IMPERIAL OIL
MATERIAL SAFETY DATA SHEET
TURBINE FUEL TYPE AVIATION, WIDE CUT

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

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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		MANUFACTURER/SUPPLIER:
Emergency 24 hr.	(519) 339-2145	IMPERIAL OIL
Technical Info.	(800) 268-3183	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.

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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.

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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.

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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

IMPERIAL OIL
MATERIAL SAFETY DATA SHEET
SMP ROCK DRILL GREASE

Date Prepared: April 06, 2000
Supersedes: April 02, 1999
MSDS Number: 14026

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1. PRODUCT INFORMATION

Product Identifier: SMP ROCK DRILL GREASE

Application and Use:
Lubricating grease

Product Description:

A grease, a mixture of lubricating oil, soap and additives

REGULATORY CLASSIFICATION

WHMIS:
Not a controlled product

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):
Not Regulated in Canada.

Please be aware that other regulations may apply.

TELEPHONE NUMBERS		MANUFACTURER/SUPPLIER:
Emergency 24 hr.	(519) 339-2145	IMPERIAL OIL
Technical Info.	(800) 268-3183	Products Division
		111 St Clair Avenue West
		Toronto, Ontario
		M5W 1K3
		(416) 968-4441

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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 #
Not applicable		

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid
Specific gravity: 0.910 at 15.0 deg C
Viscosity: 125.00 cSt at 40 deg C
Vapour Density: not available
Boiling Point: 400 deg C
Evaporation rate: < 0.1 (1= n-butylacetate)
Solubility in water: negligible
Freezing/Pour Point: 140 deg C Melt
Odour Threshold: not available
Vapour Pressure: <1 kPa at 38 deg C
Appearance/odour: Amber coloured grease, mild bland odour.

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

Negligible hazard at normal temperatures (up to 38 deg C).
Elevated temperatures or mechanical action may form vapours, mists or fumes which may be irritating to the eyes, nose, throat and lungs.
Avoid breathing vapours or mists.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Low toxicity.
Frequent or prolonged contact may irritate the skin.
High pressure greasing equipment is capable of injecting grease under the skin which may have severe health consequences.

INGESTION:

Low toxicity.

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 > 3160 mg/kg (Rabbit)
Inhalation : LC50 > 5000 mg/m3 (Rat)

OCCUPATIONAL EXPOSURE LIMIT:

ACGIH recommends:
For oil mists, 5 mg/m3.

Local regulated limits may vary.

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5. FIRST AID MEASURES

INHALATION:

In case of adverse exposure to vapours, mists and/or fumes formed at elevated temperature, or by mechanical action, immediately remove the affected victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

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

SKIN CONTACT:

Flush with large amounts of water. Use soap if available.
Remove severely contaminated clothing (including shoes) and launder before reuse.
If irritation persists, seek medical attention.
Consult a physician immediately if the material is injected under the skin from the misuse of high pressure greasing equipment.

INGESTION:

If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

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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 glasses with side shields. No other special precautions are necessary provided skin/eye contact is avoided.
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.
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.
Allow material to solidify and scrape up. Place material in suitable containers for recycle or disposal.
If liquid is too viscous for pumping, scrape up.
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.

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7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: >170 deg C COC ASTM D92

Autoignition: NA Flammable Limits: LEL: NA UEL: NA

GENERAL HAZARDS:

Low Hazard; liquids may burn upon heating to temperatures at or above the flash point.
Toxic gases will form upon combustion.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel.
Shut off fuel to fire.
Use foam, dry chemical or water spray to extinguish fire.
Respiratory and eye protection required for fire fighting personnel.
Avoid spraying water directly into storage containers due to danger of 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 under thermal decomposition.

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8. REACTIVITY DATA

STABILITY:

This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents

HAZARDOUS DECOMPOSITION:

none

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9. NOTES

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

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REVISION SUMMARY:
Since 2 April 1999, this MSDS has been revised in Section(s):
3, 6, 7

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10. PREPARATION

Date Prepared: April 06, 2000
Prepared by: Lubricants & Specialties
IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(800) 268-3183

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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."

