre for Occupational Health and Safety   *
* * * * * * * * * * * * Issue : 2001-1 (February, 2001) *
```

*** IDENTIFICATION ***

MSDS RECORD NUMBER	: 2314190
PRODUCT NAME(S)	: BP AUTRAN ATF + 3 AUTOMATIC TRANSMISSION FLUID; ATF; LUBRICATING OIL
PRODUCT IDENTIFICATION	: MSDS No. 12752 US/ENGLISH CAS NUMBER: 72623-86-0
DATE OF MSDS	: 2000-01-11
CURRENCY NOTE	: This MSDS was provided to CCOHS in electronic form on 2000-05-31

*** MANUFACTURER INFORMATION ***

MANUFACTURER	: BP Lubricants
ADDRESS	: 28100 Torch Parkway Warrenville Illinois U.S.A. 60555-4015 Telephone: 630-434-6377 (OTHER PRODUCT SAFETY INFORMATION)
EMERGENCY TELEPHONE NO.	: 312-856-2200 (HEALTH INFORMATION, USA) 703-527-3887 (SPILL INFORMATION, CHEMTREC, USA)

*** MATERIAL SAFETY DATA ***

BP AUTRAN ATF + 3

MATERIAL SAFETY DATA SHEET

BP AUTRAN ATF + 3

MSDS No. 12752 US/ENGLISH

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER/SUPPLIER:
BP Lubricants
28100 Torch Parkway
Warrenville, Illinois 60555-4015
U.S.A.

EMERGENCY HEALTH INFORMATION:
1 (800) 447-8735

EMERGENCY SPILL INFORMATION:

1 (800) 424-9300 CHEMTREC (USA)

OTHER PRODUCT SAFETY INFORMATION:
1 (630) 434-6377 (USA)

SUBSTANCE: BP AUTRAN ATF + 3

TRADE NAMES/SYNONYMS:
AUTOMATIC TRANSMISSION FLUID; ATF; LUBRICATING OIL

CREATION DATE: Jan 11 2000
REVISION DATE: Jan 21 2000

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: HYDROTREATED NEUTRAL OIL-BASED LUBRICATING OIL
CAS NUMBER: 72623-86-0
EC NUMBER (EINECS): 276-737-9
PERCENTAGE: 77.0-87.0

COMPONENT: POLYALKYL METHACRYLATE
CAS NUMBER: Not assigned.
EC NUMBER: Not assigned.
PERCENTAGE: 2.6-13.0

COMPONENT: MEDIUM ALIPHATIC SOLVENT NAPHTHA
CAS NUMBER: 64742-88-7
EC NUMBER (EINECS): 265-191-7
PERCENTAGE: 1.0-7.0

(See Section 8, "Exposure Controls, Personal Protection", for exposure guidelines)

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=1 REACTIVITY=0

EMERGENCY OVERVIEW:
COLOR: red
PHYSICAL FORM: oil
ODOR: hydrocarbon odor
MAJOR HEALTH HAZARDS: Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.

POTENTIAL HEALTH EFFECTS:
INHALATION:
High vapor concentrations can cause headaches, dizziness, drowsiness, and nausea, and may lead to unconsciousness.
SKIN CONTACT:
Causes mild skin irritation. Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.
EYE CONTACT:
Causes mild eye irritation.
INGESTION:
Ingestion causes gastrointestinal irritation and diarrhea.

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash exposed skin with soap and water. Remove contaminated clothing and thoroughly clean and dry before reuse. Get medical attention if irritation develops.

EYE CONTACT: Flush eyes with plenty of water. Get medical attention if irritation persists.

INGESTION: If swallowed, drink plenty of water. Get immediate medical attention. Induce vomiting only at the instructions of a physician. Do not give anything by mouth to unconscious or convulsive person.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Slight fire hazard.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical, regular foam, water

FIRE FIGHTING: Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Water or foam may cause frothing.

FIRE FIGHTING PROTECTIVE EQUIPMENT: Firefighters should wear full bunker gear, including a positive pressure self contained breathing apparatus.

FLASH POINT: >351 F (>177 C) (COC)

FLAMMABILITY CLASSIFICATION: Not Flammable.

HAZARDOUS COMBUSTION PRODUCTS:
Thermal decomposition products or combustion: aldehydes, hydrocarbons, oxides of carbon, oxides of calcium, oxides of sulfur, oxides of zinc

SECTION 6 ACCIDENTAL RELEASE MEASURES

Stop leak if possible without personal risk. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Keep unnecessary people away, isolate hazard area and deny entry. Large spills: Dike for later disposal. Cover with plastic sheet or tarp to minimize spreading and protect from contact with water. Prevent spreading by diking, ditching, or absorbing on inert materials.

SECTION 7 HANDLING AND STORAGE

STORAGE: Avoid extremes in storage temperatures. Store in a cool, dry, well-ventilated area. Store away from heat, ignition sources, and open flame in accordance with applicable regulations. Keep container tightly closed. Do not store in unlabeled containers.

HANDLING: Keep away from all ignition sources. Use only with adequate ventilation. Do not eat, drink or smoke in areas of use or storage. Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet facilities. Wash thoroughly after work using soap and water. Remove contaminated clothing and thoroughly clean and dry before reuse. SPECIAL PRECAUTIONS: Empty containers may contain toxic, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
HYDROTREATED NEUTRAL OIL-BASED LUBRICATING OIL:
MINERAL OIL MIST:
5 mg/m3 OSHA TWA

5 mg/m3 ACGIH TWA (Notice of Intended Changes 1993-1994)
10 mg/m3 ACGIH STEL (Notice of Intended Changes 1993-1994)
5 mg/m3 MEXICO TWA
10 mg/m3 MEXICO STEL

MEDIUM ALIPHATIC SOLVENT NAPHTHA:
MINERAL OIL MIST:
5 mg/m3 OSHA TWA
5 mg/m3 ACGIH TWA (Notice of Intended Changes 1993-1994)
10 mg/m3 ACGIH STEL (Notice of Intended Changes 1993-1994)
5 mg/m3 MEXICO TWA
10 mg/m3 MEXICO STEL

VENTILATION: Use with adequate ventilation. Control airborne concentrations below the exposure guidelines.

EYE PROTECTION: Do not get in eyes. Wear eye protection.

CLOTHING: Avoid repeated or prolonged contact. Wear protective clothing if prolonged or repeated contact is likely.

GLOVES: Wear protective gloves if prolonged or repeated contact is likely.

PROTECTIVE MATERIAL TYPES: neoprene, nitrile butadiene rubber (NBR)

RESPIRATOR: Use with adequate ventilation.
Avoid breathing vapor or mist.
If ventilation is inadequate, use a NIOSH certified respirator with an organic vapor cartridge and P95 particulate filter.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid
COLOR: red
PHYSICAL FORM: oil
ODOR: hydrocarbon odor
BOILING POINT: Not available
FREEZING POINT: Not available
VAPOR PRESSURE: Not available
VAPOR DENSITY: Not available
SPECIFIC GRAVITY (water=1): 0.910 @ 16 C
BULK DENSITY: 0.910 g/cm3
WATER SOLUBILITY: Not available
PH: Not available
VOLATILITY: Not available
ODOR THRESHOLD: Not available
EVAPORATION RATE: slower than ether
VISCOSITY: 7.4-7.7 cSt @ 100 C
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials.

INCOMPATIBILITIES: strong oxidizing materials

HAZARDOUS DECOMPOSITION:
Thermal decomposition products or combustion: aldehydes, hydrocarbons, oxides of carbon, oxides of calcium, oxides of sulfur, oxides of zinc

POLYMERIZATION: Will not polymerize.

SECTION 11 TOXICOLOGICAL INFORMATION

EYE IRRITATION: Testing not conducted. See Other Toxicity Data.

SKIN IRRITATION: Testing not conducted. See Other Toxicity Data.

DERMAL LD50: Testing not conducted. See Other Toxicity Data.

ORAL LD50: Testing not conducted. See Other Toxicity Data.

INHALATION LC50: Testing not conducted. See Other Toxicity Data.

OTHER TOXICITY DATA:
Specific toxicity tests have not been conducted on this product. Our hazard evaluation is based on information from similar products, the ingredients, technical literature, and/or professional experience.

No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program, the U.S. Occupational Safety and Health Act, or the International Agency on Research on Cancer (IARC).

SECTION 12 ECOLOGICAL INFORMATION

Ecological testing has not been conducted on this product by BP Amoco.

SECTION 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

SECTION 14 TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION: Not regulated.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: Not regulated.

LAND TRANSPORT ADR/RID: Not regulated.

AIR TRANSPORT IATA/ICAO: Not regulated.

MARITIME TRANSPORT IMDG: Not regulated.

SECTION 15 REGULATORY INFORMATION

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR Part 302.4): This product is not reportable under 40 CFR Part 302.4.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR Part 355): This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA TITLE III SECTION 311/312 HAZARDOUS CATEGORIZATION (40 CFR Part 370):
ACUTE: N
CHRONIC: N
FIRE: N
REACTIVE: N

SUDDEN RELEASE: N

SARA TITLE III SECTION 313 (40 CFR Part 372): This product is not regulated under Section 313 of SARA and 40 CFR Part 372.

STATE REGULATIONS:
California Proposition 65: N

TSCA INVENTORY STATUS: Listed on inventory.

OSHA HAZARD COMMUNICATION STANDARD: Contains a component listed by ACGIH. Contains a component listed by OSHA.

EC INVENTORY (EINECS/ELINCS): One or more components not listed on inventory.

JAPAN INVENTORY (MITI): Not determined.

AUSTRALIA INVENTORY (AICS): Not determined.

KOREA INVENTORY (ECL): Not determined.

CANADA INVENTORY (DSL): Listed on inventory.

PHILIPPINE INVENTORY (PICCS): Not determined.

CHINA INVENTORY (IECS): Not determined.

SECTION 16 OTHER INFORMATION

Prepared by: Product Stewardship and Toxicology

This Material Safety Data Sheet conforms to the requirements of ANSI Z400.1. NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

DIESEL FUEL

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                       M S D S                         *
*                                                       *
*  Canadian Centre for Occupational Health and Safety   *
* * * * * * * * * * * * Issue : 2001-1 (February, 2001) *
```

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2482868
PRODUCT NAME(S) : LIGHT DISTILLATE
ESSO STOVE OIL (DYED OR CLEAR)
DIESEL ARCTIC (DYED OR CLEAR)
ESSO DIESEL DEW (DYED OR CLEAR)
ESSO DIESEL ARCTIC (DYED OR CLEAR)
ESSO STOVE QUALITY COMMERCIAL FUEL
ESSO STOVE QUALITY FURNACE FUEL
ESSO STOVE QUALITY HEATING OIL (DYED OR CLEAR)
STOVE QUALITY FURNACE FUEL
DIESEL 60 (DYED OR CLEAR)
DIESEL DEW (DYED OR CLEAR)
ESSO DIESEL 60 (DYED OR CLEAR)
ESSO DIESEL LIGHT (DYED OR CLEAR)
STOVE OIL (DYED OR CLEAR)
STOVE QUALITY HEATING OIL (DYED OR CLEAR)
ESSO DIESEL FUEL OIL 50 (DYED OR CLEAR)
DIESEL LOW SULFUR LIGHT (DYED OR CLEAR)
LIGHT DISTILLATE (LOW SULFUR)
STOVE QUALITY COMMERCIAL FUEL
DIESEL FUEL OIL 50 (DYED OR CLEAR)
DIESEL LIGHT (DYED OR CLEAR)
DIESEL LOW SULFUR LIGHT DYED EP
FURNACE LIGHT (DYED OR CLEAR)
PRODUCT IDENTIFICATION : MSDS Number: 08529
DATE OF MSDS : 1998-05-12
CURRENCY NOTE : This MSDS was provided to CCOHS in electronic form on 2000-12-14

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Imperial Oil (Products Division)
ADDRESS : 111 St Clair Avenue West
Toronto Ontario
Canada M5W 1K3
Telephone: 416-968-4111

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : Imperial Oil (Products Division)
ADDRESS : 111 St Clair Avenue West
Toronto Ontario
Canada M5W 1K3
Telephone: 416-968-4111

*** MATERIAL SAFETY DATA ***

Date Prepared: May 12, 1998
Supersedes: May 18, 1995
MSDS Number: 08529

1. PRODUCT INFORMATION

Product Identifier: LIGHT DISTILLATE
ESSO STOVE OIL (DYED OR CLEAR)
DIESEL ARCTIC (DYED OR CLEAR)
ESSO DIESEL DEW (DYED OR CLEAR)
ESSO DIESEL ARCTIC (DYED OR CLEAR)
ESSO STOVE QUALITY COMMERCIAL FUEL
ESSO STOVE QUALITY FURNACE FUEL
ESSO STOVE QUALITY HEATING OIL (DYED OR CLEAR)
STOVE QUALITY FURNACE FUEL
DIESEL 60 (DYED OR CLEAR)
DIESEL DEW (DYED OR CLEAR)
ESSO DIESEL 60 (DYED OR CLEAR)
ESSO DIESEL LIGHT (DYED OR CLEAR)
STOVE OIL (DYED OR CLEAR)
STOVE QUALITY HEATING OIL (DYED OR CLEAR)
ESSO DIESEL FUEL OIL 50 (DYED OR CLEAR)
DIESEL LOW SULFUR LIGHT (DYED OR CLEAR)
LIGHT DISTILLATE (LOW SULFUR)
STOVE QUALITY COMMERCIAL FUEL
DIESEL FUEL OIL 50 (DYED OR CLEAR)
DIESEL LIGHT (DYED OR CLEAR)
DIESEL LOW SULFUR LIGHT DYED EP
FURNACE LIGHT (DYED OR CLEAR)

Application and Use:
Multi-purpose fuel

Product Description:

A complex mixture of aliphatic, olefinic, naphthenic and aromatic hydrocarbons, and additives.

REGULATORY CLASSIFICATION

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

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT
All components of this product are either on the Domestic Substances List (DSL) or are exempt.

TDG INFORMATION (RAIL/ROAD):

Shipping Name: FUEL OIL
Class: 3
Packing Group: III
PIN Number: UN1202

Please be aware that other regulations may apply.

TELEPHONE NUMBERS

Emergency 24 hr. (519) 339-2145
Technical Info. (800) 268-3183

MANUFACTURER/SUPPLIER:

IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(416) 968-4111

---

2. REGULATED COMPONENTS

The following components are defined in accordance with sub-paragraph 13(a)(i) to (iv) or paragraph 14(a) of the Hazardous Products Act:

NAME	%	CAS #
Kerosene, straight run	0-100 V/V	8008-20-6 LD50:>5g/kg,oral,rat
Light Atmospheric Gas Oil	0-100 V/V	64741-44-2
Light Hydrocracked Distillate	0-100 V/V	64741-77-1

---

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid
Specific gravity: not available
Viscosity: 1.80 cSt at 40 deg C
Vapour Density: 4
Boiling Point: 180 to 320 deg C
Evaporation rate: <1 (1= n-butylacetate)
Solubility in water: negligible
Freezing/Pour Point: -39 deg C ASTM D97
Odour Threshold: not available
Vapour Pressure: 4 kPa at 38 deg C
Density: 0.85 g/cc at 15 deg C
Appearance/odour: White or pale yellow liquid, petroleum odour

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

Negligible hazard at normal temperatures (up to 38 deg C).
High vapour concentrations are irritating to the eyes, nose, throat and lungs; may cause headaches and dizziness; may be anesthetic and may cause other central nervous system effects.
Avoid breathing vapours or mists.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Low toxicity.
Irritating.

INGESTION:

Low toxicity.
Small amounts of this liquid drawn into the lungs from swallowing or vomiting may cause severe health effects (e.g. bronchopneumonia or pulmonary edema).

CHRONIC:

Lifetime skin painting tests indicate that materials of similar composition have produced skin cancer in experimental animals. The relationship of these results to humans has not been fully established.

ACUTE TOXICITY DATA:

Based on animal testing data from similar materials and products, the acute toxicity of this product is expected to be:

Oral	:	LD50 > 5000 mg/kg (Rat)
Dermal	:	LD50 > 2000 mg/kg (Rabbit)
Inhalation	:	LC50 > 2500 mg/m3 (Rat)

OCCUPATIONAL EXPOSURE LIMIT:

Manufacturer recommends:
100 ppm based on composition.

Local regulated limits may vary.

5. FIRST AID MEASURES

INHALATION:

In emergency situations use proper respiratory protection to immediately remove the affected victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Immediately flush with large amounts of water. Use soap if available. Remove contaminated clothing, including shoes, after flushing has begun. If irritation persists, seek medical attention.

INGESTION:

DO NOT induce vomiting since it is important that no amount of the material should enter the lungs (aspiration). Keep at rest. Get prompt medical attention.

6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:

The selection of personal protective equipment varies, depending upon conditions of use.
In open systems where contact is likely, wear safety goggles, chemical-resistant overalls, and chemically impervious gloves.
Where only incidental contact is likely, wear safety goggles, long sleeves, and chemical-resistant gloves.
Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.

HANDLING, STORAGE AND SHIPPING:

Keep containers closed. Handle and open containers with care.
Store in a cool, well ventilated place away from incompatible materials.
In keeping with good personal hygiene practices, wash hands thoroughly after handling the material.
Do not handle or store near an open flame, sources of heat, or sources of ignition.
Material will accumulate static charges which may cause a spark. Static charge build-up could become an ignition source. Use proper relaxation and grounding procedures.
Empty containers may contain product residue. Do not pressurize cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

LAND SPILL:

Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard.
Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust.
Recover by pumping (use an explosion proof motor or hand pump), or by using a suitable absorbent.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.
Take all additional action necessary to prevent and remedy the adverse effects of the spill.

WATER SPILL:

Remove from surface by skimming or with suitable absorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in unconfined waters.

Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.
Take all additional action necessary to prevent and remedy the adverse effects of the spill.

7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: 40 deg C PMCT ASTM D93

Autoignition: NA Flammable Limits: LEL: 0.7% UEL: 6.5%

GENERAL HAZARDS:

Combustible Liquid; may form combustible mixtures at or above the flash point.
Toxic gases will form upon combustion.
Static Discharge; material may accumulate static charges which may cause a fire.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel.
Shut off fuel to fire.
Use foam, dry chemical or water spray to extinguish fire.
Respiratory and eye protection required for fire fighting personnel.
Avoid spraying water directly into storage containers due to danger of boilover.
A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke, carbon monoxide, carbon dioxide, oxides of sulphur.
In addition, small amounts of nitrogen oxides will be formed.

8. REACTIVITY DATA

STABILITY:

This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents. Use product with caution around heat, sparks, pilo lights, static electricity and open flames.

HAZARDOUS DECOMPOSITION:

none

9. NOTES

All components of this product are listed on the U.S. TSCA inventory.

Three year WHMIS review.
This MSDS has been revised in Sections 1, 3, 7 and 8.

10. PREPARATION

Date Prepared: May 12, 1998
Prepared by: Lubricants & Specialties
IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(800) 268-3183

CAUTION: " The information contained herein relates only to this product or material and may not be valid when used in combination with any other product or material or in any process. If the product is not to be used for a purpose or under conditions which are normal or reasonably foreseeable, this information cannot be relied upon as complete or applicable. For greater certainty, uses other than those described in Section 1 must be reviewed with the supplier. The information contained herein is based on the information available at the indicated date of preparation. This MSDS is for the use of Imperial Oil customers and their employees and agents only. Any further distribution of this MSDS by Imperial Oil customers is prohibited without the written consent of Imperial Oil."

ETHYLENE GLYCOL

M S D S

Canadian Centre for Occupational Health and Safety

Issue : 2001-1 (February, 2001)

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2438150
PRODUCT NAME(S) : SIPEG40-UHQ
SIPEG35-UHQ
SIPEG35-HQ
SIPEG40-HQ
1, 3-Benzenedicarboxylic Acid, 5-Sulfo, 1, 3-Bis (2-Hydroxy-
Ethyl) Ester, Sodium Salt, Solution in Ethylene Glycol
Isophthalic Acid, 5-Sulfo, Sodium Salt, Solution in Ethylene
Glycol
EGSIP Solution
SIPEG
PRODUCT IDENTIFICATION : MSDS NUMBER: CEC01360
DATE OF MSDS : 2000-05-25
CURRENCY NOTE : This MSDS was provided to CCOHS in electronic form on 2000-10-30

*** MANUFACTURER INFORMATION ***

MANUFACTURER : DuPont Canada, Inc
ADDRESS : Post Office Box 2200
Streetsville
Mississauga Ontario
Canada L5M 2H3
Telephone: 800-387-2122 (Product Information)
EMERGENCY TELEPHONE NO. : 613-348-3616 (Transport, 24 HOURS)
613-348-3616 (Medical, 24 HOURS)

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : DuPont Canada, Inc
ADDRESS : Post Office Box 2200
Streetsville
Mississauga Ontario
Canada L5M 2H3
Telephone: 800-387-2122 (Product Information)
EMERGENCY TELEPHONE NO. : 613-348-3616 (Transport, 24 HOURS)
613-348-3616 (Medical, 24 HOURS)

SIPEG
CEC01360 Revised 25-MAY-2000 Printed 18-JUL-2000

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

Corporate MSDS Number	: DU007173
Formula	: (HOCH2CH2O2C)2-C6H3-SO3Na
Molecular Weight	: 356.29
CAS Name	: 1,3-Benzenedicarboxylic acid, 5-sulfo, 1, 3-bis(2-hydroxy- ethyl)ester, monosodium salt, solution in 1,2-ethanediol

Tradenames and Synonyms

SIPEG40-UHQ
SIPEG35-UHQ
SIPEG35-HQ
SIPEG40-HQ
1,3-Benzenedicarboxylic Acid, 5-Sulfo, 1,3-Bis(2-Hydroxy-Ethyl) Ester, Sodium Salt, Solution in Ethylene Glycol
Isophthalic Acid, 5-Sulfo, Sodium Salt, Solution in Ethylene Glycol
EGSIP Solution
NA-SIPEG

Company Identification

MANUFACTURER/DISTRIBUTOR

DuPont Canada, Inc.
P.O. Box 2200
Streetsville
Mississauga, Ontario L5M 2H3

PHONE NUMBERS

Product Information	: 1-800-387-2122
Transport Emergency	: 1-613-348-3616 (24 HOURS)
Medical Emergency	: 1-613-348-3616 (24 HOURS)

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
1,3-Benbenedicarboxylic Acid, 5-Sulfo, 1,3-Bis(2-Hydroxyethyl)Ester, Monosodium Salt	24019-46-3	25-40 WT%
*1,2-Ethanediol	107-21-1	60-75 WT%

(COMPOSITION/INFORMATION ON INGREDIENTS - Continued)

* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

HAZARDS IDENTIFICATION

Potential Health Effects

Skin contact may cause skin irritation with itching, burning, redness, swelling or rash. Skin permeation may occur in amounts capable of producing the effects of systemic toxicity. There are no reports of human sensitization.

