



CANADIAN PETROLEUM ENGINEERING INC.

1710, 407 2nd Street S.W., Calgary, Alberta, Canada T2P 2Y3

Tel: (403) 263-0752 • Fax: (403) 233-0859 • E-Mail: cpe@cadvision.com • www.cpe.ab.ca

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File-	1769

November 20, 2001

NWT Water Board
Ms. Vicki Losier
PO Box 1500
Inuvik, NT
Canada, X0E 0T0

Dear Ms. Losier:

**Emergency Response and Contingency Planning for the
Japex, JNOC, GSC, et al, Mallik Gas Hydrate Research Well, 2001/2002**

On behalf of Japex Canada Limited, the Japan National Oil Company, the Geological Survey of Canada, and participants, we enclose two copies of: Contingency Planning for Spills of Fuel or Other Hazardous Materials During Operations at Mallik 3L-38, Mallik 4L-38 & Mallik 5L-38.

Thank you for your assistance in helping us to ensure that this document will meet Water Board requirements. Please let us know if you have any questions or concerns.

Best regards,

Ed Fercho,
President



Cc:

Mr. H. Takahashi, Japex Canada
Mr. S. Dallimore, Geological Survey of Canada

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**Contingency Planning for Spills of
Fuel or Other Hazardous Materials
During Operations at
Mallik 3L-38, Mallik 4L-38 & Mallik 5L-38**

2001/2002



Prepared for:

**Japex Canada
Japan National Oil Company
Geological Survey of Canada**

**by
Canadian Petroleum Engineering Inc.
Calgary, Canada**

Introduction

Japex Canada Limited, the Japan National Oil Company, the Geological Survey of Canada and others plan to conduct a three well drilling program (Mallik 3L-38, Mallik 4L-38 and Mallik 5L-38) on an Imperial Oil Limited lease. Two other wells, Mallik L-38 (Imperial Oil Limited, 1972) and Mallik-2L-38 (Japex, JNOC, GSC et al, 1998) have been drilled at this location and the geology is very well known.

The objective of the new drilling program is to conduct research on a thick layer of gas hydrates known to exist at this site. The drilling program will not encounter any conventional hydrocarbons. Gas hydrates are icy compounds of methane and water, which remain in solid form when subjected to cold and pressure. Under normal atmospheric conditions, gas hydrates break down into water and gaseous methane and will disperse into the atmosphere. The three new wells will be drilled in a straight line, approximately 40 metres apart. The drilling program for the central well includes a core through the gas hydrates, extensive logging, as well as gas hydrate production stimulation trials. The drilling programs for the two outer wells, designated as observation wells, do not include coring. Those wells will be instrumented and monitored as various stimulation techniques are attempted at the central well.

Freeze-up in the area begins to take place in October. The entire drilling program will be conducted on frozen soils between mid-December and mid-March. Permafrost extends to a depth of approximately 600 metres. The drilling location is relatively flat with an elevation of approximately 3 metres above sea level. As a result, any spill onto the frozen soil would likely have limited opportunity to spread, especially if it was cleaned up quickly.

The site is subjected to occasional flooding during storm surges in the summer months. The operator recognizes the importance of ensuring that no harmful materials are left at the site, which could enter the water during these flooding events.

Operator Obligations:

Japex Canada, as operator of the project, is obligated to protect the safety of personnel and the environment from the effects of any spill of fuel or other hazardous material. To meet these obligations, Japex Canada commits to:

1. Do everything practicable to prevent the occurrence of any accidental spills at, or enroute to, its worksites.
2. Ensure that its worksites have trained personnel and adequate resources to appropriately respond to any spill that can reasonably be expected to occur.
3. Ensure that all hazardous materials in transport or in storage are accompanied by their respective Material Safety Data Sheets (these include information on their chemical composition, handling instructions, as well as material-specific spill clean-up instructions).
4. In the event of the occurrence of any spill, ensure that all necessary remedial actions are taken to guard the safety of all personnel and minimize the risk of damage to the environment.
5. Report all spills promptly and accurately to the NWT 24-hour Emergency Spill Line, to the National Energy Board, to the NWT Water Board and to Indian and Northern Affairs Canada. Japex Canada recognizes that it is against the law to withhold information or to provide wrong or misleading information to any regulators.

Responsibilities of the First Person at the Scene

Upon discovery of an accidental spill, the first person at the scene will:

1. Immediately act to protect the safety of any personnel in the immediate area.
2. Notify the Drilling Supervisor in order to ensure that any personnel at risk are advised and the spill response team is mobilized.
3. Follow the instructions of the Drilling Supervisor, to control the spill and control access to the area while awaiting the arrival of the spill response team.
4. Assist the spill response team as required.

Responsibilities of the Drilling Supervisor

1. Ensure that all personnel at the site are appropriately trained regarding the importance of spills and their prevention and management.
2. Establish a spill response team and provide the appropriate on-site training and drills to enable the team to effectively control and clean up any spills that can be reasonably expected.
3. Ensure that any contractors at the site are suitably trained, and equipped with adequate spill response materials, to respond to any spill that they might be associated with.
4. Include the topics of spill prevention and response in regular safety meetings and in site inspections. Keep accurate records of these activities.
5. Ensure that all fuel storage and fuel transfer activities take place at least 30 metres from water bodies, on relatively flat land. Fuel and other hazardous materials may not be stored on ice covered water bodies.
6. Ensure that all tanks holding fuel and other hazardous liquids are either double walled or surrounded by an appropriate protective berm.