General Chemical Canada Ltd.
Suite 850, 10655 Southport Rd., S.W.,
Calgary, Alberta T2W 4Y1 • (403) 278-9595 • Fax (403) 271-9333

General Chemical

SUBJECT: TOXICITY EVALUATION OF ROAD DUST ABATEMENT CHEMICALS
Author: Ministry of Environment, Province of British Columbia
Environmental Protection Division
Re: Summary of Findings/Report Interpretation

Please find attached the above mentioned report intended to evaluate and inform on the various road dust abatement chemicals commonly or proposed for use within and for the Province of B.C.

As the report is of a technical nature and not easily understood, we are providing a brief summary and interpretation of the terminology and results as follows:

TEST PARAMETERS:

1. 96-hr LC50 rainbow trout: this is the Lethal Concentration (LC) of product, expressed in parts per million (ppm) it takes to produce a 50% mortality rate in the test group over a 96-hour test time. Rainbow trout are considered to be higher in the food chain.

2. 48-hr LC50 daphnia: as above but over a 48-hour test duration. Daphnia is considered to be lower in the food chain than rainbow trout. Daphnia may also be a food source for rainbow trout.

3. Microtox LC50: this study is conducted on the low end of the food chain.

TEST RESULTS:
The bar graphs as illustrated are commonly misinterpreted. In this case, "big is not bad". The **LARGER OR LARGEST BAR GRAPH INDICATES THE LESS OR LEAST TOXIC MATERIAL.** The increments on the right hand side of the graphs express the parts per million of material it takes to product the desired effect (ie: 50% mortality). By example, it takes 45,000 ppm 35% Calcium Chloride solution to produce the same mortality rate as 9,000 ppm 30% magnesium chloride, or 6,400 ppm calcium lignosulphonate, etc. for the 96-hour LC50 on rainbow trout. As you can see, there are several orders of magnitude of difference between some products. A more thorough interpretation of the test results may be available from the author.

We have provided this submission as an information service only. We do not imply, nor should the language of this submission be construed as, a comparison of product and/or the relative toxicity of products.

General Chemical is an environmentally conscious company. General Chemical is an active member of the Responsible Care Program. Please call us for more information on all our products and services.

Responsible Care
A Total Commitment

British Columbia
Environment
V8V 1X5

18 May 1990

File:10-3-3-20

COPY

Mr. Larry deBoer, P.Eng.
Director
Geotechnical & Materials Engineering
Ministry of Transportation
and Highways
940 Blanshard St.
Victoria, B.C.
V8W 3E6

Dear Mr. deBoer:

Re: Toxicity Evaluation of Road Dust Abatement Chemicals

In follow-up to the Ministry of Transportation and Highways request of October 5, 1989, the Ministry of Environment has now completed the requested toxicity studies for following select dust suppressants:

Product	Supplier
25% Calcium chloride	General Chemicals
35% Calcium chloride	General Chemicals
77% Calcium chloride	General Chemicals
29-35% Magnesium chloride	McTar Petroleum
Sodium lignosulfonate (Raybinder 27% solids)	ITT Rayonier
Calcium lignosulfonate (Lignosite 25% solids)	Georgia-Pacific
Emulsion oil	Mohawk Oil Co.

(Sunlight Laundry Detergent - evaluated for the purposes of comparison to a common non-dust suppressant product.)

Bioassays for aquatic toxicity were conducted by the Ministry of Environment Aquatic Toxicity Laboratory, North Vancouver and included the following standard tests:

i) 96 hr LC50 rainbow trout;
ii) 48 hr LC50 daphnia; and
iii) Microtox EC50 (marine bacterial assay).

The results of these tests indicated that all of the products evaluated, with the exception of emulsion oil supplied by Mohawk Oil, were in the range of practically nontoxic to nontoxic (ie. LC50 or EC50 of >1000 parts per million to > 10,000 parts per million) for each of the above mentioned assays. Mohawk emulsion oil was found to be slightly toxic in the trout assays with a

calculated LC50 of 200 parts per million. By contrast, Sunlight laundry detergent was shown to be of several orders of magnitude greater in toxicity towards trout and daphnia with a reported LC50 value equal to 10 parts per million for both species and had an EC50 of 36 parts per million.

Samples of Lignosite (calcium lignosulfonate) and Raybinder (sodium lignosulfonate) supplied by Georgia-Pacific Corporation and ITT Rayonier Inc respectively, were submitted for dioxin and furan analysis, carried out for the Ministry of Environment by Seakem Analytical Services Ltd, Sidney, B.C. Laboratory testing found no traces of dioxins or furans in either product at the levels of detection.