Eye contact may cause eye irritation with discomfort, tearing, or blurring of vision.

Inhalation of Ethylene Glycol may cause irritation of the nose and throat with sneezing, sore throat or runny nose. Gross overexposure may cause pulmonary edema (body fluid in the lungs) with cough, wheezing, abnormal lung sounds, possibly progressing to severe shortness of breath and bluish discoloration of the skin; symptoms may be delayed.

The estimated mean oral lethal dose of Ethylene Glycol in adult humans is 100 mL.

Inhalation or ingestion of Ethylene Glycol may cause headache, nausea. Gross overexposure may cause central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness, convulsions, altered kidney function which may be accompanied by abnormal urine volume, low back pain, discomfort or edema, kidney failure, deposits of calcium oxalate in the brain, spinal cord and kidneys, liver abnormalities, high blood pressure, irregular heart beat with a strange sensation in the chest,

"heart thumping", apprehension, lightheadedness, feeling of fainting, dizziness, weakness, sometimes progressing to loss of consciousness and death, congestive heart failure, retention of acid in the blood, making oxygen less available in the blood stream and leading to symptoms of increased breathing rate, nausea, vomiting, confusion and weakness which may progress to loss of consciousness; low blood sugar, low blood calcium with muscle twitching, involuntary movement of the eyes, facial paralysis. Other effects include fatality. No increases in chromosomal changes were noted in the circulating blood of exposed workers.

Individuals with preexisting diseases of the kidneys may have increased susceptibility to the toxicity of excessive exposures.

Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

FIRST AID MEASURES

First Aid

INHALATION

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

If swallowed, immediately give 2 glasses of water and induce vomiting. Never give anything by mouth to an unconscious person. Call a physician.

Notes to Physicians

Ethanol (ETOH) is antidotal and should be administered early in the treatment. Ethanol is a potent inhibitor of Ethylene Glycol metabolism because it is preferentially acted on by liver alcohol dehydrogenase, thus delaying or preventing toxic metabolites from Ethylene Glycol.

Treatment is started after residual ingested substance is removed from the stomach. Ethanol is administered orally or IV with a goal of maintaining a blood alcohol level of approximately 22 mmol/L or 1.0 mg/L.

To prepare antidote, make a solution using 100 mL of 100 proof ethyl alcohol and 1900 mL of water. Give 1.5 mL/kg or 100 mL for an average adult. This may be mixed with orange juice for oral use if necessary. More Ethanol is to be given at 2 hour intervals to achieve and maintain the desired blood alcohol levels. Treatment may be necessary for several days.

The patient should be monitored for metabolic acidosis. Use of appropriate buffering solutions, such as bicarbonate, may be indicated.

Hemodialysis may be required.

FIRE FIGHTING MEASURES

Flammable Properties

Flash Point	: 115.6 C (240.1 F)
Method	: Tag Open Cup - TOC.
Flammable limits in Air, % by Volume	
LEL	: 3.2 %
UEL	: 15.3 %
Autoignition	: 413 C (775 F)

The above data is for pure Ethylene Glycol.

Extinguishing Media

Dry Chemical, CO2.

Fire Fighting Instructions

Wear self-contained breathing apparatus (SCBA) and full protective equipment.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Eliminate all sources of ignition - heat, sparks, flame, electricity, impact and friction.

Initial Containment

Dike spill. Prevent material from entering sewers, waterways, or low areas.

Spill Clean Up

Soak up with sawdust, sand, oil dry or other absorbent material.

Accidental Release Measures

The CERCLA Reportable Quantity of Ethylene Glycol is 5,000 lbs.

HANDLING AND STORAGE

Handling (Personnel)

Avoid breathing vapors or mist. Avoid contact with eyes, skin or clothing. Wash thoroughly after handling.

Storage

Keep away from heat, sparks and flames. Close container after each use.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal Protective Equipment

EYE/FACE PROTECTION

Wear safety glasses or coverall chemical splash goggles.

RESPIRATOR

Where there is potential for airborne exposure, wear appropriate NIOSH approved respiratory protection.

PROTECTIVE CLOTHING

Where there is potential for skin contact have available, and wear as appropriate, impervious gloves, apron, pants, and jacket.

Exposure Guidelines

Applicable Exposure Limits

1,2-Ethanediol

PEL	(OSHA)	: None Established
TLV	(ACGIH)	: Ceiling: 39.4 ppm, 100 mg/m3, aerosol,A4
AEL *	(DuPont)	: 50 ppm, 8 Hr. TWA, vapor 10 mg/m3, 8 Hr. TWA, particulate

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point	: 197.6 C (387.7 F) @ 760 mm Hg (Ethylene Glycol)
Vapor Pressure	: 0.1 mm Hg @ 25 C (77 F) (Ethylene Glycol)
Vapor Density	: 2.14 (Air=1.0) (Ethylene Glycol)
Freezing Point	: -13 C (9 F) (Ethylene Glycol)
% Volatiles	: Negligible

CEC01360 Solubility in Water : 100 %

pH	: 6-8 @ 558 g/L H20 Ethylene Glycol
Odor	: Mild.
Form	: Viscous Liquid.
Color	: Colorless to Light Yellow.
Specific Gravity	: 1.115 g/cm3 @ 20 C (68 F) (Ethylene Glycol)

STABILITY AND REACTIVITY

Chemical Stability

Stable at normal temperatures and storage conditions.

Incompatibility with Other Materials

None reasonably foreseeable.

Decomposition

Decomposition will not occur.

Polymerization

Polymerization can occur. (Not violent or strongly exothermic.) Extended heating at high temperatures (>200 degC).

TOXICOLOGICAL INFORMATION

Animal Data

1,2-Ethanediol:

Oral LD50:	4,000 mg/kg in female rats
Dermal LD50:	>20 mL/kg in rabbits

SIPEG did not produce genetic damage in bacterial cell cultures.

1,2-Ethanediol is a mild skin irritant and mild eye irritant, and is untested for skin sensitization in animals. Repeated exposure by ingestion caused histopathological changes of the kidneys, bone marrow, kidney effects with oxalate crystal deposition, altered hematology, decreased body weight. Long-term exposure caused kidney effects with oxalate crystal deposition, histopathological changes of the kidneys, liver, blood vessels, testes, sperm, decreased body weight. No deaths occurred in animals exposed to saturated vapors of the compound. Repeated exposure by inhalation caused histopathological changes of the liver, lungs, eye

irritation, clouding of the eye (corneal opacity). In animal testing this material has not caused carcinogenicity. Reproductive data on adult animals show interference with reproduction only at levels which produce other toxic effects in the adult animal. Tests have shown this material to cause developmental toxicity in animals. This material has not produced genetic damage in bacterial cultures. There are reports indicating that this material does not produce genetic damage in some animal or mammalian cell culture tests; however, there are reports in the literature that suggest positive results.

ECOLOGICAL INFORMATION

Ecotoxicological Information

Ethylene Glycol:
96 hour LC50, Fathead minnows: 49,000 mg/L

DISPOSAL CONSIDERATIONS

Waste Disposal

Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

TRANSPORTATION INFORMATION

Shipping Information

DOT/IMO/IATA : Not Regulated in Containers with less than 5,000 lbs. Ethylene Glycol

If greater than 5,000 lbs. Ethylene Glycol, use:

DOT/IMO/IATA
Proper Shipping Name : Environmentally Hazardous Substance, Liquid, N.O.S. (Contains Ethylene Glycol)
Hazard Class : 9

UN Number : 3082
Packing Group : III
Label : Class 9
Reportable Quantity : 5,000 lbs. Ethylene Glycol

Shipping Information -- Canada

This material is Not Regulated.

REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status : Listed.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes
Chronic : Yes
Fire : No
Reactivity : No
Pressure : No

Canadian Regulations

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

Not listed on the Canadian Domestic Substances List (DSL).

OTHER INFORMATION

NFPA, NPCA-HMIS

NPCA-HMIS Rating
Health : 2
Flammability : 1
Reactivity : 0

Personal Protection rating to be supplied by user depending on use conditions.

Additional Information

This product contains polymer-grade ethylene glycol.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS

CHEMICALS
DuPont Canada Inc.
7070 Mississauga Rd.
Mississauga, Ontario, L5M 2H3
(905) 821-5369.

End of MSDS

GASOLINE (GENERIC)