We have assessed the results of these tests and our assessment has not indicated any definite areas of environmental problems. In this regard we have no objection to the continued use of these products, subject to the use of good application practices which minimize potential impacts on the receiving environment. In this regard the Ministry of Environment recommends the implementation of training programs for all individuals working with these materials, to familiarize them with guidelines for application and that a product quality control program be endorsed for all dust suppressants. The adoption of these measures will ensure the protection of both the public and the environment.

A detailed report of our findings and the results of testing programs is in preparation and will be forwarded to your office at a later date. Copies of the results of toxicity testing and dioxin/furan analysis are enclosed for your reference.

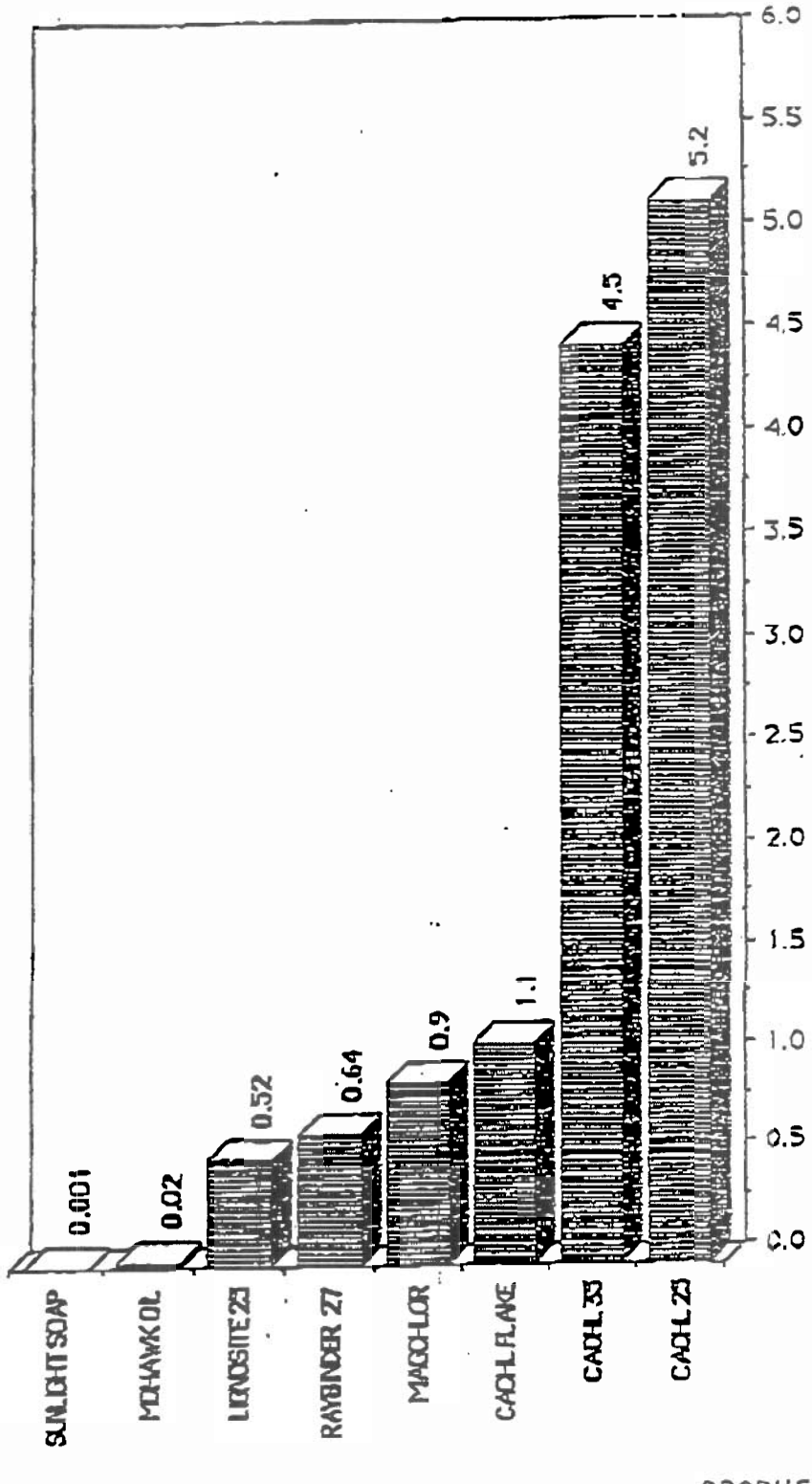
Thank you for your co-operation.