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                       M S D S                         *
*                                                       *
*  Canadian Centre for Occupational Health and Safety   *
* * * * * * * * * * * * Issue : 2001-1 (February, 2001) *
```

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2461632
PRODUCT NAME(S) : GASOLINE (GENERIC)
PRODUCT IDENTIFICATION : MSDS Number: 002914
DATE OF MSDS : 2000-07-22
CURRENCY NOTE : This MSDS was provided to CCOHS in electronic form on 2000-10-03

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Chevron Products Company
ADDRESS : 6001 Bollinger Canyon Road
San Ramon California
U.S.A. 94583
Telephone: 800-689-3998 (Product Information, MSDS Requests) 510-242-5357 (Product Information, Technical Information)
EMERGENCY TELEPHONE NO. : 800-231-0623 (Health, 24 hr)
510-231-0623 (International, Health, 24 hr)
800-424-9300 (CHEMTREC, Transportation, 24 hr)
703-527-3887 (Transportation 24hr, Emergency Info Centers are in USA, Int'l collect calls accepted)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

GASOLINE (GENERIC)

COMPANY IDENTIFICATION	EMERGENCY TELEPHONE NUMBERS
Chevron Products Company Marketing, MSDS Coordinator 6001 Bollinger Canyon Road San Ramon, CA 94583	HEALTH (24 hr): (800)231-0623 or (510)231-0623 (International) TRANSPORTATION (24 hr): CHEMTREC (800)424-9300 or (703)527-3887 Emergency Information Centers are located in U.S.A. Int'l collect calls accepted

PRODUCT INFORMATION: (800)689-3998 MSDS Requests and Product Information

Revision Number: 14 Revision Date: 07/22/00 MSDS Number: 002914

2. COMPOSITION/INFORMATION ON INGREDIENTS

100.0 % GASOLINE (GENERIC)

CONTAINING

COMPONENTS	AMOUNT	LIMIT/QTY	AGENCY/TYPE
GASOLINE (GENERIC)	100.00%	890 mg/m3	ACGIH TWA
		1480 mg/m3	ACGIH STEL
		2000 mg/m3	OSHA PEL

POTENTIALLY

INCLUDING

BENZENE			
Chemical Name: BENZENE			
CAS71432	< 5.00%	0.5 ppm	ACGIH TWA

		2.5 ppm	ACGIH STEL
		1 ppm	OSHA PEL
		5 ppm	OSHA CEILING
		10 LBS	CERCLA 302.4 RQ
ETHYL BENZENE			
Chemical Name: BENZENE, ETHYL-			
CAS100414		100 ppm	ACGIH TWA
		125 ppm	ACGIH STEL
		100 ppm	OSHA PEL
		1,000 LBS	CERCLA 302.4 RQ
XYLENE			
Chemical Name: BENZENE, DIMETHYL-			
CAS1330207		100 ppm	ACGIH TWA
		150 ppm	ACGIH STEL
		100 ppm	OSHA PEL
		100 LBS	CERCLA 302.4 RQ
TOLUENE			
Chemical Name: TOLUENE			
CAS108883		50 ppm	ACGIH TWA
		200 ppm	OSHA PEL

	300 ppm	OSHA CEILING
	1,000 LBS	CERCLA 302.4 RQ
N-BUTANE		
Chemical Name: N-BUTANE		
CAS106978	800 ppm	ACGIH TWA
N-HEPTANE		
Chemical Name: N-HEPTANE		
CAS142825	400 ppm	ACGIH TWA
	500 ppm	ACGIH STEL
	500 ppm	OSHA PEL
N-HEXANE		
Chemical Name: N-HEXANE		
CAS110543	50 ppm	ACGIH TWA
	500 ppm	OSHA PEL
	5,000 LBS	CERCLA 302.4 RQ
HEXANE ISOMERS (OTHER THAN N)		
HEXANES		
	500 ppm	ACGIH TWA
	1000 ppm	ACGIH STEL
PENTANE (ALL ISOMERS)		
PENTANES		
	600 ppm	ACGIH TWA
	750 ppm	ACGIH STEL
	1000 ppm	OSHA PEL
CYCLOHEXANE		
Chemical Name: CYCLOHEXANE		
CAS110827	300 ppm	ACGIH TWA
	300 ppm	OSHA PEL
	1,000 LBS	CERCLA 302.4 RQ
METHYLCYCLOHEXANE		
Chemical Name: CYCLOHEXANE, METHYL		
CAS108872	400 ppm	ACGIH TWA
	500 ppm	OSHA PEL
TRIMETHYLBENZENE		
Chemical Name: BENZENE, TRIMETHYL-		
CAS25551137	25 ppm	ACGIH TWA
2,2,4-TRIMETHYLPENTANE		
Chemical Name: 2,2,4-TRIMETHYLPENTANE		
CAS540841	1,000 LBS	CERCLA 302.4 RQ

CAN CONTAIN

METHYL TERT BUTYL ETHER (MTBE)
Chemical Name: 2-METHOXY-2-METHYL PROPANE

CAS1634044	< 15.00%	40 ppm	ACGIH TWA
		50 ppm	Chevron STEL
		1,000 LBS	CERCLA 302.4 RQ

ETHYL TERT BUTYL ETHER (ETBE)
Chemical Name: 2-ETHOXY-2-METHYL PROPANE

CAS637923	< 18.00%	NONE	NA

TERT-AMYL METHYL ETHER (TAME)
Chemical Name: 2-METHOXY-2-METHYL-BUTANE

CAS994058	< 17.00%	50 ppm	Chevron STEL

OR

ETHANOL
Chemical Name: ETHYL ALCOHOL

CAS64175	< 10.00%	1000 ppm	ACGIH TWA
		1000 ppm	OSHA PEL

COMPOSITION COMMENT:
Refer to the OSHA Benzene Standard (29 CFR 1910.1028) and Table Z-2 for detailed training, exposure monitoring, respiratory protection and medical surveillance requirements before using this product.

Motor gasoline is considered a mixture by EPA under the Toxic Substances Control Act (TSCA). The refinery streams used to blend motor gasoline are all on the TSCA Chemical Substances Inventory. The appropriate CAS number for refinery blended motor gasoline is 86290-81-5. The product specifications of motor gasoline sold in your area will depend on applicable Federal and State regulations. Ethyl Alcohol is only added in limited specific distribution areas.

Revision Number: 14 Revision Date: 07/22/00 MSDS Number: 002914

3. HAZARDS IDENTIFICATION

********** EMERGENCY OVERVIEW **********

Variable colored liquid with a petroleum hydrocarbon odor.

- EXTREMELY FLAMMABLE
- HARMFUL OR FATAL IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE
- VAPOR HARMFUL

Revision Number: 14 Revision Date: 07/22/00 MSDS Number: 002914

- MAY CAUSE EYE AND SKIN IRRITATION
- LONG-TERM EXPOSURE TO VAPOR HAS CAUSED CANCER IN LABORATORY ANIMALS
- KEEP OUT OF REACH OF CHILDREN

****

IMMEDIATE HEALTH EFFECTS

EYE:
Contact with the eyes causes irritation. Eye contact with the vapors, fumes, or spray mist from this substance could also cause similar signs and symptoms.

SKIN:
Contact with the skin causes irritation. Not expected to be harmful to internal organs if absorbed through the skin. Prolonged or frequently repeated contact may cause the skin to become cracked or dry from the defatting action of this material.

INGESTION:
Because of the low viscosity of this substance, it can directly enter the lungs if it is swallowed (this is called aspiration). This can occur during the act of swallowing or when vomiting the substance. Once in the lungs, the substance is very difficult to remove and can cause severe injury to the lungs and death.

INHALATION:
May be harmful if inhaled. Breathing the vapors at concentrations above the recommended exposure standard can cause central nervous system effects. The vapor or fumes from this material may cause respiratory irritation.

SIGNS AND SYMPTOMS OF EXPOSURE:
Eye damage or irritation: may include pain, tearing, reddening, swelling, and impaired vision. Skin injury: may include pain, discoloration, swelling, and blistering. Respiratory irritation: may include coughing and difficulty breathing. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

CARCINOGENICITY:
Risk depends on duration and level of exposure. See Section 11 for additional information. Gasoline has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC). Contains chemical(s) known to the State of California to cause cancer. Contains benzene, which has been classified as a carcinogen by the National Toxicology Program (NTP), and a Group 1 carcinogen (carcinogenic to humans) by the International Agency for Research on Cancer (IARC). Contains ethylbenzene which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on

Cancer (IARC).
Whole gasoline exhaust was reviewed by the International Agency for Research on Cancer (IARC) in their Monograph Volume 46 (1989). Evidence for causing cancer was considered inadequate in animals and inadequate in humans. IARC placed whole gasoline exhaust in Category 2B, considering it possibly carcinogenic to humans.

4. FIRST AID MEASURES

EYE:
Flush eyes with water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.

SKIN:
Wash skin immediately with soap and water and remove contaminated clothing and shoes. Get medical attention if irritation persists. Discard contaminated clothing and shoes or thoroughly clean before reuse.

INGESTION:
If swallowed, give water or milk to drink and telephone for medical advice. DO NOT make person vomit unless directed to do so by medical personnel. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

INHALATION:
Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.
NOTE TO PHYSICIANS:
Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid which can cause pneumonitis.

5. FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:
OSHA Classification (29 CFR 1910.1200): Flammable liquid. See section 7 for appropriate handling and storage conditions.
FLAMMABLE PROPERTIES:
FLASH POINT: (TCC) < -49F (<-45C)
AUTOIGNITION: 536F (280C)
FLAMMABILITY LIMITS (% by volume in air): Lower: 1.4 Upper: 7.6

EXTINGUISHING MEDIA:
CO2, Dry Chemical, Fire Fighting Foam, AFFF.
NFPA RATINGS: Health 1; Flammability 3; Reactivity 0.

FIRE FIGHTING INSTRUCTIONS:
Use water spray to cool fire-exposed containers and to protect personnel. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

COMBUSTION PRODUCTS:
Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

6. ACCIDENTAL RELEASE MEASURES

CHEMTREC EMERGENCY NUMBER (24 hr): (800)424-9300 or (703)527-3887
International Collect Calls Accepted

ACCIDENTAL RELEASE MEASURES:
Eliminate all sources of ignition in the vicinity of the spill or released vapor. Stop the source of the leak or release. Clean up releases as soon as possible, observing precautions in Exposure Controls/Personal Protection. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

Release of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems. U.S.A. regulations require reporting spills of this material that could reach any surface waters. The toll free number for the U.S. Coast Guard National Response Center is (800) 424-8802.

7. HANDLING AND STORAGE

This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights,

welding equipment, and electrical motors and switches.

Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, "Flammable and Combustible Liquids", National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity", and/or the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents".

Improper filling of portable gasoline containers creates danger of fire. Only dispense gasoline into approved and properly labeled gasoline containers. Always place portable containers on the ground. Be sure pump nozzle is in contact with the container while filling. Do not use a nozzle's lock-open device. Do not fill portable containers that are inside a vehicle or truck/trailer bed.

Never siphon gasoline by mouth. Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel, or any other such use. DO NOT USE OR STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use. READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.

Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, 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. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner, or properly disposed of.

Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Do not breathe mist. Wash thoroughly after handling.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should

read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT
EYE/FACE PROTECTION:
No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

SKIN PROTECTION:
No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted,

physical requirements and other substances. Suggested materials for protective gloves include: <Nitrile> <Polyurethane> <Viton> <Chlorinated Polyethylene (or Chlorosulfonated Polyethylene or CPE)>

RESPIRATORY PROTECTION:
Determine if airborne concentrations are below the recommended exposure limits. If not, wear a NIOSH approved respirator that provides adequate protection from measured concentrations of this material. Use the following respirators: Organic Vapor. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION:
Variable colored liquid with a petroleum hydrocarbon odor.

pH:	NA
VAPOR PRESSURE:	5 - 15 PSI @ 100F (REID)
VAPOR DENSITY (AIR=1):	3-4
BOILING POINT:	25 - 225C (range)
FREEZING POINT:	NA
MELTING POINT:	NA
SOLUBILITY:	Soluble in hydrocarbons; insoluble in water.
SPECIFIC GRAVITY:	0.7 - 0.8 @ 15.6/15.6C
PERCENT VOLATILE (VOL):	99+%

10. STABILITY AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:
None known
CHEMICAL STABILITY:
Stable.
CONDITIONS TO AVOID:
See section 7.
INCOMPATIBILITY WITH OTHER MATERIALS:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
HAZARDOUS POLYMERIZATION:
Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS:
The mean 24-hour Draize eye irritation score in rabbits is 0.

SKIN EFFECTS:
This material was not a skin sensitizer in the modified Buehler Guinea Pig Sensitization Test. For a 4-hour exposure, the Primary Irritation Index (PII) in rabbits is: 4.8.

ACUTE ORAL EFFECTS:
The oral LD50 in rats is > 5 ml/kg.

ACUTE INHALATION EFFECTS:
No product toxicology data available.

ADDITIONAL TOXICOLOGY INFORMATION:
When vapor exposures are low, or short duration and infrequent, such as during refuelling and tanker loading/unloading, neither total hydrocarbon nor components such as benzene are likely to result in any adverse health effects. In situations such as accidents or spills where exposure to gasoline vapor and liquid is potentially high, attention should be paid to potential toxic effects of specific components in addition to those of total hydrocarbons. Information about specific components in gasoline are found in Section 1 and Section 15 of this MSDS. More detailed information on the health hazard of specific gasoline components can be obtain from the Chevron Emergency Information Center (see Section 1 for telephone numbers).

A study was done in which ten volunteers were exposed for 30 minutes to about 200, 500 or 1000 ppm concentrations of the vapor of three different

unleaded gasolines. Irritation of the eyes was the only significant effect observed, based on both subjective and objective assessments.

An inhalation study with rats exposed to 0, 400 and 1600 ppm of wholly vaporized unleaded gasoline, 6 hours per day on day 6 through 16 of gestation, showed no teratogenic effects nor indication of toxicity to either the mother or the fetus (sex ratio, embryotoxicity, fetal growth and development).

An inhalation study with pregnant rats exposed to 0, 1000, 3000, and 9000 ppm of unleaded gasoline vapor, 6 hours per day on days 6 through 20 of gestation, showed no teratogenic effects nor indications of toxicity to either the mother or the fetus.

In an inhalation study, groups of 6 Fischer rats (3 male, 3 female) were exposed to 2056 ppm of wholly vaporized unleaded gasoline for 6 hours per day, 5 day per week for up to 18 months. Histopathology of the peripheral nervous system and spinal cord revealed no distal axonal neuropathy of the type associated with exposure to n-hexane even though gasoline contained 1.9% n-hexane. The authors concluded that gasoline treatment may have amplified the incidence and prominence of some naturally occurring age related changes in the nervous system.

Wholly vaporized unleaded gasoline was used in a 3 month inhalation study. Groups of 40 rats (20 males, 20 female) and 8 squirrel monkeys (4 male, 4 female) were exposed 6 hours per day and 5 days per week for 13 weeks to 384 or 1552 ppm gasoline. One group of each species served as unexposed controls. The initial conclusion of this study was that inhalation of gasoline at airborne concentrations of up to 1522 ppm caused no toxicity in rats or monkeys. However, further histopathological examination of male rat kidneys on the highest dose group revealed an increased incidence and severity of regenerative epithelium and dilated tubules containing proteinaceous deposits.

Rabbits were exposed to unleaded gasoline 24 hour per day, 5 days per week for two weeks; 0, 2.5, 5 or 8 ml were applied to the skin under an occlusive dressing. Applied in such a way, this motor gasoline was corrosive to the rabbit skin and animals in all dose groups had decreased bodyweights. The slight and/or isolated systemic effects noted in the study were judged to be not significant.

Unleaded gasoline was assayed for mutagenic and cytogenetic activity. Gasoline was not mutagenic, either with or without activation, in Ames assay (Salmonella typhimurium), Saccharamyces cerevisesae, or mouse lymphoma assays. In addition, point mutations were not induced in human lymphocytes exposed to gasoline in vivo. The gasoline was not mutagenic when tested in the mouse dominant lethal assay. Administration of gasoline to rats did not cause chromosomal aberrations in their bone marrow cells.

In a lifetime skin painting study, 50 male Swiss mice were treated with 0.05 ml of unleaded gasoline three times per week. Positive control groups were treated with benzo(a)pyrene in acetone; an untreated negative

control group was also included. The repeated exposure to gasoline caused severe skin irritation, ulceration, hyperkeratosis and abscesses. There was no statistically significant increase in the incidence of skin tumors. Histopathology at the end of the study showed that unleaded gasoline did not increase the incidence of tumors in other organs.

Lifetime inhalation of wholly vaporized unleaded gasoline at 2056 ppm has caused increased liver tumors in female mice. The mechanism of this response is still being investigated but is thought to be an epigenetic process unique to the female mouse. This exposure also caused kidney damage and eventually kidney cancer in male rats. No other animal model studied has shown these adverse kidney effects and there is no physiological reason to believe that they would occur in man. EPA has concluded that the mechanism by which wholly vaporzied unleaded gasoline causes kidney damage is unique to the male rat. The response in that species (kidney damage and cancer) should not be used in human risk assessment.

In their 1988 review of carcinogenic risk from gasoline, The Internatioal Agency for Research on Cancer (IARC) noted that, because published epidemiology studies did not include any exposure data, only occupations where gasoline exposure may have occurred were reviewed. These included gasoline service station attendants and automobile mechanics. IARC also noted that there was no opportunity to separate effects of combustion products from those of gasoline itself. Although IARC allocated gasoline a final overall classification of Group 2B, i.e. possibly carcinogenic to humans, this was based on limited evidence in experimental animals plus supporting evidence including the presence in gasoline of benzene and 1, 3-butadiene. The actual evidence for cacinogenicity in humans was considered inadequate.

To explore the health effects of workers potentially exposed to gasoline vapors in the marketing and distribution sectors of the petroleum industry, the American Petroleum Institute sponsored a cohort mortality, a nested case-control, and an exposure assessment study. Histories of exposure to gasoline were reconstructed for a cohort of more than 18,000 employees from four companies for the time period between 1946 and 1985. Data were analyzed based on length of employment, length of exposure, job category, age at first exposure and estimated cumulative and peak exposures. Cumulative exposure was defined as the sum of products of TWA exposure and duration of exposure of each job in an employee's work history. Amoung cohort members, cumulative exposure ranged from 2 to 8,000 ppm-years. In general, long-term drivers at small terminals had the highest exposures, and short-term workers with "other terminal jobs" had the lowest. A peak exposure was defined as an episode in excess of 500 ppm lasting 15 to 90 minutes.

The results of the cohort study indicated that there was no increased mortality from either kidney cancer or leukemia among marketing and marine distribution employees who were exposed to gasoline in the petroleum industry, when compared to the general population. More importantly, based on internal comparisons, there was no association between mortality from kidney cancer or leukemia and various indices of gasoline exposure.

For acute myeloid leukemia (AML), a non-significant mortality increase was

found in land-based terminal employees, but no trend was detected when the data were analyzed by various gasoline exposure indices. This non-significant excess was limited to land-based terminal employees hired prior to 1948. On the other hand, a deficit of mortality from AML was observed among marine employees.

In addition to the cohort study, a subsequent nested case-control study was also conducted. Four diseases were selected for analysis in the case-control study: Leukemia (all cell types), AML, kidney cancer and multiple myeloma. For each case, five individually matched controls were randomly selected from the cohort. In the original cohort study, broad generic job categories were used as part of exposure assessment. In the case-control study, a finer and more homogeneous job classification was developed. In addition to job category, several quantitative gasoline exposure indices were used in the case-control analysis: length of exposure, cumulative exposure (ppm-years in terms of total hydrocarbons) and frequency of peak exposure. Time period of first exposure to gasoline (1948 or before and 1949 or after) was also included as an exposure index. Results of the nested case-control study confirmed the findings of the original cohort study. That is, exposure to gasoline at the levels experienced by this cohort of distribution workers is not a significant risk factor for leukemia (all cell types), acute myeloid leukemia, kidney cancer or multiple myeloma.

12. ECOLOGICAL INFORMATION

ECOTOXICITY:
Gasoline studies have been conducted in the laboratory under a variety of test conditions with a range of fish and invertebrate species. An even more extensive database is available on the aquatic toxicity of individual aromatic constituents. The majority of published studies do not identify the type of gasoline evaluated, or even provide distinguishing characteristics such as aromatic content or presence of lead alkyls. As a result, comparison of results among studies using open and closed vessels, different ages and species of test animals and different gasoline types, is difficult.

The bulk of the available literature on gasoline relates to the environmental impact of monoaromatic (BTEX) and diaromatic (naphthalene, methylnaphthalenes) constituents. In general, non-oxygenated gasoline exhibits some short-term toxicity to freshwater and marine organisms, especially under closed vessel or flow-through exposure conditions in the laboratory. The components which are the most prominent in the water soluble fraction and cause aquatic toxicity, are also highly volatile and can be readily biodegraded by microorganisms.

The 96-hour LC50 in rainbow trout (Oncorhynchus mykiss) is 2.7 mg/l (BTEX). The 48-hour LC50 in daphnia (Daphnia magna) is 3.0 mg/l (BTEX). The 96-hour LC50 in sheepshead minnow (Cyprinodon variegatus) is 8.3 mg/l

(BTEX). The 96-hour LC50 in mysid shrimp (Mysidopsis bahia) is 1.8 mg/l (BTEX).

ENVIRONMENTAL FATE:
Following spillage, the more volatile components of gasoline will be rapidly lost, with concurrent dissolution of these and other constituents into the water. Factors such as local environmental conditions (temperature, wind, mixing or wave action, soil type, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, can contribute to the weathering of spilled gasoline. The aqueous solubility of non-oxygenated unleaded gasoline, based on analysis of benzene, toluene, ethylbenzene+xylenes and naphthalene, is reported to be 112 mg/l. Solubility data on individual gasoline constituents also available.

13. DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible.

This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by USEPA under RCRA (40CFR261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

14. TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT SHIPPING NAME: GASOLINE
DOT HAZARD CLASS: 3 (FLAMMABLE LIQUID)
DOT IDENTIFICATION NUMBER: UN1203
DOT PACKING GROUP: II

15. REGULATORY INFORMATION

SARA 311 CATEGORIES:

1. Immediate (Acute) Health Effects: YES
2. Delayed (Chronic) Health Effects: YES
3. Fire Hazard: YES
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01=SARA 313	11=NJ RTK	22=TSCA Sect 5(a)(2)
02=MASS RTK	12=CERCLA 302.4	23=TSCA Sect 6
03=NTP Carcinogen	13=MN RTK	24=TSCA Sect 12(b)
04=CA Prop 65-Carcin	14=ACGIH TWA	25=TSCA Sect 8(a)
05=CA Prop 65-Repro Tox	15=ACGIH STEL	26=TSCA Sect 8(d)
06=IARC Group 1	16=ACGIH Calc TLV	27=TSCA Sect 4(a)
07=IARC Group 2A	17=OSHA PEL	28=Canadian WHMIS
08=IARC Group 2B	18=DOT Marine Pollutant	29=OSHA CEILING
09=SARA 302/304	19=Chevron TWA	30=Chevron STEL
10=PA RTK	20=EPA Carcinogen	

The following components of this material are found on the regulatory lists indicated.

BENZENE, ETHYL-
  is found on lists: 01,02,08,10,11,12,13,14,15,17,26,28,
N-BUTANE
  is found on lists: 02,10,11,13,14,28,
CYCLOHEXANE, METHYL
  is found on lists: 02,10,11,13,14,17,26,28,
TOLUENE
  is found on lists: 01,02,05,10,11,12,13,14,17,26,28,29,
N-HEXANE
  is found on lists: 01,02,10,11,12,13,14,17,27,28,
CYCLOHEXANE
  is found on lists: 01,02,10,11,12,13,14,17,26,28,
BENZENE, DIMETHYL-
  is found on lists: 01,02,10,11,12,13,14,15,17,
N-HEPTANE
  is found on lists: 02,10,11,13,14,15,17,26,28,
2-METHOXY-2-METHYL PROPANE
  is found on lists: 01,02,10,11,12,14,24,26,27,30,
BENZENE, TRIMETHYL-
  is found on lists: 02,10,11,13,14,26,28,
2,2,4-TRIMETHYLPENTANE
  is found on lists: 02,10,11,12,26,
2-ETHOXY-2-METHYL PROPANE

is found on lists: 25,26,
ETHYL ALCOHOL
is found on lists: 02,10,11,13,14,17,28,
BENZENE
is found on lists: 01,02,03,04,06,10,11,12,13,14,15,17,20,28,29,
2-METHOXY-2-METHYL-BUTANE
is found on lists: 24,25,26,27,30,
GASOLINE (GENERIC)
is found on lists: 04,08,14,15,17,
PENTANES
is found on lists: 14,15,17,
HEXANES
is found on lists: 14,15,

WHMIS CLASSIFICATION:
Class B, Division 2: Flammable Liquids
Class D, Division 2, Subdivision A: Very Toxic Material
-Carcinogenicity
Class D, Division 2, Subdivision B: Toxic Material
-Skin or Eye Irritation

16. OTHER INFORMATION

NFPA RATINGS: Health 1; Flammability 3; Reactivity 0;
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT:
This revision updates Sections 1, 3, 5, 7, 9, 15, & 16.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	- Threshold Limit Value	TWA	- Time Weighted Average
STEL	- Short-term Exposure Limit	TPQ	- Threshold Planning Quantity
RQ	- Reportable Quantity	PEL	- Permissible Exposure Limit
C	- Ceiling Limit	CAS	- Chemical Abstract Service Number
A1-5	- Appendix A Categories	()	- Change Has Been Proposed
NDA	- No Data Available	NA	- Not Applicable

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Toxicology and Health Risk Assessment Unit, CRTC, P.O. Box 1627, Richmond, CA 94804

****

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibil-ity for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

****
THIS IS THE LAST PAGE OF THIS MSDS
****

Revision Number: 14 Revision Date: 07/22/00 MSDS Number: 002914

GREASE

* *
* M S D S *
* *
* Canadian Centre for Occupational Health and Safety *
* * * * * * * * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 287372
PRODUCT NAME(S) : Inland 16350 High Vacuum Grease (Perfluorinated polyether thickened with fluorotelomer)
DATE OF MSDS : 1986-12-19
CURRENCY NOTE : MSDS Confirmed Current: 1997-05-13

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Inland Vacuum Industries
ADDRESS : 35 Howard Avenue
Churchville New York
U.S.A. 14428
EMERGENCY TELEPHONE NO. : 716-293-3330 (Days)
803-548-2346 (Evenings)

*** MATERIAL SAFETY DATA ***

IDENTITY Inland 16350 High Vacuum Grease (Perfluorinated polyether thickened with fluorotelomer)

SECTION I

PREPARATION DATE 12-19-86
PREPARER'S SIGNATURE

SECTION II HAZARDOUS INGREDIENTS AND IDENTITY INFORMATION

HAZARDOUS COMPONENT	OSHA PEL	ACGIH TLV	OTHER LIMITS	%(OPT)
Fluorine end-capped homopolymers of hexafluoropropylene epoxide thickened with fluorotelomers				100

SECTION III PHYSICAL AND CHEMICAL CHARACTERISTICS

BOILING POINT (deg C)	>200
SPECIFIC GRAVITY (H2O=1)	>1.90
VAPOR PRESSURE (Torr)	<.0001
MELTING POINT (deg C) (pour point)	-45 to -5
VAPOR DENSITY (AIR=1)	~70
EVAPORATION RATE (BUTYL ACETATE=1)	Nil
SOLUBILITY IN WATER	Nil
APPEARANCE AND ODOR	white dense, viscous fluid

SECTION VI FIRE AND EXPLOSION DATA

FLASH POINT (METHOD USE) None (Pensky-Martens Closed Cup)
FLAMMABLE LIMITS Not applicable LEL UEL
EXTINGUISHING MEDIA As appropriate for other combustibles in the area
SPECIAL FIRE FIGHTING PROCEDURES Wear breathing gear when fighting fires in enclosed areas because decomposition of Krytox at flame temperatures may form toxic fluorine compounds.
UNUSUAL FIRE AND EXPLOSION HAZARDS None

SECTION V REACTIVITY DATA

STABLE (Y/N) [Y] CONDITIONS TO AVOID
HAZARDOUS POLYMERIZATION (Y/N) [N] CONDITIONS TO AVOID
INCOMPATIBILITY No Incompatibilities are reasonably foreseen
HAZARDOUS DECOMPOSITION PRODUCTS See Health Hazard Information

SECTION VI HEALTH HAZARD DATA

ROUTES OF ENTRY: INHALATION: Not normally
SKIN: Yes
INGESTION: Not normally

HEALTH HAZARDS (ACUTE AND CHRONIC) Acute: May cause mild eye irritation and mild skin irritation. Inhalation of smoke from tobacco contaminated with this compound may cause throat irritation, cough and tightness in chest.
The known physiological effects of the separate ingredients of these materials indicate a very low order of toxicity in animals by skin contact (ALD >17000 mg/kg rabbits); by ingestion (ALD >25000mg/kg rats); and at-room-temperature inhalation (4 hr ALC 19.54 mg/l rats). Decomposition products formed at temperatures above 260 C are irritating to the lungs of animals. Pulmonary edema and death occurred in rats exposed to decomposition products may include lung irritation. Inhalation of decomposition products formed at ~290 C may required treatment of lung irritation for fluorine compounds which can cause

delayed pulmonary edema. Prolonged skin contact may cause redness and inflammation of hair follicles without sensitization.

CARCINOGENICITY NTP IARC MONOGRAPHS OSHA REGULATED
None of the components of this chemical is listed by IARC, NTP, or OSHA as a carcinogen.

SYMPTOMS OF EXPOSURE See above

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE Unknown

EMERGENCY FIRST AID PROCEDURES Inhalation - if inhaled remove to fresh air. If not breathing, give artificial respiration and call a physician. Skin contact - flush skin with water after prolonged or repeated contact. Eye contact - immediately flush eyes with plenty of water for at least 15 minutes. Call a physician. Ingestion - do not induce vomiting. Immediately give two glasses of water or activated charcoal slurry. Never give anything by mouth to an unconscious person.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Soak up spill with sawdust sand, oil-dry or other absorbent material. Remove sources of heat and flame. At 260-290 C material forms potentially toxic fluorine compounds. Avoid breathing any decomposition products. Place in container for disposal. Review other areas of this sheet for additional information.

WASTE DISPOSAL METHOD Dispose of in accordance with appropriate Federal, State and Local regulations. Do not flush liquid to surface water or sanitary sewer system.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING No special precautions..not regulated by DOT

OTHER PRECAUTIONS

SECTION VIII CONTROL MEASURES

RESPIRATORY PROTECTION (TYPE) should not be required when working with material under normal conditions

VENTILATION LOCAL SPECIAL
MECHANICAL OTHER

PROTECTIVE GLOVES Impermeable rubber gloves

EYE PROTECTION Goggles or safety glasses with side shields

OTHER PROTECTIVE EQUIPMENT n.a.

WORK/HYGENIC PRACTICES Keep containers tightly closed. Do not consume food or tobacco in areas where they could become contaminated with this material. Provide adequate ventilation. Keep material from heat and flame.

ISN: 287372

HYDRAULIC OIL

* *
* M S D S *
* *
* Canadian Centre for Occupational Health and Safety *
* * * * * * * * * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2313097
PRODUCT NAME(S) : BP AW HYDRAULIC OIL 32
LUBRICATING OIL; HYDRAULIC OIL
PRODUCT IDENTIFICATION : MSDS No. 0494105 US/ENGLISH
CAS NUMBER: 64741-88-4
DATE OF MSDS : 2000-01-24
CURRENCY NOTE : This MSDS was provided to CCOHS in electronic form on 2000-05-31

*** MANUFACTURER INFORMATION ***

MANUFACTURER : BP Lubricants
ADDRESS : 28100 Torch Parkway
Warrenville Illinois
U.S.A. 60555-4015
Telephone: 630-434-6377 (OTHER PRODUCT SAFETY INFORMATION)
EMERGENCY TELEPHONE NO. : 312-856-2200 (HEALTH INFORMATION, USA)
703-527-3887 (SPILL INFORMATION, CHEMTREC, USA)

*** MATERIAL SAFETY DATA ***

MSDS No. 0494105 US/ENGLISH

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER/SUPPLIER:
BP Lubricants
28100 Torch Parkway
Warrenville, Illinois 60555-4015
U.S.A.

EMERGENCY HEALTH INFORMATION:
1 (800) 447-8735

EMERGENCY SPILL INFORMATION:

1 (800) 424-9300 CHEMTREC (USA)

OTHER PRODUCT SAFETY INFORMATION:
1 (630) 434-6377 (USA)

SUBSTANCE: BP AW HYDRAULIC OIL 32

TRADE NAMES/SYNONYMS:
LUBRICATING OIL; HYDRAULIC OIL

CREATION DATE: Jan 24 2000

REVISION DATE: Feb 01 2000

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: SOLVENT-REFINED HEAVY PARAFFINIC DISTILLATE
CAS NUMBER: 64741-88-4
EC NUMBER (EINECS): 265-090-8
EC INDEX NUMBER: 649-454-00-7
PERCENTAGE: 98.0-100.0

(See Section 8, "Exposure Controls, Personal Protection", for exposure guidelines)

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=0 FIRE=1 REACTIVITY=0

EMERGENCY OVERVIEW:
COLOR: yellow
PHYSICAL FORM: oil
ODOR: hydrocarbon odor
MAJOR HEALTH HAZARDS: Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.

POTENTIAL HEALTH EFFECTS:
INHALATION:
No significant health hazards identified.
SKIN CONTACT:
Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis. High pressure skin injections are serious medical emergencies. Injury will not appear serious at first; within a few hours, tissue will become swollen, discolored and extremely painful.
EYE CONTACT:
No significant health hazards identified.
INGESTION:
Ingestion causes gastrointestinal irritation and diarrhea.

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Get medical attention.

SKIN CONTACT: Wash exposed skin with soap and water. Remove contaminated clothing and thoroughly clean and dry before reuse. Accidental high pressure injection through the skin requires immediate medical attention. Get medical attention if irritation develops.

EYE CONTACT: Flush eyes with plenty of water.

INGESTION: If swallowed, drink plenty of water. Get immediate medical attention. Induce vomiting only at the instructions of a physician. Do not

give anything by mouth to unconscious or convulsive person.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Slight fire hazard.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical, regular foam, water

FIRE FIGHTING: Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Water or foam may cause frothing.

FIRE FIGHTING PROTECTIVE EQUIPMENT: Firefighters should wear full bunker gear, including a positive pressure self contained breathing apparatus.

FLASH POINT: 468 F (242 C)
LOWER FLAMMABLE LIMIT: 1 % by volume
UPPER FLAMMABLE LIMIT: 7 % by volume

FLAMMABILITY CLASSIFICATION: Not Flammable.

HAZARDOUS COMBUSTION PRODUCTS:
Thermal decomposition products or combustion: hydrocarbons, oxides of carbon, oxides of nitrogen, oxides of phosphorus, oxides of sulfur, oxides of zinc

SECTION 6 ACCIDENTAL RELEASE MEASURES

Stop leak if possible without personal risk. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Keep unnecessary people away, isolate hazard area and deny entry. Large spills: Dike for later disposal. Cover with plastic sheet or tarp to minimize spreading and protect from contact with water. Prevent spreading by diking, ditching, or absorbing on inert materials.

SECTION 7 HANDLING AND STORAGE

STORAGE: Avoid extremes in storage temperatures. Store in a cool, dry, well-ventilated area. Store away from heat, ignition sources, and open flame in accordance with applicable regulations. Keep container tightly closed. Do not store in unlabeled containers.

HANDLING: Keep away from all ignition sources. Use only with adequate ventilation. Do not eat, drink or smoke in areas of use or storage. Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet facilities. Wash thoroughly after work using soap and water. Remove contaminated clothing and thoroughly clean and dry before reuse. SPECIAL PRECAUTIONS: Empty containers may contain toxic,

flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
SOLVENT-REFINED HEAVY PARAFFINIC DISTILLATE:
MINERAL OIL MIST:
5 mg/m3 OSHA TWA
5 mg/m3 ACGIH TWA (Notice of Intended Changes 1993-1994)
10 mg/m3 ACGIH STEL (Notice of Intended Changes 1993-1994)
5 mg/m3 MEXICO TWA
10 mg/m3 MEXICO STEL

VENTILATION: Use with adequate ventilation. Control airborne concentrations below the exposure guidelines.

EYE PROTECTION: None required; however, use of eye protection is good industrial practice.

CLOTHING: Avoid repeated or prolonged contact. Wear protective clothing if prolonged or repeated contact is likely.

GLOVES: Wear protective gloves if prolonged or repeated contact is likely.

PROTECTIVE MATERIAL TYPES: neoprene

RESPIRATOR: Use with adequate ventilation.
Avoid breathing vapor or mist.
If ventilation is inadequate, use a NIOSH certified respirator with an organic vapor cartridge and P95 particulate filter.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid
COLOR: yellow
PHYSICAL FORM: oil
ODOR: hydrocarbon odor
BOILING POINT: Not available
FREEZING POINT: Not available
POUR POINT: -26 F (-32 C)
VAPOR PRESSURE: <1 mmHg @ 20 C
VAPOR DENSITY (air=1): >1
SPECIFIC GRAVITY (water=1): 0.87
BULK DENSITY: 0.880 g/cm3
WATER SOLUBILITY: insoluble in cold water
PH: Not available

VOLATILITY: negligible
ODOR THRESHOLD: Not available
EVAPORATION RATE: slower than ether

VISCOSITY: 27.3 cP @ 40 C
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials.

INCOMPATIBILITIES: strong oxidizing materials

HAZARDOUS DECOMPOSITION:
Thermal decomposition products or combustion: hydrocarbons, oxides of carbon, oxides of nitrogen, oxides of phosphorus, oxides of sulfur, oxides of zinc

POLYMERIZATION: Will not polymerize.

SECTION 11 TOXICOLOGICAL INFORMATION

EYE IRRITATION: Testing not conducted. See Other Toxicity Data.

SKIN IRRITATION: Testing not conducted. See Other Toxicity Data.

DERMAL LD50: Testing not conducted. See Other Toxicity Data.

ORAL LD50: Testing not conducted. See Other Toxicity Data.

INHALATION LC50: Testing not conducted. See Other Toxicity Data.

OTHER TOXICITY DATA:
Specific toxicity tests have not been conducted on this product. Our hazard evaluation is based on information from similar products, the ingredients, technical literature, and/or professional experience.

No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program, the U.S. Occupational Safety and Health Act, or the International Agency on Research on Cancer (IARC).

SECTION 12 ECOLOGICAL INFORMATION

Ecological testing has not been conducted on this product by BP Amoco.

SECTION 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

SECTION 14 TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION: Not regulated.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: Not regulated.

LAND TRANSPORT ADR/RID: Not regulated.

AIR TRANSPORT IATA/ICAO: Not regulated.

MARITIME TRANSPORT IMDG: Not regulated.

SECTION 15 REGULATORY INFORMATION

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR Part 302.4): This product is not reportable under 40 CFR Part 302.4.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR Part 355): This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA TITLE III SECTION 311/312 HAZARDOUS CATEGORIZATION (40 CFR Part 370):
- ACUTE: N
- CHRONIC: N
- FIRE: N
- REACTIVE: N
- SUDDEN RELEASE: N

SARA TITLE III SECTION 313 (40 CFR Part 372): This product is not regulated under Section 313 of SARA and 40 CFR Part 372.

STATE REGULATIONS:
- California Proposition 65: N

TSCA INVENTORY STATUS: Listed on inventory.

OSHA HAZARD COMMUNICATION STANDARD: Contains a component listed by ACGIH. Contains a component listed by OSHA.

EC INVENTORY (EINECS/ELINCS): Not determined.

JAPAN INVENTORY (MITI): Not determined.

AUSTRALIA INVENTORY (AICS): Not determined.

KOREA INVENTORY (ECL): Not determined.

CANADA INVENTORY (DSL): Not determined.

PHILIPPINE INVENTORY (PICCS): Not determined.

CHINA INVENTORY (IECS): Not determined.

SECTION 16 OTHER INFORMATION

Prepared by: Product Stewardship and Toxicology

This Material Safety Data Sheet conforms to the requirements of ANSI Z400.1. NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

JET B FUEL

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                        M S D S                              *
*                                                             *
*  Canadian Centre for Occupational Health and Safety         *
* * * * * * * * * * * * Issue : 2001-1 (February, 2001)       *
```

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2483109
PRODUCT NAME(S) : TURBINE FUEL AVIATION, WIDE CUT TYPE
ESSO TURBO FUEL B
ESSO JET B
JET B
TURBO FUEL B
TURBO FUEL B F40
TURBO FUEL B JP4
ESSO TURBO FUEL B <FSII>
JET B <FSII>
AVIATION TURBINE FUEL <JP4>
CAN/CGSB-3.22 GRADE F40
ESSO JET B <FSII>
PRODUCT IDENTIFICATION : MSDS Number: 08524
DATE OF MSDS : 2000-06-15
CURRENCY NOTE : This MSDS was provided to CCOHS in electronic form on 2000-12-14

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Imperial Oil (Products Division)
ADDRESS : 111 St Clair Avenue West
Toronto Ontario
Canada M5W 1K3
Telephone: 416-968-4111

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : Imperial Oil (Products Division)
ADDRESS : 111 St Clair Avenue West
Toronto Ontario
Canada M5W 1K3
Telephone: 416-968-4111

*** MATERIAL SAFETY DATA ***

Date Prepared: June 15, 2000
Supersedes: April 21, 1999
MSDS Number: 08524

1. PRODUCT INFORMATION

Product Identifier: TURBINE FUEL AVIATION, WIDE CUT TYPE
ESSO TURBO FUEL B
ESSO JET B
JET B
TURBO FUEL B
TURBO FUEL B F40
TURBO FUEL B JP4
ESSO TURBO FUEL B <FSII>
JET B <FSII>
AVIATION TURBINE FUEL <JP4>
CAN/CGSB-3.22 GRADE F40
ESSO JET B <FSII>

Application and Use: Aviation turbine fuel

Product Description: A mixture of aliphatic and aromatic hydrocarbons and additives.

REGULATORY CLASSIFICATION

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

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT
All components of this product are either on the Domestic Substances List (DSL) or are exempt.

TDG INFORMATION (RAIL/ROAD):

Shipping Name: FUEL, AVIATION, TURBINE ENGINES
Class: 3
Packing Group: II
PIN Number: UN1863

Please be aware that other regulations may apply.

TELEPHONE NUMBERS

Emergency 24 hr. (519) 339-2145
Technical Info. (800) 268-3183

MANUFACTURER/SUPPLIER:

IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(416) 968-4441

2. REGULATED COMPONENTS

The following components are defined in accordance with sub-paragraph 13(a)(i) to (iv) or paragraph 14(a) of the Hazardous Products Act:

NAME	%	CAS #	
Kerosene, straight run	40-70 V/V	8008-20-6	LD50:>5g/kg,oral,rat
Naphtha, full range	30-60 V/V	64741-42-0	
Ethylene Glycol Monomethyl Ether	0-0.15 V/V	109-86-4	LD50:2.4g/kg,orl,rat LD50:0.8g/kg,orl,rab
Diethylene glycol monomethyl ether	0-0.15 V/V	111-77-3	LD50:9.2g/kg,orl,rat LD50:6.6g/kg,skn.rbt

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid
Specific gravity: not available
Viscosity: 0.60 cSt at 40 deg C
Vapour Density: 4
Boiling Point: 40 to 270 deg C
Evaporation rate: <1 (1= n-butylacetate)
Solubility in water: negligible
Freezing/Pour Point: -58 deg C ASTM D 2386
Odour Threshold: not available
Vapour Pressure: 21 kPa at 38 deg C
Density: 0.78 g/cc at 15 deg C
Appearance/odour: White or pale yellow liquid, petroleum odour

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

Negligible hazard at normal temperatures (up to 38 deg C).
High vapour concentrations are irritating to the eyes, nose, throat and lungs; may cause headaches and dizziness; may be anesthetic and may cause other central nervous system effects.
Avoid breathing vapours or mists.

EYE CONTACT:
Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:
Irritating.
Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).
Low toxicity.

INGESTION:
Low toxicity.
Small amounts of this liquid drawn into the lungs from swallowing or vomiting may cause severe health effects (e.g. bronchopneumonia or pulmonary edema).

CHRONIC:
May contain ethylene glycol monomethyl ether (EGME). Prolonged and/or repeated exposure through inhalation or extensive skin contact with EGME may result in toxic effects on the blood, the blood producing system, the kidneys, the male reproductive system and the embryo/fetus.
Contains benzene. Human health studies (epidemiology) indicate that prolonged and/or repeated overexposures to benzene may cause damage to the blood producing system and serious blood disorders, including leukemia.
Animal tests suggest that prolonged and/or repeated overexposures to benzene may damage the embryo/fetus. The relationship of these animal studies to humans has not been fully established.
Contains n-hexane. Prolonged and/or repeated exposures may cause damage to the peripheral nervous system (e.g. fingers, feet, arms etc.).
Contains diethylene glycol monomethyl ether (DIEGME). Prolonged and repeated exposure through inhalation or extensive skin contact with DIEGME may result in toxic effects on the kidneys, the reproductive system and/or the embryo/fetus.

ACUTE TOXICITY DATA:
Based on animal testing data from similar materials and products, the acute toxicity of this product is expected to be:

Oral	:	LD50 > 5000 mg/kg (Rat)
Dermal	:	LD50 > 2000 mg/kg (Rabbit)
Inhalation	:	LC50 > 2500 mg/m3 (Rat)

OCCUPATIONAL EXPOSURE LIMIT:
Manufacturer recommends:
100 ppm based on composition.
For Benzene (skin) 1 ppm TWA for 8 hour workday.

ACGIH recommends:
For n-Hexane (skin), 50 ppm (176 mg/m3).
For Benzene, ACGIH recommends a TWA of 0.5 ppm (1.6 mg/m3), (skin), and categorizes it as a confirmed human carcinogen.
For 2-Methoxyethanol, (skin) 5 ppm (16 mg/m3).

Local regulated limits may vary.

5. FIRST AID MEASURES

INHALATION:
In emergency situations use proper respiratory protection to immediately remove the affected victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:
Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:
Immediately flush with large amounts of water. Use soap if available. Remove contaminated clothing, including shoes, after flushing has begun. If irritation persists, seek medical attention.

INGESTION:
DO NOT induce vomiting since it is important that no amount of the material should enter the lungs (aspiration). Keep at rest. Get prompt medical attention.

6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:
The selection of personal protective equipment varies, depending upon conditions of use.
In open systems where contact is likely, wear safety goggles, chemical-resistant overalls, and chemically impervious gloves.
Where only incidental contact is likely, wear safety goggles, long sleeves, and chemical-resistant gloves.
Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:
The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.
Use explosion-proof ventilation equipment.

HANDLING, STORAGE AND SHIPPING:
Keep containers closed. Handle and open containers with care.
Store in a cool, well ventilated place away from incompatible materials.
In keeping with good personal hygiene practices, wash hands thoroughly after handling the material.

Store and load at normal (up to 38 deg C) temperature and at atmospheric pressure.

Material will accumulate static charges which may cause a spark. Static charge build-up could become an ignition source. Use proper relaxation and grounding procedures.
Empty containers may contain product residue. Do not pressurize cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

LAND SPILL:
Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard.
Vapours or dust may be harmful or fatal. Warn occupants of downwind areas.
Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust.
Recover by pumping (use an explosion proof motor or hand pump), or by using a suitable absorbent.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

WATER SPILL:
Eliminate all sources of ignition. Vapours or dust may be harmful or fatal. Warn occupants and shipping in downwind areas.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: -18 deg C COC ASTM D92

Autoignition: NA Flammable Limits: LEL: 0.6% UEL: 8.0%

GENERAL HAZARDS:
Extremely flammable; material will readily ignite at normal temperatures.
Flammable Liquid; may release vapours that form flammable mixtures at or above the flash point.
Decomposes; flammable/toxic gases will form at elevated temperatures (thermal decomposition).
Toxic gases will form upon combustion.
Static Discharge; material may accumulate static charges which may cause a fire.

FIRE FIGHTING:
Use water spray to cool fire exposed surfaces and to protect personnel.
Shut off fuel to fire if possible to do so without hazard. If a leak or spill has not ignited use water spray to disperse the vapours.
Either allow fire to burn out under controlled conditions or extinguish with foam or dry chemical. Try to cover liquid spills with foam.
Respiratory and eye protection required for fire fighting personnel.
Avoid spraying water directly into storage containers due to danger of boilover.
A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.

HAZARDOUS COMBUSTION PRODUCTS:
Smoke, carbon monoxide, carbon dioxide and traces of oxides of sulphur
In addition, small amounts of nitrogen oxides will be formed.

8. REACTIVITY DATA

STABILITY:
This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:
Strong oxidizing agents. Use product with caution around heat, sparks, pilo lights, static electricity and open flames.

HAZARDOUS DECOMPOSITION:
See: Hazardous Combustion Products

9. NOTES

All components of this product are listed on the U.S. TSCA inventory.

Boiling point change.

REVISION SUMMARY:
Since 21 April 1999, this MSDS has been revised in Section(s):
2, 3

10. PREPARATION

Date Prepared: June 15, 2000
Prepared by: Lubricants & Specialties
IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(800) 268-3183

LEAD ACID BATTERIES

M S D S

Canadian Centre for Occupational Health and Safety

Issue : 2001-1 (February, 2001)

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 624438
PRODUCT NAME(S) : Lead Acid type battery
PRODUCT IDENTIFICATION : T-MS-105
DATE OF MSDS : 1993-02-08

*** MANUFACTURER INFORMATION ***

MANUFACTURER : GNB Batteries (Canada) Inc
ADDRESS : 275 Lewis Street
Fort Erie Ontario
Canada L2A 5N6
Telephone: 905-871-5600
Fax: 905-871-6310

*** MATERIAL SAFETY DATA ***

T-MS-105 - EFFECTIVE February 8, 1993
REPLACING: March 15, 1992
TECHNICAL BULLETIN: Material Safety Data Sheet
SUBJECT TO CHANGE WITHOUT NOTICE

1. GENERAL INFORMATION

a) Product Name: Lead acid type battery
b) Product Type: (I) Wet Cells (Stationary, Motive Power and Railroad type batteries)
(II) Sealed modules
c) Application DC Power Source (Rechargeable)

2. BASIC COMPONENTS*
a) Lead alloy: Major component - Lead
Minor components -
Antimony or calcium and traces of arsenic (for wet cells)
Calcium, antimony and cadmium (for sealed modules)
b) Lead dioxide (active material)
c) Copper, stainless steel, brass etc. (used as hardware and other external components)
d) Sulfuric Acid (battery electrolyte)
e) Plastic materials like styrene-acrylonitrile copolymer, polypropylene or polycarbonate (battery container); synthetic rubber separators, glass mats, rubber washers etc. are also used.

* percentage of these components vary with the type of product.

3. PHYSICAL AND TOXICOLOGICAL DATA

a) Lead: Toxic, TLV 0.1 mg/M3, S.G. 11,34, m.p. 327 deg C.
b) Antimony: Toxic, TLV 0.5 mg/M3, S.G. 6.68, m.p. 630 deg C
c) Calcium: Nontoxic, m.p. 842 deg C, S.G. 1.54.
d) Cadmium: Toxic, TLV 0.2 mg/M3, S.G. 8.64, m.p 321 deg C.
Note: Physical and toxicological properties of a) to d) above vary with alloy composition.
e) Sulfuric acid: Corrosive, TLV 1.0 mg/M3, reacts with alkaline materials like caustic soda or soda ash; soluble in water. Battery electrolyte is 29-42 percent solution water, S.G. 1.215 - 1.300
f) Plastic Container Materials: Plastic materials used for battery containers are nontoxic solids. They are attacked by organic solvents and may be flammable if exposed to excessive heat or open flames.

(TLV = Threshold Limiting Value)
(SG = Specific Gravity)
(m.p. = melting point)

4. BY-PRODUCTS

Hydrogen and Oxygen Gasses	These gases generated at the end of charge of the battery could form explosive mixtures with air if proper ventilation is not provided. Explosive range for hydrogen in air is 4.1-74.2%.

5. PRECAUTIONS

a) Cells should not be exposed to excessive heat, open flames or freezing conditions. ABSOLYTE (R) type sealed modules however can withstand freezing conditions.
b) Cell jars are likely to be damaged on contact with organic solvents or detergents. Do not use such materials for the purpose of cleaning the cells.
c) Use protective gloves, acid resistant clothes and boots as well as safety glasses while working in the battery room.
d) Acid spills should be carefully neutralized by soda ash or baking soda. Neutralizing chemicals should not be allowed to enter the cells as they chemically react with the electrolyte.

6. HEALTH HAZARDS

a) Inhalation of sulfuric acid vapour can cause respiratory irritation. Use of mask and proper ventilation minimizes the possibility of inhalation of acid fumes. Do not operate the battery in closed space and in case of inhalation of acid fumes, remove the person to fresh air.
b) Splashing of electrolyte into the eyes or skin could cause irritation and severe burns. Affected area should be washed thoroughly with cold water.

Medical attention required in cases of eye exposure or severe skin exposure.
c) Lead, arsenic, antimony and cadmium also have toxic effects, but, emission of these materials from batteries is minimal.

7. FIRE AND EXPLOSION DATA

a) Plastic containers are flammable if exposed to extreme heat or open flame. Use carbon dioxide or dry chemicals only as fire extinguishers.
b) Gases generated at the end of charge could form explosive mixtures with air. Sources of sparks, flames etc. should be avoided. Smoking is not permitted in the battery room.

8. DISPOSAL AT END OF USE

Contact GNB at Fort Erie or the nearest sales office for procedure to be followed for the disposal of used batteries in accordance with Government regulations.

9. GENERAL REMARKS

Lead acid batteries as such pose no hazards to either health or the

environment. All toxic and corrosive components are contained within the cell jars and their emission is minimal. With proper maintenance and use, the battery will function as a DC power source for many years.

NOTE

DUE TO THE NEW MANUFACTURING TECHNOLOGY, GNB'S SEALED ABSOLYTE (R) MODULES REQUIRE CONSIDERABLE SMALLER QUANTITIES OF ELECTROLYTE. AS A CONSEQUENCE, POSSIBILITY OF SPILLAGE OR HYDROGEN EVOLUTION IS VERY MUCH REDUCED. THEY CAN BE STACKED IN ANY POSITION AND ARE ALSO AVAILABLE IN FLAME RESISTANT CONTAINERS. ALL OTHER PRECAUTIONS RECOMMENDED FOR WET CELLS ARE APPLICABLE TO SEALED ABSOLYTE (R) MODULES AS WELL.

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: SOLVENT-DEWAXED HEAVY PARAFFINIC DISTILLATE
CAS NUMBER: 64742-65-0
EC NUMBER (EINECS): 265-169-7
PERCENTAGE: <100

COMPONENT: HYDROTREATED HEAVY PARAFFINIC DISTILLATE
CAS NUMBER: 64742-54-7
EC NUMBER (EINECS): 265-157-1
PERCENTAGE: <100

(See Section 8, "Exposure Controls, Personal Protection", for exposure guidelines)

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=1 REACTIVITY=0

EMERGENCY OVERVIEW:
COLOR: yellow
PHYSICAL FORM: liquid
ODOR: hydrocarbon odor
MAJOR HEALTH HAZARDS: Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.

POTENTIAL HEALTH EFFECTS:
INHALATION:
No significant health hazards identified.
SKIN CONTACT:
Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis. Heated material can cause thermal burns.
EYE CONTACT:
No significant health hazards identified.
INGESTION:
Ingestion causes gastrointestinal irritation and diarrhea.

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Get medical attention.

SKIN CONTACT: Wash exposed skin with soap and water. Remove contaminated clothing and thoroughly clean and dry before reuse. Get medical attention if irritation develops.

EYE CONTACT: Flush eyes with plenty of water.

INGESTION: If swallowed, drink plenty of water. Get immediate medical attention. Induce vomiting only at the instructions of a physician. Do not give anything by mouth to unconscious or convulsive person.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Slight fire hazard.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical, regular foam, water

FIRE FIGHTING: Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Water or foam may cause frothing.

FIRE FIGHTING PROTECTIVE EQUIPMENT: Firefighters should wear full bunker gear, including a positive pressure self contained breathing apparatus.

FLASH POINT: 410 F (210 C)

FLAMMABILITY CLASSIFICATION: Not Flammable.

HAZARDOUS COMBUSTION PRODUCTS:
Thermal decomposition products or combustion: hydrocarbons, oxides of carbon

SECTION 6 ACCIDENTAL RELEASE MEASURES

Stop leak if possible without personal risk. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Cover with plastic sheet or tarp to minimize spreading and protect from contact with water. Prevent spreading by diking, ditching, or absorbing on inert materials.

SECTION 7 HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Do not store in unlabeled containers. Keep away from heat, sparks and flame. Store in a cool, dry place. Store in a well-ventilated area. Keep container tightly closed. Keep separated from incompatible substances.