Yours very truly,

L.T. Hubbard, P.Eng.
A/Director
Municipal Liquid and
Industrial Waste Branch
Environmental Protection Division

Enclosures.

RAINBOW TROUT BIOASSAY RESULTS
DUST SUPPRESSANT STUDY



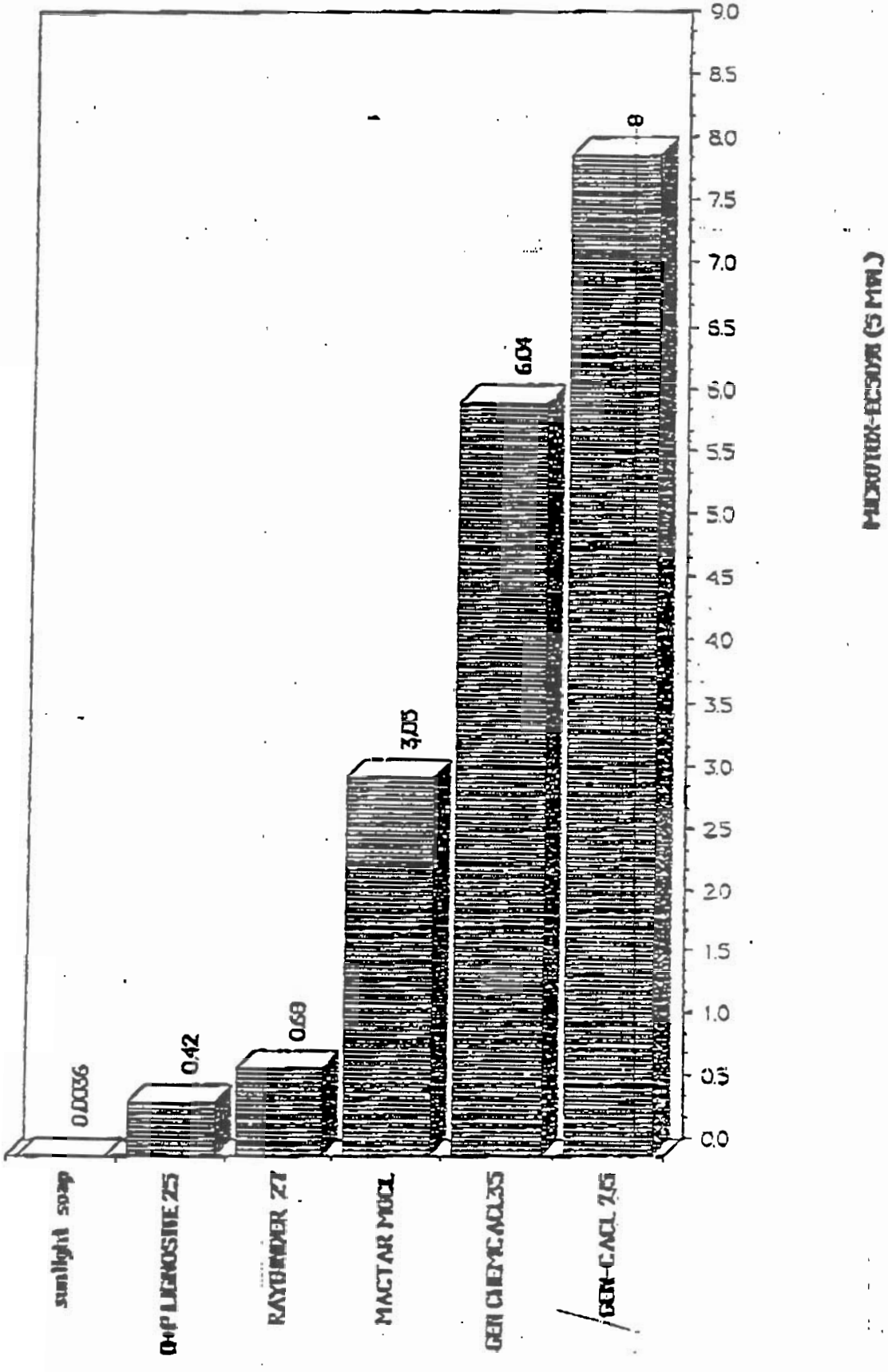
← 45,000 ppm

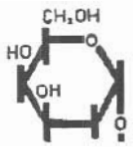
96 HR. LC50

DAPHNIA 48HRLC50 BIOASSAY RESULTS
DUST SUPPRESSANT STUDY

48 HR LC 50
on DAPHNIA

MICROTOX EC50 DATA SUMMARY
DUST SUPPRESSANT STUDY





Poly-Drill Drilling Systems
1824 - 104 Avenue, S.W.
Calgary, Alberta, Canada
T2W-OA8
(403) 259-5112 FAX (403) 255-7185