HANDLING: Keep away from all ignition sources. Use only with adequate ventilation. Do not eat, drink or smoke in areas of use or storage. Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet facilities. Remove contaminated clothing and thoroughly clean and dry before reuse. Wash thoroughly after work using soap and water.
SPECIAL PRECAUTIONS: Empty containers may contain toxic,

flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
SOLVENT-DEWAXED HEAVY PARAFFINIC DISTILLATE:
MINERAL OIL MIST:
5 mg/m3 OSHA TWA
5 mg/m3 ACGIH TWA (Notice of Intended Changes 1993-1994)
10 mg/m3 ACGIH STEL (Notice of Intended Changes 1993-1994)
5 mg/m3 MEXICO TWA
10 mg/m3 MEXICO STEL

HYDROTREATED HEAVY PARAFFINIC DISTILLATE:
MINERAL OIL MIST:
5 mg/m3 OSHA TWA
5 mg/m3 ACGIH TWA (Notice of Intended Changes 1993-1994)
10 mg/m3 ACGIH STEL (Notice of Intended Changes 1993-1994)
5 mg/m3 MEXICO TWA
10 mg/m3 MEXICO STEL

VENTILATION: Use with adequate ventilation. Control airborne concentrations below the exposure guidelines.

EYE PROTECTION: None required; however, use of eye protection is good industrial practice.

CLOTHING: Avoid repeated or prolonged contact. Wear protective clothing if prolonged or repeated contact is likely.

GLOVES: Wear protective gloves if prolonged or repeated contact is likely.

RESPIRATOR: Use with adequate ventilation.
Avoid breathing vapor or mist.
If ventilation is inadequate, use a NIOSH certified respirator with an organic vapor cartridge and P95 particulate filter.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid
APPEARANCE: clear
COLOR: yellow
ODOR: hydrocarbon odor
BOILING POINT: 649 F (343 C)
FREEZING POINT: Not available
POUR POINT: 10.0 F (-12.2 C)
VAPOR PRESSURE: <0.1 mmHg @ 38 C
VAPOR DENSITY (air=1): >1

SPECIFIC GRAVITY (water=1): 0.873
WATER SOLUBILITY: almost insoluble
PH: Not available
VOLATILITY: negligible
ODOR THRESHOLD: Not available
EVAPORATION RATE: very slow, water=1
VISCOSITY: 150-160 SUS @ 38 C
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials.

INCOMPATIBILITIES: strong oxidizing materials

HAZARDOUS DECOMPOSITION:
Thermal decomposition products or combustion: hydrocarbons, oxides of carbon

POLYMERIZATION: Will not polymerize.

SECTION 11 TOXICOLOGICAL INFORMATION

EYE IRRITATION: Testing not conducted. See Other Toxicity Data.

SKIN IRRITATION: Testing not conducted. See Other Toxicity Data.

DERMAL LD50: Testing not conducted. See Other Toxicity Data.

ORAL LD50: Testing not conducted. See Other Toxicity Data.

INHALATION LC50: Testing not conducted. See Other Toxicity Data.

OTHER TOXICITY DATA:
Specific toxicity tests have not been conducted on this product. Our hazard evaluation is based on information from similar products, the ingredients, technical literature, and/or professional experience.

No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program, the U.S. Occupational Safety and Health Act, or the International Agency for Research on Cancer (IARC).

SECTION 12 ECOLOGICAL INFORMATION

Ecological testing has not been conducted on this product by BP Amoco.

SECTION 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

SECTION 14 TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION: Not regulated.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: Not regulated.

LAND TRANSPORT ADR/RID: Not regulated.

AIR TRANSPORT IATA/ICAO: Not regulated.

MARITIME TRANSPORT IMDG: Not regulated.

SECTION 15 REGULATORY INFORMATION

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR Part 302.4): This product is not reportable under 40 CFR Part 302.4.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR Part 355): This product is not regulated
under Section 302 of SARA and 40 CFR Part 355.

SARA TITLE III SECTION 311/312 HAZARDOUS CATEGORIZATION (40 CFR Part 370):
- ACUTE: N
- CHRONIC: N
- FIRE: N
- REACTIVE: N
- SUDDEN RELEASE: N

SARA TITLE III SECTION 313 (40 CFR Part 372): This product is not regulated under Section 313 of SARA and 40 CFR Part 372.

STATE REGULATIONS:
- California Proposition 65: N

TSCA INVENTORY STATUS: Listed on inventory.

OSHA HAZARD COMMUNICATION STANDARD: Contains a component listed by ACGIH.
Contains a component listed by OSHA.

EC INVENTORY (EINECS/ELINCS): In compliance.

JAPAN INVENTORY (MITI): Not determined.

AUSTRALIA INVENTORY (AICS): Not determined.

KOREA INVENTORY (ECL): Not determined.

CANADA INVENTORY (DSL): Listed on inventory.

PHILIPPINE INVENTORY (PICCS): Not determined.

CHINA INVENTORY (IECS): Not determined.

SECTION 16 OTHER INFORMATION

Prepared by: Product Stewardship and Toxicology

This Material Safety Data Sheet conforms to the requirements of ANSI Z400.1.
NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practice

MOTOR OIL

M S D S

Canadian Centre for Occupational Health and Safety

Issue : 2001-1 (February, 2001)

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2006368
PRODUCT NAME(S) : MOTOR OIL - ALL GRADES
PRODUCT IDENTIFICATION : MSDS NUMBER 3700A
DATE OF MSDS : 1998-06-10
CURRENCY NOTE : This MSDS was provided to CCOHS in electronic form on 1999-02-01

*** MANUFACTURER INFORMATION ***

MANUFACTURER : PRODUITS LUBRI-DELTA INC
ADDRESS : 2215 boulevard Industriel
Chomedey Laval Quebec
Canada H7S 1P8
Telephone: 450-629-4555 514-383-2784
Fax: 514-383-4241
EMERGENCY TELEPHONE NO. : 613-996-6666 (CANUTEC)

*** MATERIAL SAFETY DATA ***

PRODUITS LUBRI-DELTA INC.
2215, boulevard Industriel
Chomedey, Laval QC H7S 1P8

(450) 629-4555 (514) 383-2784 FAX (514) 383-4241

MATERIAL SAFETY DATA SHEET

PREPARATION INFORMATION

PERSON IN CHARGE	LAURENT MILLETTE
TELEPHONE NUMBER	(450) 629-4555
REVISED ON	June 10, 1998
MSDS NUMBER	3700A
MATERIAL IDENTIFICATION	MOTOR OIL - ALL GRADES
EMERGENCY CANADIAN CENTER	CANUTEC
	(613) 996-6666

THIS PRODUCT IS NOT REGULATED BY W.H.M.I.S.

DANGEROUS GOODS	**none**
TRANSPORT CLASSIFICATIONS	**none**

PHYSICAL DATA

APPEARANCE & ODOUR	liquid with characteristic odour
ODOUR LIMIT (ppm)	100
VAPOUR PRESSURE (mmHg 20 deg C)	>1
EVAPORATION RATE (butyl acetate = 1)	<1
pH	----------
DENSITY	0.86 to 0.92
VAPOUR DENSITY (air = 1)	>1
BOILING POINT deg C	170 to 350
FREEZING POINT deg C	-40 to 0
SOLUBILITY IN WATER/OIL	insoluble in water

FIRE & EXPLOSION DATA

INFLAMMABILITY CONDITIONS	none
EXTINGUISHING MEDIA	dry chemical products, foam, waterspray
FLASH POINT (open vase)	minimum 190 deg C
UPPER FLAMMABLE LIMIT %/VOLUME	not available
LOWER FLAMMABLE LIMIT %/VOLUME	not available
AUTO IGNITION TEMPERATURE	>220 deg C
DANGEROUS COMBUSTION PRODUCTS	thermal decomposition may produce carbon oxyde, nitrogen, phosphorous
SHOCK EXPLOSIBILITY	none
ELECTRO-STATICS	none

REACTIVITY

INSTABILITY CONDITIONS	stable
MATERIAL TO AVOID	all oxidizing and comburant products
CONDITIONS TO AVOID	high temperature
HAZARDOUS DECOMPOSITION PRODUCTS	carbon oxyde, nitrogen, phosphorous, sulfur

HEALTH HAZARD INFORMATION

SKIN CONTACT	prolonged or repeated contact can cause dermatitis
SKIN ABSORPTION	very low toxicity
EYE CONTACT	mild to severe irritation if not washed off rapidly
INHALATION	not considered as a risk at room temperature, low toxicity
ACUTE EXPOSITION EFFECTS	nothing serious
EXPOSITION LIMIT (ppm)	moderate, 8 hours (5 mg/m3)
IRRITATING PROPERTY	no
SENSIBILITY TO PRODUCT	none
CANCEROGENICITY	none
TOXIC EFFECTS ON REPRODUCTION	none
TERATOGENICITY	no
MUTAGENICITY	no
SYNERGETIC TOXICOLOGIC PRODUCTS	none

PREVENTIVE MEASURES

PERSONAL MATERIAL TO USE	rubber gloves
SPECIAL TECHNIQUES TO USE	none
STEPS TO BE TAKEN IF MATERIAL IS RECASED OR SPILLED	absorb with porus and chemically inert products
ELIMINATION OF RESIDUALS	according to local rules
METHODS AND EQUIPMENTS FOR MANUTENTION	normal uses and security measures to observe
SHIPPING INSTRUCTIONS	none

EMERGENCY AND FIRST-AID PROCEDURES

EYES	copious water flush - 15 minutes
SKIN	soap and water flush
INHALATION	not applicable
INGESTION	DO NOT INDUCE VOMITING, call a physician
EMERGENCY	QUEBEC ANTI-POISON CENTER AT 1-800-463-5060

The informations contained in this document are given as a guide for the product manutention and were written in good faith by competent technical personnel. These informations should not be considered as complete because other aspects of manutention and uses could be observed. In no case, Produits Lubri-Delta Inc. could be held responsible for damages, losts and injuries resulting of the use of this product and no warranty whatsoever, tacit or express is awarded by Produits Lubri-Delta Inc. This material safety data sheet is in effect for three (3) years.

OXYGEN

M S D S

Canadian Centre for Occupational Health and Safety

Issue : 2001-1 (February, 2001)

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 76352
PRODUCT NAME(S) : Oxygen
CURRENCY NOTE : MSDS Confirmed Current: 1999-02-24

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Airco Specialty Gases
ADDRESS : 575 Mountain Avenue
Murray Hill New Jersey
U.S.A. 07974
Telephone: 201-464-8100

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : Applied Research Products
ADDRESS : Post Office Box 277 Cartierville
Montreal Quebec
Canada H4K 2J6

*** MATERIAL SAFETY DATA ***

MATERIAL SAFETY DATA SHEET

Product Name: Oxygen
------ (Chemical name is underlined)

Synonyms: None

CAS Number: 7782-44-7

Chemical Formula: O2

Chemical Family: Oxidizer

DOT Hazard Class: Nonflammable gas

DOT Identification Number: UN 1072

Health Hazard Data

TWA: None established (ACGIH, 1984-85). Oxygen is the "vital element" in the atmosphere in which we live and breathe (approximately 21 molar % of the atmosphere.)

Symptoms of Exposure:
Breathing high concentrations (greater than 75 molar percent) causes symptoms of hyperoxia which include cramps, nausea, dizziness, hypothermia, amblyopia, respiratory difficulties, bradycardia, fainting spells and convulsions capable of leading to death. For additional information on hyperoxia, see Compressed Gas Association's Pamphlet P-14.

Toxicological Properties:
The property is that of hyperoxia which leads to pneumonia. Concentrations between 25 and 75 molar percent present a risk of inflammation of organic matter in the body.

Recommended First Aid Treatment:
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO OXYGEN. RESCUE PERSONNEL SHOULD BE COGNIZANT OF EXTREME FIRE HAZARD ASSOCIATED WITH OXYGEN-RICH ATMOSPHERES.

Conscious persons should be assisted to an uncontaminated area and breathe fresh air. They should be kept warm and quiet. The physician should be informed that the victim is experiencing (has experienced) hyperoxia.

Unconscious persons should be moved to and uncontaminated area and given assisted respiration. When breathing has been restored, treatment should be as above. Continued treatment should be symptomatic and supportive.

Hazardous Mixtures of Other Liquids, Solids, or Gases:
Oxygen vigorously accelerates combustion. Contact with all flammable materials should be avoided. Some materials which are not flammable in air will burn in pure oxygen or oxygen-enriched atmospheres.

Physical Data

Boiling Point: -297.3 deg F (-182.9 deg C)
Liquid Density @ Boiling Point: 71.23 lb/ft3 (1141 kg/m3)
Vapor Pressure @ 70 deg F (21.1 deg C): Above the critical temperatures of -181.1 deg F (118.4 deg C)
Specific Gravity @ 70 deg F, 1 atm (Air=1): 1.11
Solubility in Water: Slightly
Freezing Point: -361.8 deg F (-218.8 deg C)
Appearance and Odor: Colorless, odorless gas

Fire and Explosion Hazard Data

Flash Point (Method Used): N/A

Auto Ignition Temperature: N/A

LEL: N/A UEL: N/A

Extinguishing Media: Copious quantities of water for fires with oxygen as the oxidizer.

Electrical Classification: Nonhazardous

Special Fire Fighting Procedures: If possible, stop the flow of oxygen which is supporting the fire.

Unusual Fire and Explosion Hazards: Vigorously accelerates combustion.

Reactivity Data

Stable

Conditions to Avoid:

Incompatibility (Materials to Avoid): All flammable materials

Hazardous Decomposition Products: None

Hazardous Polymerization:
Will not occur

Conditions to Avoid:

Spill or Leak Procedures

Steps to Be Taken in Case Material is Released or Spilled:
Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact CHEMTREC for emergency assistance or your closest Airco location.

Waste Disposal Method:
Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to Airco for proper disposal.

Special Protection Information

Respiratory Protection: N/A

Ventilation: To prevent accumulation above 25 molar percent.

Local Exhaust: To prevent accumulation above 25 molar percent.

Special:

Mechanical (Gen.):

Other:

Protective Gloves: As required; any material

Eye Protection: Safety goggles or glasses

Other Protective Equipment: Safety shoes, safety shower

Special Precautions

Special Labeling Information:

DOT Shipping Name: Oxygen or Oxygen, compressed

DOT Hazard Class: Nonflammable gas

DOT Shipping Label: Oxidizer

I.D. No.: UN1072

Special Handling Recommendations:

Use only in well-ventilated areas. Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (< 3000 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

For additional handling recommendations, consult Compressed Gas Association's Pamphlets P-1, P-14 and G-4.

Special Storage Recommendations:

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits and away from full or empty stored cylinders which contain flammable products. Do not allow the temperature where cylinders are stored to exceed 130F (54C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time.

For additional storage recommendations, consult Compressed Gas Association's Pamphlets P-1, P-14 and G-4.

Special Packaging Recommendations:

Carbon steels and low alloy steels are acceptable for use at lower pressures. For high pressure applications use stainless steels, copper and its alloys, nickel and its alloys, brass, bronze, silicon alloys, Monel(R), Inconel(R) or beryllium. Lead and silver or lead and tin alloys are good gasketing materials. Teflon(R) and Kel-F(R) are the preferred nonmetal gaskets.

Special Note: It should be recognized that the ignition temperature of metals and nonmetals in pure oxygen service decreases with increasing oxygen pressure.

Other Recommendations or Precautions:

Oxygen should not be used as a substitute for compressed air in pneumatic equipment since this type generally contains flammable lubricants. Equipment to contain oxygen must be "cleaned for oxygen service". See Compressed Gas Association Pamphlet G-4.1. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of Federal Law (49CFR).

ISN: 76352

PROPANE

M S D S

Canadian Centre for Occupational Health and Safety

Issue : 2001-1 (February, 2001)

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 1434217
PRODUCT NAME(S) : H - D 5 PROPANE
DATE OF MSDS : 1997-02-18

*** MANUFACTURER INFORMATION ***

MANUFACTURER : IRVING OIL LIMITED
ADDRESS : Post Office Box 1421
Saint John New Brunswick
Canada E2L 4K1
Telephone: 506-632-2000
EMERGENCY TELEPHONE NO. : 506-648-3060

***

Message from Irving Oil Limited: The information contained in this form is based on data from sources considered to be reliable but Irving Oil Limited does not guarantee the accuracy or completeness thereof. The information is provided as a service to the persons purchasing or using the material to which it refers and Irving Oil Limited expressly disclaims all liability for loss or damage including consequential loss or for injury to persons including death. The information shall not be reproduced, published or distributed in any manner without the prior consent in writing of Irving Oil Limited.

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : IRVING OIL LIMITED
ADDRESS : Post Office Box 1421
Saint John New Brunswick
Canada E2L 4K1
Telephone: 506-632-2000
EMERGENCY TELEPHONE NO. : 506-648-3060

*** MATERIAL SAFETY DATA ***

PROPANE

MATERIAL SAFETY DATA SHEET

1. PRODUCT INFORMATION

PRODUCT IDENTIFIER		IRVING PRODUCT CODE
H - D 5 PROPANE		
WHMIS Classification	CLASS A - COMPRESSED GAS CLASS B, DIVISION 1: FLAMMABLE GAS	Application and Use AUTOMOTIVE OR SPACE HEATER FUEL

2. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State
Gas [X] Liquid [X] Solid [ ]

Odour and Appearance	COLOURLESS & ODORLESS WITHOUT MORCEPTON ADD
Odour Threshold (p.p.m.)	4800
Specific Gravity	.500 @ 15 deg C
Vapour Pressure (mm)	954 KPA @ 29.0 C
Vapour Density (Air = 1)	1.6
Evaporation Rate	RAPID
Boiling Point (deg C)	-40 C
Freezing Point (deg C)	-190 C
Solubility in Water (20 deg C)	6.1
% Volatile (by volume)	NOT AVAILABLE
pH	NOT AVAILABLE
Density (g/cm3)	.5
Coefficient of water/oil dist.	NOT AVAILABLE

3. HAZARDOUS INGREDIENTS OF MATERIAL

Hazardous Ingredients	Approximate Concentration %	C.A.S. N.A. or U.N. Numbers
PROPANE	95-98%	74-98-6
LD50 Specify Species and Route: NOT AVAILABLE		
LC50 Specify Species and Route: NOT AVAILABLE		
ETHANE	3-5%	74-84-0
LD50 Specify Species and Route: NOT AVAILABLE		
LC50 Specify Species and Route: NOT AVAILABLE		
BUTANE	1-3%	79-10-68
LD50 Specify Species and Route: NOT AVAILABLE		
LC50 Specify Species and Route: NOT AVAILABLE		
ISO-BUTANE	0.1-0.3%	75-28-5
LD50 Specify Species and Route: NOT AVAILABLE		
LC50 Specify Species and Route: NOT AVAILABLE		

PROPANE

METHANE 0.1-0.2% 74-82-8
LD50 Specify Species and Route: NOT AVAILABLE
LC50 Specify Species and Route: NOT AVAILABLE

4. HEALTH HAZARD INFORMATION

ROUTE OF ENTRY
SKIN CONTACT [X] SKIN ABSORPTION [ ] EYE CONTACT [X]
INHALATION [X] INGESTION [ ]

EFFECTS OF ACUTE EXPOSURE TO PRODUCT
HIGH CONCENTRATIONS CAN CAUSE OXYGEN DEFICIENCY BY DISPLACING AIR AND CAUSE RAPID BREATHING, FATIGUE, INCOORDINATION, EXCESSIVE SALIVATION, HEADACHE, NAUSEA, VOMITING AND DISORIENTATION.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT
IF NOT REMOVED MAY CAUSE CONVULSIONS LOSS OF CONSCIOUSNESS AND DEATH. 10 MINUTES TO 10,000 PPM HAS PRODUCED DROWSINESS.

REPRODUCTIVE TOXICITY
NOT AVAILABLE

EXPOSURE LIMITS
1000 PPM FOR DAILY 8 HR EXPOSURE

IRRITANCY OF PRODUCT
MINOR SKIN AND EYE (GAS) (LIQUID) - EYE INJURY, FROST BITE, RESPIRATORY PROBLEMS

SENSITIZATION TO PRODUCT
NOT AVAILABLE

CARCINOGENICITY
NOT AVAILABLE

TERATOGENICITY
NOT AVAILABLE

MUTAGENICITY
NOT AVAILABLE

SYNERGISTIC PRODUCTS
NOT AVAILABLE

5. FIRE AND EXPLOSION HAZARD

FLAMMABILITY	IF YES, UNDER	LIQUID EVAPORATES AND FORMS FUMES,
YES [X] NO [ ]	WHICH CONDITIONS?	WHICH CAN EXPLODE OR BURN QUICKLY IF IGNITED.

MEANS OF EXTINCTION which conditions
STOPFLOW - CO2 OR DRY CHEMICAL WATER FOG PRODUCED BY SPECIAL NOZZLE IS EFFECTIVE BUT REQUIRES EXPERIENCE.

SPECIAL PROCEDURES
DO NOT ENTER ANY ENCLOSED OR CONFINED SPACE WITHOUT PROPER PROTECTIVE EQUIPMENT INCLUDE SELF - CONTAINED BREATHING APPARATUS.

FLASHPOINT (DEG C) AND METHOD
-140 deg C

PROPANE

UPPER FLAMMABLE LIMIT (% BY VOLUME)
9.5%
LOWER FLAMMABLE LIMIT (% BY VOLUME)
2.4%
AUTO IGNITION TEMPERATURE (DEG C)
432 deg C
TDG FLAMMABILITY CLASSIFICATION
UN 1978 / 2.1
HAZARDOUS COMBUSTION PRODUCTS
SMOKE, CARBON MONOXIDE, CARBON DIOXIDE
EXPLOSION DATA SENSITIVITY TO IMPACT SENSITIVITY TO STATIC DISCHARGE

6. FIRST AID MEASURES

INHALATION
REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED. CALL DOCTOR.
INGESTION
NOT EXPECTED TO BE AN INGESTION PROBLEM.
EYE
IF THE LIQUID SPLASHED IN EYES FLUSH IMMEDIATELY WITH FRESH WATER FOR AT LEAST 15 MINUTES. CALL A DOCTOR.
SKIN
SOAK THE AFFECTED AREA IN LUKEWARM WATER. SEE DOCTOR FOR FROSTBITE OR BURNS.
GENERAL ADVICE

7. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT
PROTECT FROM SKIN CONTACT
GLOVES (SPECIFY)
IMPERVIOUS PROTECTIVE GLOVES
RESPIRATORY (SPECIFY)
CARTRIDGE RESPIRATOR-OR-AIR SUPPLIED
EYE (SPECIFY)
CHEMICAL SAFETY GLASSES
FOOTWEAR (SPECIFY)

CLOTHING (SPECIFY)
IMPERVIOUS PROTECTIVE CLOTHING
OTHER (SPECIFY)

ENGINEERING CONTROLS (SPECIFY, E.G. VENTILATION, ENCLOSED PROCESS)

LEAK AND SPILL PROCEDURE
EVACUATE AREA - ELIMINATE ALL SOURCES OF IGNITION - WEAR PROTECTIVE CLOTHING

FOR CLEANUP.

WASTE DISPOSAL

NOT AVAILABLE

HANDLING PROCEDURES AND EQUIPMENT

HANDLE AND OPEN CONTAINERS WITH CARE.

STORAGE REQUIREMENTS

STORE IN COOL WELL VENTILATED AREA. KEEP AWAY FROM STRONG OXIDIZING MATERIAL AND SOURCES OF IGNITION.

SPECIAL SHIPPING INFORMATION

STORE AND LOAD AT NORMAL TEMPERATURE (UP TO 38 C) AND AT ATMOSPHERIC PRESSURE

8. REACTIVITY DATA

CHEMICAL STABILITY YES [X] NO [ ] IF NO, UNDER WHICH CONDITIONS?

INCOMPATIBILITY WITH OTHER SUBSTANCES

YES [X] NO [ ] IF SO, WHICH ONES? MAY REACT WITH STRONG OXIDIZING MATERIALS

REACTIVITY, AND UNDER WHAT CONDITIONS

HAZARDOUS DECOMPOSITION PRODUCTS

NORMAL COMBUSTION FORMS CARBON DIOXIDE AND WATER VAPOR. INCOMPLETE COMBUSTION CAN PRODUCE CARBON MONOXIDE.