MATERIAL SAFETY DATA SHEET/FICHE SIGNALETIQUE

Section 1—PRODUCT IDENTIFICATION

PRODUCT TRADE NAME(S): Poly Drill CLAY TREAT II

SECTION 2—COMPOSITION

SECTION 3—PHYSICAL DATA

Boiling Point: 100 C
Solubility in Water: Soluble
Density (g/ml): 1.1
Appearance and Odor: Red. Characteristic slight odor.

Specific Gravity (@ 25 Deg.C.): 1.09
pH: 5.0 - 7.0 (1.0% solution)
Physical State: Liquid

SECTION 4—FIRE AND EXPLOSION DATA

Flash Point: >93.3 C
Conditions of flammability: Will burn after drying
Hazardous combustion products: Oxides of carbon and nitrogen and products of incomplete combustion.
Upper and Lower flammable limits: Not available
Extinguishing media: Use water spray, foam, dry chemical, or carbon dioxide.

SECTION 5—REACTIVITY

Chemical stability: Stable under normal conditions.
Hazardous Polymerization: Will not occur.
Incompatible substances: Avoid strong oxidizing and reducing agents.
Hazardous decomposition products: Not available.

SECTION 6—HEALTH HAZARD DATA

TOXICITY RATING: Practically non-harmful.
Routes of Exposure and Effects:
SKIN: Slight irritant: prolonged contact may cause skin irritation or dermatitis in some individuals
EYE: No effects of exposure expected with the exception of possible irritation.
INHALATION: If misted, no effects of exposure are expected.
Exposure limits: Contains trace acrylamide (SKIN). Exposure limit, TWAEV=0.03 mg/m(ONT. Reg. 654/86).
Contains traces of isopropanol. Exposure limit, TWAEV=400ppm, STEV=500ppm(ONT. Reg. 654/86).
Carcinogenicity: This product contains traces of acrylamide. Acrylamide is listed by IARC(Group 2B) and ACGIH(Group A2) as a possible human carcinogen.
Teratongenicity: Not available.
Mutagenicity: Not available.

SECTION 7—EMERGENCY AND FIRST AID PROCEDURES

SKIN: Wash exposed area with soap and water. If irritation or abnormalities persist, call a physician.
EYE: Immediately flush eyes with water for 15 minutes, if irritation or abnormalities persist, call a physician.
INHALATION: Remove to fresh air. If breathing becomes difficult, give oxygen and call a physician.
INGESTION: Don not induce vomiting: Call a physician immediately.

SECTION 8—HANDLING AND USE PRECTIONS

Storage requirements: keep container closed when no in use. Store in a cool dry location away from oxidizing and reducing agents.
Waste Disposal: product should be disposed of in accordance with applicable local, Provincial and Federal regulations.
Steps must be taken if product is released or spilled: clean spill areas thoroughly to avoid hazardous slippery conditions.

SECTION 9—INDUSTRIAL HYGIENE CONTROL MEASURES

Respiratory Protection: None normally required.
Ventilation: If mist and/or vapors are present, use air purifying respirator of self-contained breathing apparatus, but this is rarely required.
Eye Protection: Safety glasses, if personally preferred
Gloves: Generally not necessary. Personal preference.