9. PREPARATION

PREPARED BY: IRVING OIL LIMITED,
SAINT JOHN, N.B.
(506) 632-2000

DATE: FEB. 18, 1997

Cette fiche signaletique est aussi disponible en francais

VARSOL

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                        M S D S                          *
*                                                         *
*  Canadian Centre for Occupational Health and Safety     *
* * * * * * * * * * * * Issue : 2001-1 (February, 2001) *
```

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2429254
PRODUCT NAME(S) : VARSOL DX 3641
DATE OF MSDS : 1999-07-20
CURRENCY NOTE : This MSDS was provided to CCOHS in electronic form on 2000-09-27

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : CANADA COLORS AND CHEMICALS LIMITED
ADDRESS : 80 Scarsdale Road
Don Mills Ontario
Canada M3B 2R7
Telephone: 416-449-7750
EMERGENCY TELEPHONE NO. : 416-444-2112
SUPPLIER/DISTRIBUTOR NOTE :
For further information about this product please contact the Canada Colors Customer Service Department at 416-449-7750.

MATERIAL SAFETY DATA SHEET : 00004966

CANADA COLORS AND CHEMICALS LI
80 SCARSDALE ROAD
DON MILLS, ONTARIO M3B 2R7
(416) 449-7750

Product: VARSOL DX 3641

SECTION 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER..... VAN WATERS & ROGERS LTD.
9800 VAN HORNE WAY
RICHMOND, B.C.
CANADA
V6X 1W5

PRODUCT NAME:.....
PRODUCT CODE:.....
CHEMICAL FORMULA..... N.AV.
MOLECULAR WEIGHT..... N.AV.
CHEMICAL FAMILY..... N.AV.
MATERIAL USE..... REFER TO TECHNICAL LITERATURE.

EMERGENCY PHONE NO..... (416)-444-2112.

SECTION 02: COMPOSITION/INFORMATION ON INGREDIENTS

%	CAS / TLV	LD/50, ROUTE, SPECIES	LC/50, ROUTE, SPECIES
NAPHTHA, HYDROTREATED LIGHT			
100	64742-47-8	5000 MG/KG (ORL-RAT)	N.AV.
	---	3000 MG/KG (DERMAL-RABBIT)	

SECTION 03: HAZARDS IDENTIFICATION

ROUTE OF ENTRY:.....
- SKIN CONTACT..... IRRITANT.
- SKIN ABSORPTION..... N.AV.
- EYE CONTACT..... IRRITANT.
- INHALATION..... HARMFUL IF INHALED.
- INGESTION..... HARMFUL IF SWALLOWED.

EFFECTS OF ACUTE EXPOSURE..... SEE ABOVE.
EFFECTS OF CHRONIC EXPOSURE..... NONE KNOWN.

SECTION 04: FIRST AID MEASURES

INSTRUCTIONS:..... IN CASE OF INHALATION, REMOVE TO FRESH AIR.GET IMMEDIATE MEDICAL ATTENTION.FLUSH EYES WITH LARGE AMOUNTS OF RUNNING WATER FOR AT LEAST 15 MINUTES. HOLD EYELIDS APART TO ENSURE RINSING OF THE ENTIRE SURFACE OF THE EYE AND LIDS WITH WATER.IN CASE OF SKIN CONTACT.WASH SKIN WITH LARGE AMOUNTS OF RUNNING WATER, AND SOAP IF AVAILABLE, FOR 15 MINUTES.IF IRRITATION PERSISTS, GET MEDICAL ATTENTION.WASH CLOTHING BEFORE REUSE.IN CASE OF INGESTION:. DO NOT INDUCE VOMITING.GET IMMEDIATE MEDICAL ATTENTION.DO NOT GIVE ANYTHING BY MOUTH TO A CONVULSING OR UNCONSCIOUS PERSON.

SECTION 05: FIRE FIGHTING MEASURES

T.D.G. FLAM. CLASS	NOT REGULATED.
FLAMMABILITY	SEE FLASH POINT.
IF YES, UNDER WHICH CONDITIONS?	
EXTINGUISHING MEDIA	CARBON DIOXIDE, DRY CHEMICAL, ALCOHOL FOAM, WATER FOG. WATER SPRAY.
SPECIAL PROCEDURES	DO NOT USE A JET OF WATER OR FOAM.WEAR FULL PROTECTIVE EQUIPMENT INCLUDING A SELF-CONTAINED BREATHING APPARATUS.USE WATER-SPRAY TO KEEP CONTAINERS COOL.
FLASH POINT (C), METHOD	63.
AUTO IGNITION TEMPERATURE	N.AV.
UPPER FLAMMABLE LIMIT (% BY VOL.)	13 %.
LOWER FLAMMABLE LIMIT (% BY VOL.)	2.1.
EXPLOSION DATA	
EXPLOSIVE POWER	N.AV.
RATE OF BURNING	N.AV.
SENSITIVITY TO STATIC	N.AV.
DISCHARGE SENSITIVITY TO IMPACT	N.AV.
UNUSUAL FIRE AND EXPLOSION HAZARDS	NONE KNOWN.
HAZARDOUS COMBUSTION PRODUCTS	N.AV.

SECTION 06: ACCIDENTAL RELEASE MEASURES

LEAK/SPILL	COMBUSTIBLE LIQUID.KEEP AWAY FROM HEAT OR FLAME. ABSORB WITH AN INERT MATERIAL SUCH AS SAND, SOIL OR VERMICULITE; SWEEP UP AND DISPOSE OF IN ACCORDANCE TO ALL GOVERNMENT REGULATIONS. ELIMINATE IGNITION SOURCES.SCOOP UP USED ABSORBENT INTO DRUMS.PREVENT RUNOFF INTO DRAINS, SEWERS, AND OTHER WATERWAYS.REPORT AS PER REGULATORY REQUIREMENTS.

SECTION 07: HANDLING AND STORAGE

HANDLING PROCEDURES AND EQUIPMENT	KEEP CONTAINERS CLOSED WHEN NOT IN USE.AVOID CONTACT WITH EYES, SKIN, AND CLOTHING.WASH THOROUGHLY AFTER HANDLING.
STORAGE NEEDS	STORE IN A COOL, DRY, WELL VENTILATED AREA, AWAY FROM HEAT AND IGNITION SOURCES.STORE AWAY FROM INCOMPATIBLE MATERIALS.KEEP THE CONTAINER TIGHTLY

CLOSED WHEN NOT IN USE.

SECTION 08: EXPOSURE CONTROLS/PERSONAL PROTECTION

GLOVES/ TYPE	WEAR IMPERVIOUS GLOVES.
RESPIRATORY/TYPE	ATMOSPHERIC LEVELS SHOULD BE MAINTAINED BELOW THE EXPOSURE GUIDELINE. WHEN RESPIRATORY PROTECTION IS REQUIRED FOR CERTAIN OPERATIONS, USE AN NIOSH APPROVED AIR-PURIFYING RESPIRATOR.
EYE/TYPE	CHEMICAL SAFETY GOGGLES.
FOOTWEAR/TYPE	SAFETY SHOES.
CLOTHING/TYPE	FULL COVER CLOTHING.
OTHER/TYPE	EYE BATH AND SAFETY SHOWER.
ENGINEERING CONTROLS	GENERAL (MECHANICAL) ROOM VENTILATION IS EXPECTED TO BE SATISFACTORY.

SECTION 09: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	CLEAR. LIQUID.
ODOUR	MILD ODOUR.
ODOUR THRESHOLD	200 PPM.
VAPOUR PRESSURE (MMHG)	0.75.
VAPOUR DENSITY (AIR=1)	5.4.
EVAPORATION RATE	0.1.
BOILING POINT	186 (C).
PH	N.AV.
SPECIFIC GRAVITY (WATER=1)	0.79 (20(C)).
SOLUBILITY IN WATER (% W/W)	INSOLUBLE.
COEFFICIENT OF WATER/OIL DIST	N.AV.

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY:	
YES	YES.
NO, WHICH CONDITIONS?	
COMPATABILITY WITH OTHER SUBSTANCES:	
YES	
NO, WHICH ONES?	OXIDIZING AGENTS.
REACTIVITY CONDITIONS?	AVOID EXCESSIVE HEAT, OPEN FLAMES AND ALL IGNITION SOURCES.
HAZARDOUS PRODUCTS OF DECOMPOSITION	NONE KNOWN.
HAZARDOUS POLYMERIZATION	WILL NOT OCCUR.

SECTION 11: TOXICOLOGICAL INFORMATION

EXPOSURE LIMIT OF MATERIAL	NOT ESTABLISHED.
LC 50 OF MATERIAL, SPECIES & ROUTE	NONE FOUND.
LD 50 OF MATERIAL, SPECIES & ROUTE	N.AV.
CARCINOGENICITY OF MATERIAL	N.AV.
REPRODUCTIVE EFFECTS	N.AV.
IRRITANCY OF MATERIAL	SEE SECTION 03.
SENSITIZING CAPABILITY OF MATERIAL	N.AV.
SYNERGISTIC MATERIALS	N.AV.

SECTION 12: ECOLOGICAL CONSIDERATIONS

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL	IN ACCORDANCE WITH MUNICIPAL, PROVINCIAL AND FEDERAL REGULATIONS.

SECTION 14: TRANSPORT INFORMATION

UN NUMBER	N.AP.
TDG CLASSIFICATION	NOT REGULATED.
PACKING GROUP	N.AP.
SPECIAL SHIPPING INSTRUCTIONS	N.AP.

SECTION 15: REGULATORY INFORMATION

WHMIS CLASSIFICATION	B3. D2B.
CPR COMPLIANCE	THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CPR AND THE MSDS CONTAINS ALL THE INFORMATION REQUIRED BY THE CPR.

SECTION 16: OTHER INFORMATION

N.AV.=NOT AVAILABLE.....
N.AP.=NOT APPLICABLE.....
PREPARED BY..... Regulatory Affairs
DATED..... 07201999

WINSHIELD WASHER FLUID

M S D S

Canadian Centre for Occupational Health and Safety

Issue : 2001-1 (February, 2001)

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2487897
PRODUCT NAME(S) : WINDSHIELD WASHER FLUID
PRODUCT IDENTIFICATION : PRODUCT CODE R00072260000
DATE OF MSDS : 1999-06-29
CURRENCY NOTE : This MSDS was provided to CCOHS in electronic form on 2000-12-18

*** MANUFACTURER INFORMATION ***

MANUFACTURER : SUN COMPANY, INC
ADDRESS : Ten Penn Center
1801 Market Street
Philadelphia Pennsylvania
U.S.A. 19103-1699
Telephone: 215-977-6182 (Joanne Houck)
EMERGENCY TELEPHONE NO. : 800-964-8861 (SUN COMPANY, AFTER NORMAL BUSINESS HOURS)
800-424-9300 (CHEMTREC, AFTER NORMAL BUSINESS HOURS)

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

REVISION DATE: 06/29/1999
UN NUMBER- UN1993

PRIMARY APPLICATION- WINDSHIELD WASHER FLUID

MANUFACTURER- SUN COMPANY, INC.
TEN PENN CENTER
1801 MARKET STREET
PHILADELPHIA PA 19103-1699

SYNONYMS..... : WINDSHIELD WASHER PREMIX
CAS REGISTRY NO: SEE SEC. 2
CAS NAME..... : NO CLASSIFICATION - MIXTURE
CHEMICAL FAMILY: BLEND
INFORMATION
SUPPLIER.. JOANNE HOUCK
PHONE.... : (610) 859-1120

EMERGENCY PHONE NUMBERS (AFTER NORMAL BUSINESS HOURS)
SUN CO.. 1-800-964-8861

CHEMTREC. 1-800-424-9300

2. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT/CAS NO.	LO%	HI%	EXPOSURE GUIDELINES OSHA TWA	OSHA STEL	ACGIH TWA	ACGIH STEL	SUN/MFR TWA	SUN/MFR STEL	UNIT
LIMITS FOR THE PRODUCT:					NO SPECIFIC LIMIT				
METHANOL 67-56-1	35.00	45.00	200	250	200	250			PPM
WATER 7732-18-5	55.00	65.00			NO SPECIFIC LIMIT				
C.I. ACID BLUE 9 3844-45-9	.00	1.00			NO SPECIFIC LIMIT				

ADDITIONAL EXPOSURE LIMITS ---------- GOVERNMENT REGULATION
OTHER LIMIT- SEE SECTION 2

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW ----------

DANGER] FLAMMABLE LIQUID AND VAPOR. HARMFUL IF INHALED. HIGH VAPOR CONCENTRATIONS MAY CAUSE DIZZINESS. MAY CAUSE SKIN IRRITATION. CAUSES EYE IRRITATION. POISON] MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED. MAY CAUSE SEVERE CHRONIC TOXICITY.

APPEARANCE-- CLEAR BLUE LIQUID ODOR-- MILD ALCOHOL ODOR

POTENTIAL HEALTH EFFECTS ----------

PRIMARY ROUTES OF ENTRY- INHALATION(X) SKIN(X) EYE(X) INGESTION(X)

INHALATION ----------
EXCESSIVE EXPOSURES MAY CAUSE IRRITATION TO EYES, NOSE, THROAT, LUNGS; RESPIRATORY TRACT; CENTRAL NERVOUS SYSTEM (BRAIN) EFFECTS; HEADACHES, NAUSEA; DIZZINESS, LOSS OF BALANCE AND COORDINATION; UNCONSCIOUSNESS, COMA; RESPIRATORY FAILURE AND DEATH. REPEATED EXCESSIVE EXPOSURES MAY CAUSE LIVER EFFECTS OR DAMAGE. KIDNEY EFFECTS OR DAMAGE.

SKIN ----------
SKIN ABSORPTION OF MATERIAL MAY PRODUCE SYSTEMIC TOXICITY. MAY CAUSE MODERATE IRRITATION WITH PROLONGED OR REPEATED CONTACT. REMOVES NATURAL OILS & FATS FROM SKIN.

EYE ----------
CONTACT WITH THE EYE MAY CAUSE MODERATE IRRITATION. CORNEAL DAMAGE OR OPACITY.

INGESTION ----------
HARMFUL OR FATAL IF SWALLOWED. CANNOT BE MADE NON-POISONOUS. INGESTION OF THIS MATERIAL MAY CAUSE BLINDNESS; CENTRAL NERVOUS SYSTEM (BRAIN)

EFFECTS; NAUSEA, VOMITING AND DIARRHEA; INGESTION OF THIS MATERIAL MAY CAUSE DAMAGE TO CENTRAL NERVOUS SYSTEM (BRAIN); VISION; LIVER; KIDNEYS;

CARCINOGEN LISTED BY-IARC(NO) NTP(NO) OSHA(NO) ACGIH(NO) OTHER(NO)

PRE-EXISTING MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE-
DISORDERS OR DISEASES OF THE SKIN, EYE, LIVER, KIDNEY, RESPIRATORY, PULMONARY AND LUNG (E.G. ASTHMA-LIKE CONDITIONS).

4. FIRST AID MEASURES

INHALATION ----------
MOVE PERSON TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, OBTAIN MEDICAL ASSISTANCE.

SKIN ----------
WASH WITH SOAP AND WATER UNTIL NO ODOR REMAINS. IF REDNESS OR SWELLING DEVELOPS, OBTAIN MEDICAL ASSISTANCE. IMMEDIATELY REMOVE SOAKED CLOTHING. WASH CLOTHING BEFORE REUSE. DESTROY CONTAMINATED SHOES.

EYE ----------
FLUSH WITH WATER FOR AT LEAST 15 MINUTES. OBTAIN MEDICAL ASSISTANCE.

INGESTION ----------
GIVE LIQUIDS AND INDUCE VOMITING UNLESS VICTIM IS UNCONSCIOUS. IF INDIVIDUAL IS CONSCIOUS, GIVE MILK OR WATER TO DILUTE. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF VICTIM IS CONSCIOUS AND ALERT VOMITING SHOULD BE INDUCED BY OR UNDER THE DIRECTION OF A PHYSICIAN OR POISON CONTROL CENTER. OBTAIN EMERGENCY MEDICAL ATTENTION.

5. FIRE FIGHTING MEASURES

FLASH POINT: 98 (DEG. F); 36 (DEG. C)
AUTOIGNITION TEMP.: NOT DETERMINED (DEG. F); NOT DETERMINED (DEG. C)

---FLAMMABLE LIMITS IN AIR---
LOWER EXPLOSIVE LIMIT (LEL): NOT DETERMINED % VOLUME
UPPER EXPLOSIVE LIMIT (UEL): NOT DETERMINED % VOLUME

FIRE AND EXPLOSION HAZARDS ----------
FLAMMABLE LIQUID (FLASH POINT LESS THAN 100F)

EXTINGUISHING-MEDIA ----------
WATER SPRAY. ALCOHOL RESISTANT FOAM. DRY CHEMICAL. CARBON DIOXIDE.

SPECIAL FIRE FIGHTING INSTRUCTIONS ---------
USE WATER SPRAY. COOL TANK/ CONTAINER. WEAR SELF-CONTAINED BREATHING APPARATUS. WEAR STRUCTURAL FIREFIGHTERS PROTECTIVE CLOTHING.

NFPA/HMIS CLASSIFICATION HAZARD RATING

HEALTH - 1 / 1
FIRE - 2 / 2
REACTIVITY - 0 / 0
PERSONAL PROTECTION INDEX - X

0=LEAST 1=SLIGHT
2=MODERATE 3=HIGH
4=EXTREME

SPECIFIC HAZARD: FLAMMABLE

6. ACCIDENTAL RELEASE MEASURES

PREVENT IGNITION; STOP LEAK; VENTILATE AREA. CONTAIN SPILL. USE WATER SPRAY TO DISPERSE VAPORS. KEEP UPWIND OF LEAK. USE PERSONAL PROTECTIVE EQUIPMENT STATED IN SECTION 8. ADVISE EPA; STATE AGENCY IF REQUIRED. ABSORB ON INERT MATERIAL. SHOVEL, SWEEP OR VACUUM SPILL.

7. HANDLING AND STORAGE

KEEP AWAY FROM HEAT, SPARKS AND FLAME. KEEP IN COOL, DRY PLACE. KEEP CONTAINER TIGHTLY CLOSED. KEEP IN WELL VENTILATED SPACE. STORAGE HAS TEMPERATURE LIMITS--SEE STABILITY. NFPA CLASS 1C STORAGE. CONSULT NFPA AND OSHA CODES. TRANSFER OPERATIONS MUST BE ELECTRICALLY GROUNDED TO DISSIPATE STATIC BUILDUP. AVOID PROLONGED BREATHING OF MIST OR VAPOR. AVOID CONTACT WITH THIS MATERIAL. AVOID CONTACT WITH EYES. WASH THOROUGHLY AFTER HANDLING. NEVER SIPHON BY MOUTH.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

CONSULT WITH A HEALTH/SAFETY PROFESSIONAL FOR SPECIFIC SELECTION.

VENTILATION ----------
USE ONLY WITH ADEQUATE VENTILATION. VENTILATE AS NEEDED TO COMPLY WITH EXPOSURE LIMIT. EXPLOSION PROOF VENTILATION EQUIPMENT REQUIRED.

PERSONAL PROTECTIVE EQUIPMENT ----------
EYE ----------
SPLASH PROOF CHEMICAL GOGGLES OR FULL FACE SHIELD RECOMMENDED TO PROTECT AGAINST SPLASH OF PRODUCT.

GLOVES ----------
PROTECTIVE GLOVES RECOMMENDED WHEN PROLONGED SKIN CONTACT CANNOT BE AVOIDED. THE FOLLOWING GLOVE MATERIALS ARE ACCEPTABLE: POLYETHYLENE; NEOPRENE; NITRILE; POLYVINYL ALCOHOL; VITON; NATURAL RUBBER;

RESPIRATOR ----------
CONCENTRATION-IN-AIR DETERMINES PROTECTION NEEDED. USE ONLY NIOSH CERTIFIED RESPIRATORY PROTECTION. HALF-MASK AIR PURIFYING RESPIRATOR

WITH ORGANIC VAPOR CARTRIDGES IS ACCEPTABLE TO 10 TIMES THE EXPOSURE LIMIT. FULL-FACE AIR PURIFYING RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES IS ACCEPTABLE TO 50 TIMES THE EXPOSURE LIMIT NOT TO EXCEED THE CARTRIDGE LIMIT OF 1000 PPM. PROTECTION BY AIR PURIFYING RESPIRATORS IS LIMITED. USE A POSITIVE PRESSURE-DEMAND FULL-FACE SUPPLIED AIR RESPIRATOR OR SCBA FOR EXPOSURES ABOVE 50X THE EXPOSURE LIMIT. IF EXPOSURE IS ABOVE IDLH(IMMEDIATELY DANGEROUS TO LIFE & HEALTH) OR THERE IS THE POSSIBILITY OF AN UNCONTROLLED RELEASE OR EXPOSURE LEVELS ARE UNKNOWN THEN USE A POSITIVE PRESSURE-DEMAND FULL-FACE SUPPLIED AIR RESPIRATOR WITH ESCAPE BOTTLE OR SCBA.

OTHER ----------

IF CONTACT IS UNAVOIDABLE, WEAR CHEMICAL RESISTANT CLOTHING. THE FOLLOWING MATERIALS ARE ACCEPTABLE AS PROTECTIVE CLOTHING MATERIALS: POLYETHYLENE; POLYVINYL ALCOHOL(PVA); NEOPRENE; NITRILE; VITON; SAFETY SHOWER AND EYE WASH AVAILABILITY RECOMMENDED. LAUNDER SOILED CLOTHES. FOR NON-FIRE EMERGENCIES, POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS (SCBA) & STRUCTURAL FIREFIGHTERS' PROTECTIVE CLOTHING WILL PROVIDE LIMITED PROTECTION.

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT..... : 148 (DEG. F) _____ 64 (DEG. C)
MELTING POINT..... : N.D. (DEG. F) _____ N.D. (DEG. C)
SPECIFIC GRAVITY... : 0.97 (WATER=1)
PACKING DENSITY.... : N/A (KG/M3)
VAPOR PRESSURE..... : 97.68 (MM HG @ 20 DEG C)
VAPOR DENSITY...... : N/A (AIR=1)
SOLUBILITY IN WATER.: 100% (% BY VOLUME)
PH INFORMATION..... : N.D. AT CONC. N.D. G/L H2O
% VOLATILES BY VOL..: N/A
EVAPORATION RATE... : N/A (ETHYL ETHER=1)
OCTANOL/WATER COEFF.: N.D.
APPEARANCE..... : CLEAR BLUE LIQUID
ODOR..... : MILD ALCOHOL ODOR
ODOR THRESHOLD..... : N.D. (PPM)
VISCOSITY..... : N.D. SUS @ N.D DEG F ... N.D. CST @ N.D DEG C
MOLECULAR WEIGHT... : N.D. (G/MOLE)

10. STABILITY AND REACTIVITY

STABILITY ----------

STABLE

CONDITIONS TO AVOID-

HEAT, SPARKS AND OPEN FLAMES. STORE AT TEMPERATURES BELOW 120 DEG F.

INCOMPATIBLE MATERIALS ----------

STRONG OXIDIZERS

HAZARDOUS DECOMPOSITION --------------------
COMBUSTION WILL PRODUCE CARBON MONOXIDE AND ASPHYXIANTS
POLYMERIZATION -----------------------------
WILL NOT OCCUR.

11. TOXICOLOGICAL INFORMATION

FOR THE PRODUCT ------------
INHALATION/ORAL: POISON] CANNOT BE MADE NON-POISONOUS. HARMFUL/FATAL IF INHALED OR SWALLOWED. EFFECTS MAY BE DELAYED. OVEREXPOSURE MAY CAUSE EYE & RESPIRATORY IRRITATION, HEADACHE, NAUSEA, VOMITING, VISUAL IMPAIRMENT, CONFUSION, RESPIRATORY FAILURE, COMA & DEATH. IF SWALLOWED CAN CAUSE BLINDNESS, SEVERE GASTROINTESTINAL TRACT IRRITATION, CNS (BRAIN) EFFECTS. MASSIVE OVERDOSE MAY CAUSE HEART, LIVER, KIDNEY, BRAIN EFFECTS/DAMAGE. SKIN: CAN BE ABSORBED. PROLONGED OR REPEATED CONTACT MAY CAUSE MODERATE IRRITATION, NUMBNESS, REDNESS, DERMATITIS. EYE: IRRITANT. CAN CAUSE PAIN, SWELLING, DOUBLE VISION, CORNEAL INJURY AND PERMANENT BLINDNESS.

METHANOL (COMPONENT)
INHALATION/ORAL: POISON] CANNOT BE MADE NON-POISONOUS. HARMFUL/FATAL IF INHALED OR SWALLOWED. EFFECTS MAY BE DELAYED. OVEREXPOSURE MAY CAUSE EYE & RESPIRATORY IRRITATION, HEADACHE, NAUSEA, VOMITING, VISUAL IMPAIRMENT, CONFUSION, RESPIRATORY FAILURE, COMA & DEATH. LC50 (RAT) 4HR:64000 PPM. IF SWALLOWED, MAY CAUSE BLINDNESS, SEVERE GI IRRITATION CNS (BRAIN) EFFECTS. MASSIVE OVERDOSE MAY CAUSE HEART, LIVER, KIDNEY, BRAIN EFFECTS/DAMAGE. SKIN: CAN BE ABSORBED. PROLONGED OR REPEATED CONTACT MAY CAUSE MODERATE IRRITATION, NUMBNESS, REDNESS, DERMATITIS. EYE: IRRITANT. CAN CAUSE PAIN, SWELLING, DOUBLE VISION, CORNEAL INJURY AND PERMANENT BLINDNESS.

WATER (COMPONENT)
INHALATION: NON-TOXIC UNDER USUAL CIRCUMSTANCES. ENTRY OF WATER INTO THE LUNGS EXCLUDES OXYGEN AND ACTS AS AN ASPHYXIANT, AND CAN CAUSE DEATH (DROWNING). SKIN: MINIMAL IRRITATION WITH PROLONGED OR REPEATED CONTACT. WHEN HEATED, MAY CAUSE THERMAL BURNS TO SKIN AND EYE. ORAL: NON-TOXIC.

C.I. ACID BLUE 9 (COMPONENT)
NO DATA AVAILABLE FOR ANY ROUTE OF EXPOSURE.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA-------------------------

NO DATA AVAILABLE.

13. DISPOSAL CONSIDERATIONS

FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS. RCRA HAZARDOUS WASTE. DO NOT FLUSH TO DRAIN/ STORM SEWER. CONTRACT TO AUTHORIZED DISPOSAL SERVICE.

14. TRANSPORTATION INFORMATION

DOT-
PROPER SHIPPING NAME- FLAMMABLE LIQUID, N.O.S. (CONTAINS METHANOL)
HAZARD CLASS- 3 (FLAMMABLE LIQUID)
IDENTIFICATION NUMBER- UN1993
LABEL REQUIRED- PG II, FLAMMABLE LIQUID

IMDG- PROPER SHIPPING NAME- NO DATA AVAILABLE

IATA- PROPER SHIPPING NAME- NO DATA AVAILABLE

15. REGULATORY INFORMATION

SARA 302 THRESHOLD PLANNING QUANTITY. N/A

SARA 304 REPORTABLE QUANTITY ..... 11111 POUNDS

SARA 311 CATEGORIES- IMMEDIATE (ACUTE) HEALTH EFFECTS.. Y
DELAYED (CHRONIC) HEALTH EFFECTS.. Y
FIRE HAZARD ..... Y
SUDDEN RELEASE OF PRESSURE HAZARD. N
REACTIVITY HAZARD ..... N

WHEN A PRODUCT AND/OR COMPONENT IS LISTED BELOW, THE REGULATORY LIST ON WHICH IT APPEARS IS INDICATED.

METHANOL - CT MA NJ PA RI WV 01 07

01=SARA 313	02=SARA 302/304	03=IARC CARCINOGEN
04=OSHA CARCINOGEN	05=ACGIH CARCINOGEN	06=NTP CARCINOGEN
07=CERCLA 302.4	08=WHMIS CONTROLLED PROD.	
10=OTHER CARCINOGEN		
PA=PENNSYLVANIA RTK	NJ=NEW JERSEY RTK	CA=CALIFORNIA PROP 65
MA=MASSACHUSETTS RTK	MI=MICHIGAN 406	MN=MINNESOTA RTK
FL=FLORIDA	RI=RHODE ISLAND	IL=ILLINOIS
NY=NEW YORK	WV=WEST VIRGINIA	CT=CONNECTICUT
LA=LOUISIANA	ME=MAINE	OH=OHIO

THIS PRODUCT OR ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE U.S. TSCA INVENTORY.

16. OTHER INFORMATION

WINSHIELD WASHER FLUID

NONE

Appendix 3

Spill Reporting Form

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR	REPORT TIME	☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER _____-_____
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME		

C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS

F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION	
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION	
H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
I	SPILL SOURCE	SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS		

L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC

SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN

FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

APPENDIX 3

2008 Update of

Reclamation and Monitoring Costs

TABLE 1

POLARIS MINE DECOMMISSIONING, RECLAMATION AND MONITORING - ACTUAL EXPENDITURES AND ESTIMATED REMAINING LIABILITY

	APPROVED CLOSURE PLAN BUDGET		ACTUAL EXPENDITURES TO DATE						FORECAST OF REMAINING OUTSTANDING LIABILITY							
			Expended To December 31, 2007		Expended In 2008		Project Total To Date		2009 Forecast		2010 Forecast		2011 Forecast		Total Forecast to 2011	
	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals
DEMOLITION & RECLAMATION (BARE COSTS)																
MINE EQUIPMENT REMOVAL																
Hazardous Materials Removal	35,845		853		-		853								-	
Mine Refrigeration Plant	145,525		25,639		-		25,639								-	
Mobile & Mine Equipment	2,919		12,981		-		12,981								-	
Remove Salvaged Mine Equipment	20,754		-		-		-								-	
Misc Sub Contract Costs	45,957		28,540		-		28,540								-	
		$ 251,000		$ 68,013		$ -		$ 68,013		$ -		$ -		$ -		$ -
MINE ACCESS SEALING																
Seal Mine Portals	60,000		20,992		-		20,992								-	
		$ 60,000		$ 20,992		$ -		$ 20,992		$ -		$ -		$ -		$ -
CONCENTRATOR BUILDING																
Miscellaneous Materials	22,092		-		-		-								-	
Mill Equipment Clean-Up - Fuels	16,398		-		-		-								-	
Mill Equipment Clean-Up	99,900		40,613		-		40,613								-	
Hazardous Materials Removal	151,117		94,553		-		94,553								-	
Barge Demolition	608,592		443,526		-		443,526								-	
Misc Process Equipment Demolition & Removal	197,432		183,317		-		183,317								-	
Misc Sub Contract Costs	88,469		84,794		-		84,794								-	
		$ 1,184,000		$ 846,803		$ -		$ 846,803		$ -		$ -		$ -		$ -
CONCENTRATE STORAGE STRUCTURE & EQUIPMENT																
Concentrate Storage Equipment Clean-Up	26,117		1,905		-		1,905								-	
Conveyors	67,600		8,421		-		8,421								-	
Concentrate Storage Structure & Equipment	555,283		93,654		-		93,654								-	
		$ 649,000		$ 103,980		$ -		$ 103,980		$ -		$ -		$ -		$ -
SHIP LOADER & CONVEYOR																
Conveyors	50,000		24,592		-		24,592								-	
		$ 50,000		$ 24,592		$ -		$ 24,592		$ -		$ -		$ -		$ -
DOCK & SHORELINE																
Dock & Shoreline Reclamation	869,000		837,739		-		837,739								-	
		$ 869,000		$ 837,739		$ -		$ 837,739		$ -		$ -		$ -		$ -
THICKENER & TAILINGS LINES																
Hazardous Materials Removal	22,577		16,452		-		16,452								-	
Tailings Thickener	377,423		106,677		-		106,677								-	
		$ 400,000		$ 123,129		$ -		$ 123,129		$ -		$ -		$ -		$ -
GARROW LAKE																
Garrow Lake Siphons & Lake Drawdown	120,391		195,965		-		195,965								-	
Dam/Spillway Modifications	95,467		269,662		-		269,662								-	
Escalation Allowance	3,142		-		-		-								-	
		$ 219,000		$ 465,627		$ -		$ 465,627		$ -		$ -		$ -		$ -
CRF PLANT STRUCTURE & EQUIPMENT																
CRF Plant Equipment Clean-Up	7,002		1,040		-		1,040								-	
CRF Plant Equipment Removal	17,533		9,406		-		9,406								-	
CRF Plant Buildings Demolition	130,455		23,497		-		23,497								-	
Misc Sub Contract Costs	11,010		46,766		-		46,766								-	
		$ 166,000		$ 80,709		$ -		$ 80,709		$ -		$ -		$ -		$ -
ACCOMMODATION COMPLEX STRUCTURE & EQUIPMENT																
Accommodation Complex Building Demolition	249,000		72,318		-		72,318								-	
		$ 249,000		$ 72,318		$ -		$ 72,318		$ -		$ -		$ -		$ -
FUEL STORAGE & HANDLING EQUIPMENT																
Miscellaneous Materials	3,681		4,904		-		4,904								-	
Purge & Decommission Fuel Tanks	53,404		341,959		-		341,959								-	
Hazardous Materials Removal	50,645		547,319		-		547,319								-	
Fuel Pumping & Distribution Systems	87,270		11,173				11,173								-	
		$ 195,000		$ 905,355		$ -		$ 905,355		$ -		$ -		$ -		$ -
BUILDINGS & CONTAINERS																
Miscellaneous Materials	1,323		-		-		-								-	
Misc Warehouse / Shipping Equipment	1,221		3,292		-		3,292								-	
Misc Buildings Demolition	250,456		100,053		-		100,053								-	
		$ 253,000		$ 103,345		$ -		$ 103,345		$ -		$ -		$ -		$ -
MISC CONTRACTOR LABOUR																
Unallocated Labour	133,000		2,310		-		2,310								-	
		$ 133,000		$ 2,310		$ -		$ 2,310		$ -		$ -		$ -		$ -
GENERAL SITE GRADING																
Hazardous Materials Removal	44,719		90,114		-		90,114								-	
General Site Grading & Reclamation	7,129		828,869		-		828,869		13,000				50,000		63,000	
Escalation Allowance	4,152		-		-		0								-	
		$ 56,000		$ 918,983		$ -		$ 918,983		$ 13,000		$ -		$ 50,000		$ 63,000
LANDFILL RECLAMATION																
Landfill Reclamation	432,000		821,746		-		821,746								-	
		$ 432,000		$ 821,746		$ -		$ 821,746		$ -		$ -		$ -		$ -

POLARIS MINE DECOMMISSIONING, RECLAMATION AND MONITORING - ACTUAL EXPENDITURES AND ESTIMATED REMAINING LIABILITY

	APPROVED CLOSURE PLAN BUDGET		ACTUAL EXPENDITURES TO DATE						FORECAST OF REMAINING OUTSTANDING LIABILITY							
			Expended To December 31, 2007		Expended In 2008		Project Total To Date		2009 Forecast		2010 Forecast		2011 Forecast		Total Forecast to 2011	
	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals
CONTAMINATED SOILS - CLEANUP																
Metals & Hydrocarbon Contaminated Soils Cleanup & Disposal	366,623		2,627,104		-		2,627,104								-	
Hydrocarbon Contaminated Soils (By Polaris)	6,097		13,131		-		13,131								-	
Metals Contaminated Soils (By Polaris)	173,605		52,382		-		52,382								-	
U/G Handling & Disposal Of Contaminated Soils	48,675		1,012,154		-		1,012,154								-	
		$ 595,000		$ 3,704,771		$ -		$ 3,704,771		$ -		$ -		$ -		$ -
QUARRIES & MINE SURFACE RECLAMATION (EARTHWORK)																
Backfill & Re-Contouring	263,000		273,711		-		273,711								-	
		$ 263,000		$ 273,711		$ -		$ 273,711		$ -		$ -		$ -		$ -
MISC. DEMOLITION & CLEAN-UP																
Misc Unallocated Clean-Up / Demo	380,000		-		-		0		45,000		115,500		185,000		345,500	
		$ 380,000		$ -		$ -		$ -		$ 45,000		$ 115,500		$ 185,000		$ 345,500
EQUIPMENT PURCHASE/RENTAL																
Contractor Equipment Rental	5,274,900		5,216,572		-		5,216,572								-	
Contractor Misc Equipment Purchase	719,407		432,906		-		432,906								-	
Escalation Allowance	59,693		-		-		0								-	
		$ 6,054,000		$ 5,649,478		$ -		$ 5,649,478		$ -		$ -		$ -		$ -
MISC. SERVICES & SUPPLIES																
Misc Purchased Materials / Supplies	235,333		536,124		-		536,124								-	
Escalation Allowance	19,667		-		-		-								-	
		$ 255,000		$ 536,124		$ -		$ 536,124		$ -		$ -		$ -		$ -
FUEL																
Fuel Supply	3,294,536		4,216,186		-		4,216,186								-	
Fuel Taxes (Heating & Power Generation)	68,677		-		-		-								-	
Fuel Taxes (Equipment)	467,343		713,101		-		713,101								-	
Escalation Allowance	157,444		-		-		-								-	
		$ 3,988,000		$ 4,929,287		$ -		$ 4,929,287		$ -		$ -		$ -		$ -
MAINTENANCE OF EQUIPMENT & FACILITIES																
Mobile Equip Maintenance	1,296,759		7,682,560		-		7,682,560								-	
Building Maintenance	506,923		2,136,535		-		2,136,535								-	
Escalation Allowance	101,318		-		-		-								-	
		$ 1,905,000		$ 9,819,095		$ -		$ 9,819,095		$ -		$ -		$ -		$ -
PRE - PURCHASED EQUIPMENT (BY COMINCO)																
Construction Equipment - Purchase (By Owner)	541,000		893,766		-		893,766								-	
		$ 541,000		$ 893,766		$ -		$ 893,766		$ -		$ -		$ -		$ -
CONTRACTOR'S FIELD SUPPORT & SUPPLIES																
TRANSPORTATION (SHIPPING)																
Packing & Preparation	85,326		-		-		-								-	
Shipping Costs	948,661		3,411,970		-		3,411,970								-	
Escalation Allowance	78,013		-		-		-								-	
		$ 1,112,000		$ 3,411,970		$ -		$ 3,411,970		$ -		$ -		$ -		$ -
CONTRACTOR MOB, DEMOB & SUPERVISION																
Contractor Mob/Demob	61,883		208,747		-		208,747								-	
Contractor Supervisory/Admin Personnel	2,127,339		3,758,445		-		3,758,445								-	
Safety Services & Supplies	36,000		521,604		-		521,604								-	
Misc Temporary Services / Modifications	223,824		1,007,843		-		1,007,843								-	
Escalation Allowance	13,954		-		-		-								-	
		$ 2,463,000		$ 5,496,639		$ -		$ 5,496,639		$ -		$ -		$ -		$ -
MISC. SERVICES & SUPPLIES																
Communications & TV	374,000		256,412		-		256,412								-	
Escalation Allowance	31,000		-		-		-								-	
		$ 405,000		$ 256,412		$ -		$ 256,412		$ -		$ -		$ -		$ -
ACCOMODATIONS																
Catering	1,487,166		2,153,968		-		2,153,968								-	
Escalation Allowance	122,834		-		-		-								-	
		$ 1,610,000		$ 2,153,968		$ -		$ 2,153,968		$ -		$ -		$ -		$ -
TRAVEL & PERSONNEL																
Travel (Airfares & Expenses)	1,552,881		4,683,561		-		4,683,561								-	
Travel Premium - Revised Rotation Schedule	1,072,773		-		-		-								-	
Misc Personnel Transport	72,274		391,547		-		391,547								-	
Escalation Allowance	575,072		-		-		-								-	
		$ 3,273,000		$ 5,075,108		$ -		$ 5,075,108		$ -		$ -		$ -		$ -

POLARIS MINE DECOMMISSIONING, RECLAMATION AND MONITORING - ACTUAL EXPENDITURES AND ESTIMATED REMAINING LIABILITY

	APPROVED CLOSURE PLAN BUDGET		ACTUAL EXPENDITURES TO DATE						FORECAST OF REMAINING OUTSTANDING LIABILITY							
			Expended To December 31, 2007		Expended In 2008		Project Total To Date		2009 Forecast		2010 Forecast		2011 Forecast		Total Forecast to 2011	
	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals	By Code	Subtotals
CONTRACTOR INDIRECTS																
HO MOB & DEMOB SUPPORT																
Mob & Demob	1,912,000		1,912,376		-		1,912,376								-	
		$ 1,912,000		$ 1,912,376		$ -		$ 1,912,376		$ -		$ -		$ -		$ -
CONTRACTOR MANAGEMENT SUPPORT																
Personnel	3,928,932		3,928,932		-		3,928,932								-	
Safety & First Aid Personnel to Provide Overlap	184,068		183,644		-		183,644								-	
		$ 4,113,000		$ 4,112,576		$ -		$ 4,112,576		$ -		$ -		$ -		$ -
OTHER CONTRACTOR INDIRECTS																
Contractor's General Indirects	4,952,000		7,470,401		-		7,470,401								-	
		$ 4,952,000		$ 7,470,401		$ -		$ 7,470,401		$ -		$ -		$ -		$ -
ENGINEERING / PROJECT MANAGEMENT																
ENVIRONMENTAL SITE ASSESMENT																
Environmental Consultants - Site Assesment	275,787		354,711		-		354,711								-	
Site Assessment - Unallocated	207,874		105,263		-		105,263								-	
Escalation Allowance	2,339		-		-		-								-	
		$ 486,000		$ 459,974		$ -		$ 459,974		$ -		$ -		$ -		$ -
CLOSURE PLAN																
Environmental Consultants - Closure Plan	415,772		372,272		-		372,272								-	
Escalation Allowance	2,228		-		-		-								-	
		$ 418,000		$ 372,272		$ -		$ 372,272		$ -		$ -		$ -		$ -
ENGINEERING / SPECIAL CONSULTANTS																
Design Consultants - Dock / Loadout	1,316		1,320		-		1,320								-	
Design Consultants - Tailings / Garrow Lake	3,520		3,515		-		3,515								-	
Design Consultants - Dock / Loadout	79,684		65,354		-		65,354								-	
Design Consultants - Tailings / Garrow Lake	54,780		45,328		-		45,328								-	
Sitework & Demolition Procedures - Design Services	18,300		46,825		-		46,825								-	
Escalation Allowance	2,400		-		-		-								-	
		$ 160,000		$ 162,342		$ -		$ 162,342		$ -		$ -		$ -		$ -
PROJECT MANAGEMENT CONSULTANT (HO STAFF)																
Project Management - Salaries	411,069		1,289,847		-		1,289,847								-	
Project Management - Reimb Expenses	100,000		85,492		-		85,492								-	
Escalation Allowance	31,931		-		-		-								-	
		$ 543,000		$ 1,375,339		$ -		$ 1,375,339		$ -		$ -		$ -		$ -
CONSTRUCTION MANAGEMENT (FIELD STAFF)																
Construction Management - Salaries	2,142,878		1,915,004		-		1,915,004								-	
Escalation Allowance	179,122		-		-		-								-	
		$ 2,322,000		$ 1,915,004		$ -		$ 1,915,004		$ -		$ -		$ -		$ -
ENVIRONMENTAL TESTING AND SAMPLING																
Environmental Reclamation Supervision - Staff	337,123		1,038,747		-		1,038,747								-	
Escalation Allowance	29,550		-		-		-								-	
Environmental Reclamation Supervision - Testing	330,000		171,498		-		171,498								-	
Additional Sampling and Consultant Services (MMER)	0		354,386		-		354,386								-	
Escalation Allowance	26,327		-		-		-								-	
		$ 723,000		$ 1,564,631		$ -		$ 1,564,631		$ -		$ -		$ -		$ -
OWNER'S COSTS																
SALARIES & EXPENSES																
Teck HO Proj Mgmnt (Staff Lab)	374,631		476,911		-		476,911								-	
Teck HO Proj Mgmnt (Misc Material & Exp)	199,149		221,031		-		221,031								-	
Escalation Allowance	34,220		-		-		-								-	
		$ 608,000		$ 697,942		$ -		$ 697,942		$ -		$ -		$ -		$ -
OVERHEAD / HO SUPPORT																
Land Leases, Licences	175,000		96,979		-		96,979								-	
Miscellaneous Permits	45,000		16,889		-		16,889								-	
Insurance	445,900		319,459		-		319,459								-	
Property Taxes	495,000		180,412		-		180,412								-	
Home Office General Admin (Labour & Exp)	722,384		16,700		-		16,700								-	
Public Relations	74,292		58,718		-		58,718								-	
Legal	57,540		48,421		-		48,421								-	
Escalation Allowance	168,560		-		-		-								-	
Misc Owner's Overhead	6,324		13,882		-		13,882								-	
		$ 2,190,000		$ 751,460		$ -		$ 751,460		$ -		$ -		$ -		$ -
GENERAL ADMIN																
Closure Management - Polaris Personnel	54,000		-		-										-	
Escalation Allowance	2,880		-		-										-	
Closure Wrap Up	5,120		-		-										-	
		$ 62,000		$ -		$ -		$ -		$ -		$ -		$ -		$ -
POST RECLAMATION COSTS (2005 - 2011)																
SITE MONITORING AND HOLDING COSTS																
Annual Post Closure Environmental Monitoring (2005 to 2011)	510,000		862,300		261,000		1,123,300		242,500		324,500		248,500		815,500	
Final Sampling Program, Data Evaluation and Reporting in 2011	160,000		-		-		-								-	
Land Lease/Licence costs from 2005 to 2011	126,000		-		-		-								-	
Property Taxes - 2005 to 2011	70,000		-		-		-								-	
Escalation Allowance	135,000		-		-		-		-						-	
		$ 1,001,000		$ 862,300		$ 261,000		$ 1,123,300		$ 242,500		$ 324,500		$ 248,500		$ 815,500
TOTAL DECOMMISSIONING / RECLAMATION & MONITORING COSTS		**$ 47,500,000**		**$ 69,252,587**		**$ 261,000**		**$ 69,513,587**		**$ 300,500**		**$ 440,000**		**$ 483,500**		**$ 1,224,000**

Note: For actual and forecast expenditures have not included Land Lease costs, Licence Costs or Property Taxes as these do not represent a potential cost or liability to the government

APPENDIX 4

Garrow Lake Water Column

Monitoring Data

TABLE 1
GARROW LAKE WATER COLUMN MONITORING
STATION 262-3: Garrow Lake at Centre

Zinc Concentrations (mg/L)

Depth	18-Jan-02	13-Mar-02	4-Feb-03	29-Mar-03	1-Jan-04	3-May-04	13-May-05	25-Aug-05	22-May-06	21-Aug-06	3-Jun-07	25-Aug-07	27-May-08	29-Aug-08
0								0.130	0.227	0.193				
1									0.246	0.186				
1.5								0.131	0.231	0.19	0.235	0.168		0.177
2							0.244	0.136	0.235	0.199	0.23	0.180		0.183
3	0.26	0.30	0.25	0.28	0.236	0.234	0.247	0.134	0.241	0.193	0.244	0.180	0.257	0.180
4				0.28	0.197	0.227	0.244	0.243	0.237	0.192	0.241	0.176	0.250	0.179
5		0.32		0.29	0.209	0.247	0.228	0.267	0.25	0.187	0.234	0.185	0.251	0.179
6				0.29	0.207	0.229	0.239	0.265	0.211	0.186	0.228	0.181	0.270	0.175
7		0.32		0.29	0.197	0.227	0.241	0.284	0.218	0.183	0.245	0.180	0.246	0.228
8				0.29	0.189	0.231	0.248	0.271	0.233	0.186	0.231	0.177	0.250	0.249
9				0.30	0.702	0.816	1.120	0.552	0.359	0.287	0.246	0.218	0.249	0.241
10	0.34	0.37	0.60	0.87	0.932	0.764	0.535	1.250	0.491	0.987	0.917	0.916	0.792	0.252
11	1.40	1.6	1.40	0.96	0.279	0.315	0.134	0.151	0.0721	0.0903	0.0319	0.024	0.046	0.038
12	0.68	0.60	0.585	0.52	0.27	0.262	0.120	0.104	0.0383	0.0578	0.0288	0.020	0.024	0.033
13	0.46	0.48	0.70	0.44	0.251	0.234	0.0812	0.105	0.0226	0.0241	0.0279	0.024	0.019	0.016
14	0.45	0.460	0.52	0.41	0.229	0.211	0.0482	0.0457	0.024	0.0304	0.0204		0.020	
15	0.42	0.47	0.44	0.52	0.256	0.211	0.0378	0.0565	0.021	0.0297	0.0208	0.022	0.020	0.025
16	0.44	0.48	0.44	0.42	0.265	0.201	0.0429	0.0556	0.03	0.0287	0.0589		0.021	0.019
17	0.44	0.48	0.44	0.42	0.267	0.193	0.0435	0.0409	0.0294	0.032	0.0252	0.022	0.020	0.020
18	0.44	0.48	0.44	0.41	0.275	0.204	0.0440	0.0435	0.0314	0.0336	0.0238		0.020	0.017
19	0.44	0.48	0.45	0.42	0.266	0.202	0.0448	0.0425	0.0351	0.034	0.0208	0.021	0.021	0.018
20	0.43	0.50	0.46	0.40	0.260	0.197	0.0425	0.0413	0.0293	0.0346	0.0228	0.025	0.021	0.018
22	0.43	0.49	0.46	0.42	0.260	0.199	0.0407	0.0468	0.0301	0.0351	0.0218	0.024	0.052	0.019
30	0.43	0.50		0.38	0.0514	0.117	0.0310	0.0404		0.092	0.0453	0.035	0.020	0.021
35	0.43	0.54		0.08							0.529			0.015
40	0.44	0.53	0.07	0.06	0.234	0.0301	0.0214	0.0235	0.0558	0.0139				

Note: - did not graph the data from 30m depth for May 22/06 as there is clearly a data error. The Zn = 0.561 and the TSS was 111 mg/L. The sample must have been contaminated.

- Jun-07 didn't show the 35 m depth as the sample result was disturbed and incorrect data collected.
- 27-May-08 Didn't show the 36M depth sample as zinc was 2.01. Believe that the sample was contaminated by hitting the lake bottom and creating turbidity

TABLE 2
GARROW LAKE
WATER COLUMN MONITORING
STATION 262-3A: Garrow Lake Near Discharge

Depth	Zinc Concentrations mg/L									
	27-Jan-04	3-May-04	13-May-05	25-Aug-05	22-May-06	21-Aug-06	3-Jun-07	25-Aug-07	27-May-08	29-Aug-08
0				0.113	0.246	0.233				
1				0.112	0.244	0.218				
1.5				0.104	0.255	0.222	0.212	0.178		0.151
2			0.224	0.109	0.235	0.235	0.207	0.182		0.145
3	0.223	0.232	0.221	0.115	0.267	0.213	0.210	0.186	0.257	0.150
4	0.211	0.230	0.231	0.176	0.205	0.215	0.207	0.186	0.250	0.155
5	0.223	0.250	0.206	0.219	0.216	0.222	0.212	0.191	0.251	0.149
6	0.202	0.240	0.219	0.230	0.243	0.217	0.191	0.180	0.270	0.152
7	0.208	0.252	0.228	0.240	0.246	0.220	0.186	0.177	0.246	0.222
8	0.223	0.228	0.264	0.253	0.237	0.221	0.167	0.201	0.250	0.216
9	1.000	0.916	0.854	0.574	0.374	0.369	0.196	0.251	0.249	0.232
10	0.423	0.496	0.501	1.090	0.983	1.190	0.720	1.030	0.792	0.495
11	0.308	0.300	0.136	0.146	0.098	0.108	0.038	0.030	0.046	0.325
12	0.297	0.283	0.106	0.094	0.059	0.080	0.025	0.023	0.024	0.018
13	0.238	0.250	0.042	0.089	0.032	0.056	0.023	0.028	0.019	0.013
14	0.241	0.203	0.041	0.030	0.031	0.037	0.017	0.021	0.020	0.022
15	0.261	0.211	0.045	0.037	0.030	0.035	0.018	0.023	0.020	0.019
16	0.270	0.193	0.041	0.040	0.032	0.034	0.018	0.020	0.021	0.018
17	0.272	0.198	0.046	0.038	0.030	0.038	0.018	0.019	0.021	0.018
18	0.265	0.198	0.039	0.037	0.026	0.032	0.019	0.021	0.021	0.018
19	0.263	0.201	0.047	0.042	0.032	0.031	0.018	0.022	0.019	
20	0.266	0.206	0.042	0.035	0.029	0.031	0.021	0.020	0.021	
22	0.267				0.029			0.023		
30	0.076									
40	0.075									

Note - The Water Licence did not require sampling of this station prior to 2004

FIGURE 1
GARROW LAKE - Station 262-3
Trend In Zinc Concentrations In The Water Column 2002 to 2008

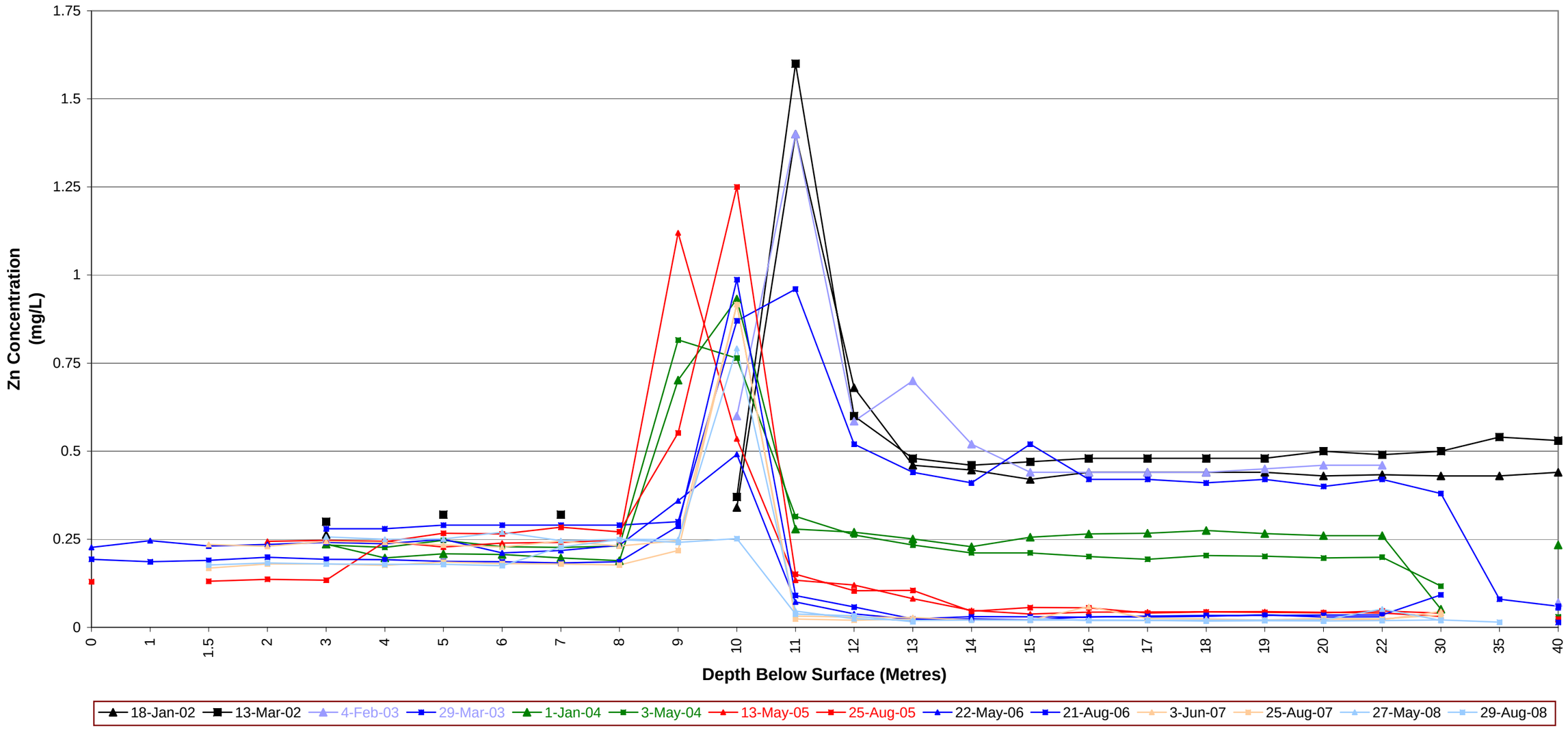


FIGURE 2
GARROW LAKE - Station 262-3A
Zinc Concentrations In The Water Column

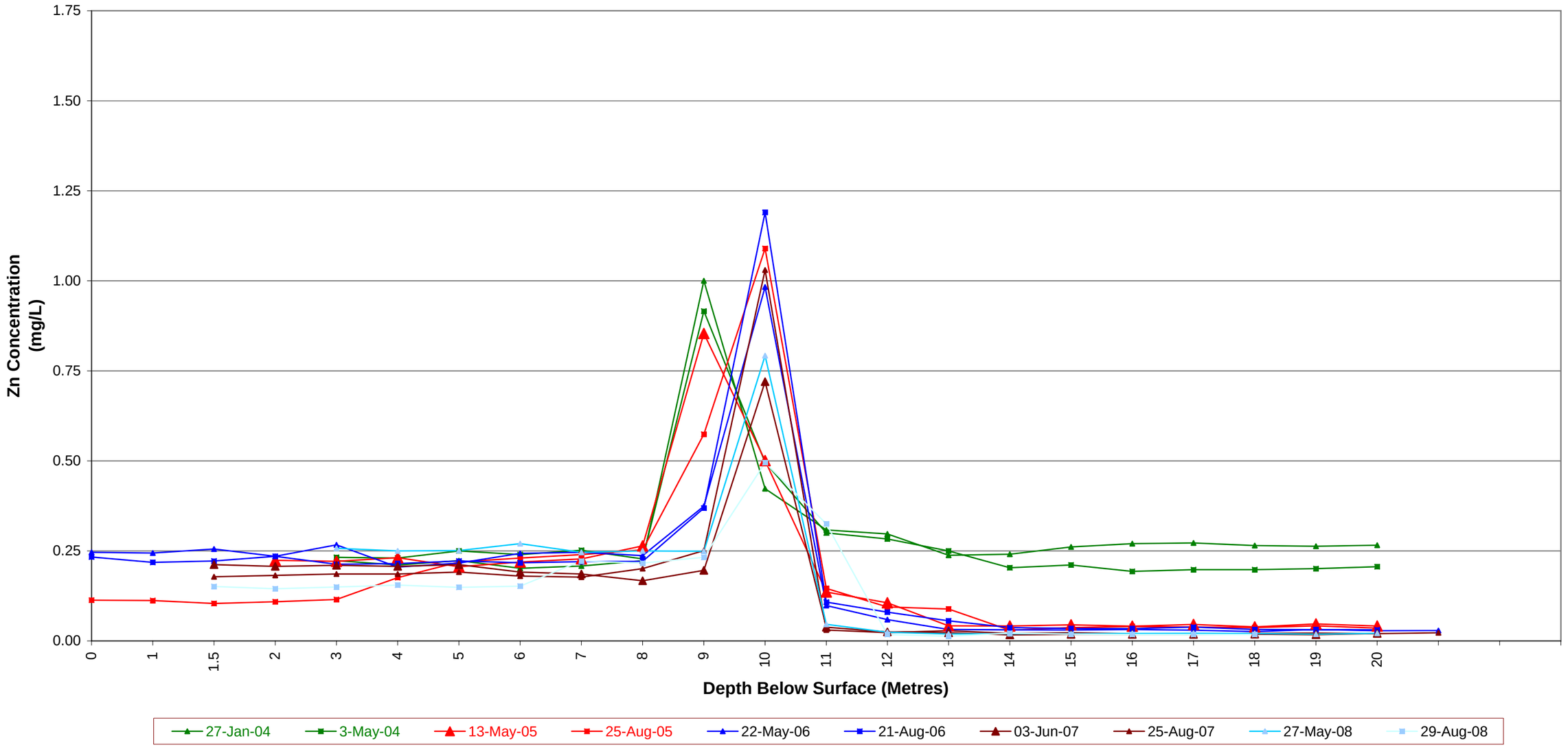
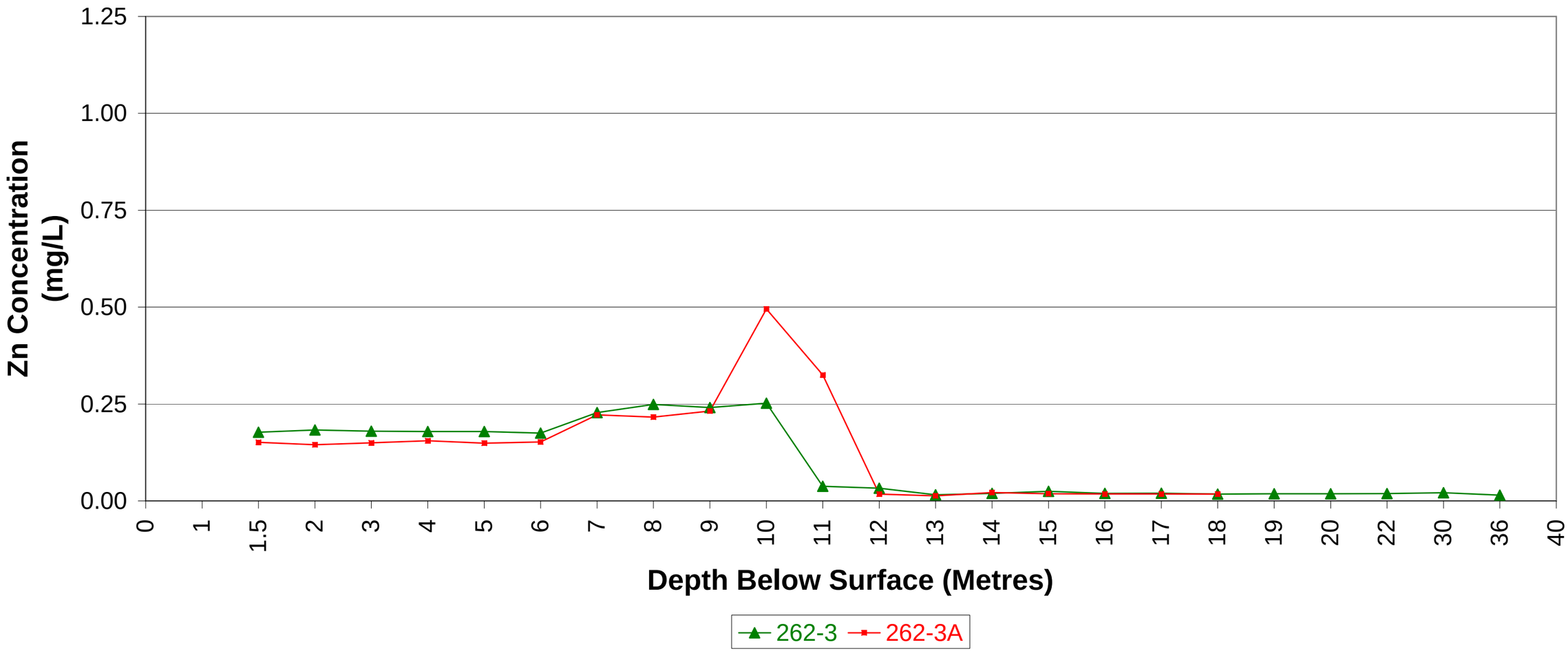


FIGURE 3
GARROW LAKE - August 2008
Comparision of Zinc Concentrations In The Water Column Between Monitoring Stations 262-3 and 262-3A



APPENDIX 5

Electronic Copy of Report on CD