SECTION 10—TOXICOLOGICAL PROPERTIES

G50 Microtox Analysis prepared by HydroQual Laboratories, Calgary, AB--97/07/23 Test#971127, Sample#97556-2:

Test Description	EC20	EC50	Pass/Fail
MTX	29 (26 - 32)	>91	PASS

SECTION 11—DEPARTMENT OF TRANSPORTATION INFORMATION

Shipping Name: Drilling Mud
Hazard Class: Not hazardous
Hazardous Substances: None
Cautionary Labeling: None required

POLY-DRILL DRILLING SYSTEMS LTD.
WATER HYDRAULICS,CHEMISTRY AND FILTRATION
SYSTEMS FOR DRILLING
1824 - 104 Ave., S.W. Calgary, Alberta, T2W OA8
TEL:403-259-5112, FAX:255-7185

MEMORANDUM:

DATE:Monday, March 11, 1996

ATTENTION:Mr. Gordon Cyr
COMPANY:Midwest Drilling

FROM:Bob Whipple

SUBJECT:Results from Sampling program-Lac De Gras

Dear Gordon,

An on site water sampling program was conducted on Drill 1186, Diamond Drill Hole 418-11 Tuesday, Feb. 27,96. The purpose of the program was to complete fish toxicity tests on drill water. The samples were collected from the mixing tank and from the casing for drill water returning to the recircualtion system. Bruno Zerba witnessed the sampling and the samples were presented to HydroQual Laboratories, Calgary within 24 hours of the sampling procedure.

DRILL WATER REUSLTS:

Sample #1. Poly-Drill Mix Tank- LC-50 18% 47,000 ppm

Sample #2. Return water from casing- LC-50 100%, no fish mortality.

During the time of sampling the drill water, the hole was at 71m. in the contact depth between the granites and the kimberlites. It should be noted that at this point of drilling the drilling fluid mixture is at a concentrated mixture of 1 L. of OBX, 1 L. of 133X and .25 L. of Clay Treat.

The use of actual field samples has more significance than the testing of stock mixed lab samples, as the physical attributes of the system are accounted for, including system pH, on site water quality and the presents of drill cuttings. The physical/chemical aspects of the ion exchange properties of the Poly-Drill formulas are clearly demonstrated by these test results. The concentrations of 133X and OBX are absorbed to the surface of the wellbore to prevent water hydration and maintain hole stability.

Very Best Regards,

Bob Whipple, Pres.

POLY-DRILL DRILLING SYSTEMS LTD.
WATER HYDRAULICS,CHEMISTRY AND FILTRATION
SYSTEMS FOR DRILLING
1824 - 104 Ave., S.W. Calgary, Alberta, T2W 0A8
TEL:403-259-5112, FAX:255-7185

MEMORANDUM:

Monday, February 09, 1998

ATTENTION: GORDON CYR
COMPANY: MIDWEST DRILLING

FROM:Bob Whipple

SUBJECT:POLY-DRILL SYSTEMS-MICROTOX TESTING

Dear Gordon,

Included are results of Microtox test carried out by HydroQall laboratories. The Microtox test is a bioassay that is recognized by the Alberta Energy and Utilities Board and Alberta Forestry as a method of determining the toxicity of drilling sumps and the treatments required for pumping off the fluids in land spreading operations. Fish studies may still be required if fluids are pumped to flowing bodies of water. I have discussed the Microtox test procedure with laboratories in British Columbia and Oceans & Fisheries, NWT, neither of these groups recognize the Microtox tests as a method of determining toxicity of fluids. Fish bioassays are currently the recognized tests for toxicity evaluations by Oceans & Fisheries. A table of currently completed tests is included.

Table of Microtox Test Results:

Test:	Product:	Concentration:	IC 50	Status	Conditions:	Comments:
70723	Poly-Drill 1330 (133X)	2L/1000L	>91	Pass	Field use 2L/1200	Pass concentration greater than field use.
26811	Poly-Drill Clay Treat	1L/100L	>100	pass	Field use .25L/1000	Pass concentration greater than field use.
70724	Poly-Drill OBXG	.5L/1000L	41	Fail	Field use 2L/1200	
	Poly-Drill OBXG	.5L/1000L	>91	Pass		Requires charcoal additions
70726	Poly-Drill OBX	.5L/1000L	39	Fail	Field use 2L/1200	
	Poly-Drill OBX	.5L/1000L	>91	Pass		Requires charcoal additions
70728	Poly-Pit	2L/1000L	0.25	Fail		Failed at concentration of 2L/1000L
	Table of Fish Test Results:					
60196	OBX/133X/Clay Tr.	Field Conc.	>100	Pass		Sample from field operations

Summary: Poly-Drill Drilling Systems will continue to evaluate test requirements for core-drilling applications with the groups involved. Microtox tests of Poly-Drill products will continue to be used for Alberta requirements, however fish tests will continue to be the main test procedure for toxicity of products used outside of Alberta. .

Very Best Regards,

Bob Whipple, Pres.