7. Ensure that the work site is equipped with all of the required spill clean-up materials.
8. Ensure that an appropriately trained spill response team is available at the site at all times.
9. Report all spills, regardless of size, to the project manager and to the regulators listed in this plan.
10. Coordinate the spill control and clean-up operations as agreed with the project manager.
11. Ensure that transportation of contaminated materials meets TDG requirements.
12. Conduct a thorough spill incident investigation as soon as it is practicable. Ensure that the investigation identifies root causes and makes recommendations for reducing the risk and impact of future incidents.
13. Report the results of the incident investigation to the project manager and develop plans with him for improvements to training, procedures and equipment as well as for environmental recovery efforts.
14. Implement the improvements as agreed with the project manager.
15. Implement any recovery efforts and report on their effectiveness.

Responsibilities of the Spill Response Team

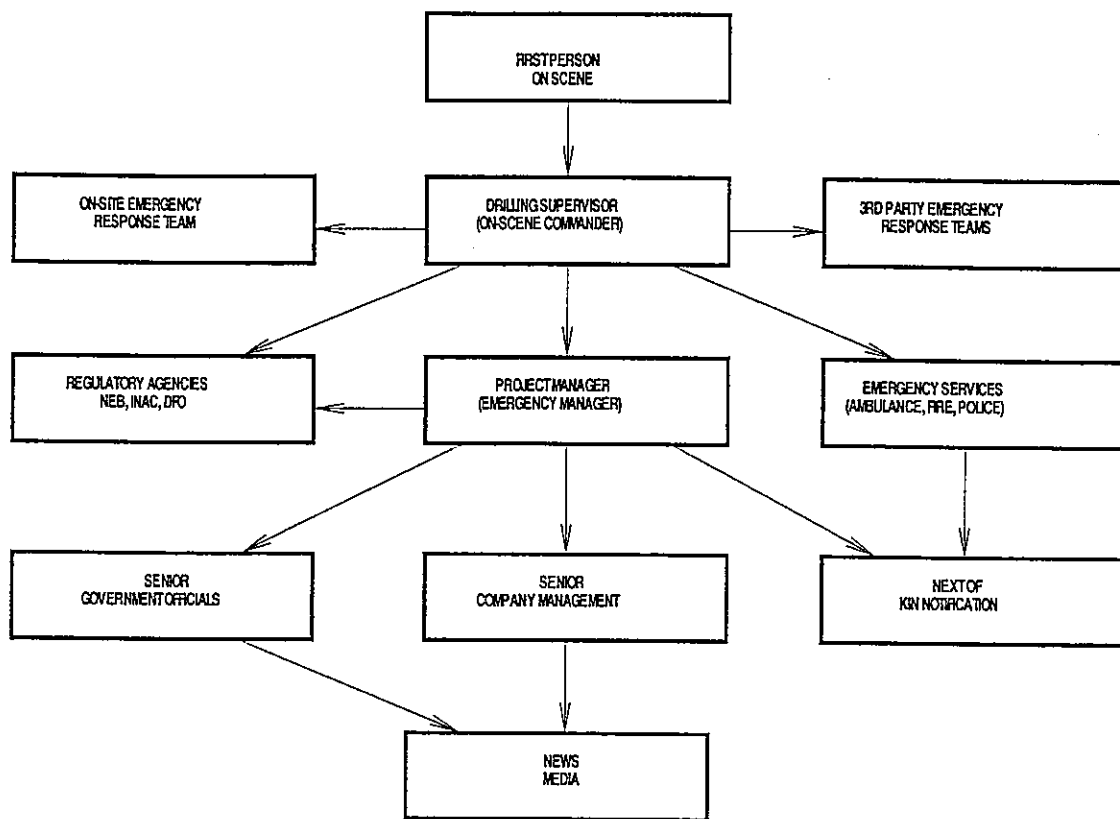
The spill response team will be trained in spill management and will have access to the spill response equipment at the operating site. The drilling supervisor will deploy the spill response team, which includes on-site management, operations personnel, as well as MDIOS contract personnel. On arrival at the spill scene, the team will:

1. Make an initial assessment of the site.
2. Secure the site to ensure the safety of all personnel.
3. Ensure any ignition sources are isolated or removed.
4. If the spill is ongoing, take the appropriate measures to stop the spill at the source.
5. If required, deploy booms and construct dikes or trenches in order to minimize spread of the spill. Take extra care to guard against contamination of any water bodies.
6. Recover as much of any spilled liquids as possible by pumping or scooping into empty drums or tanks for transportation to an approved disposal site. MATCO Transportation of Inuvik has hazardous waste hauling capability and operates an oil-burning furnace.
7. Use sorbents to clean up any remaining liquids.
8. Recover the sorbents and place into steel drums for disposal at an approved site.
9. Recover any contaminated snow and place into steel barrels for disposal at an approved site.
10. With approval from the National Energy Board, the Water Board and Indian and Northern Affairs Canada, contaminated materials may be burned on site.
11. Pick up any burn residue for transport to an approved disposal site.
12. Follow instructions from Indian and Northern Affairs Canada regarding in situ treatment of any contaminated soil, or its transportation to an approved site for disposal.

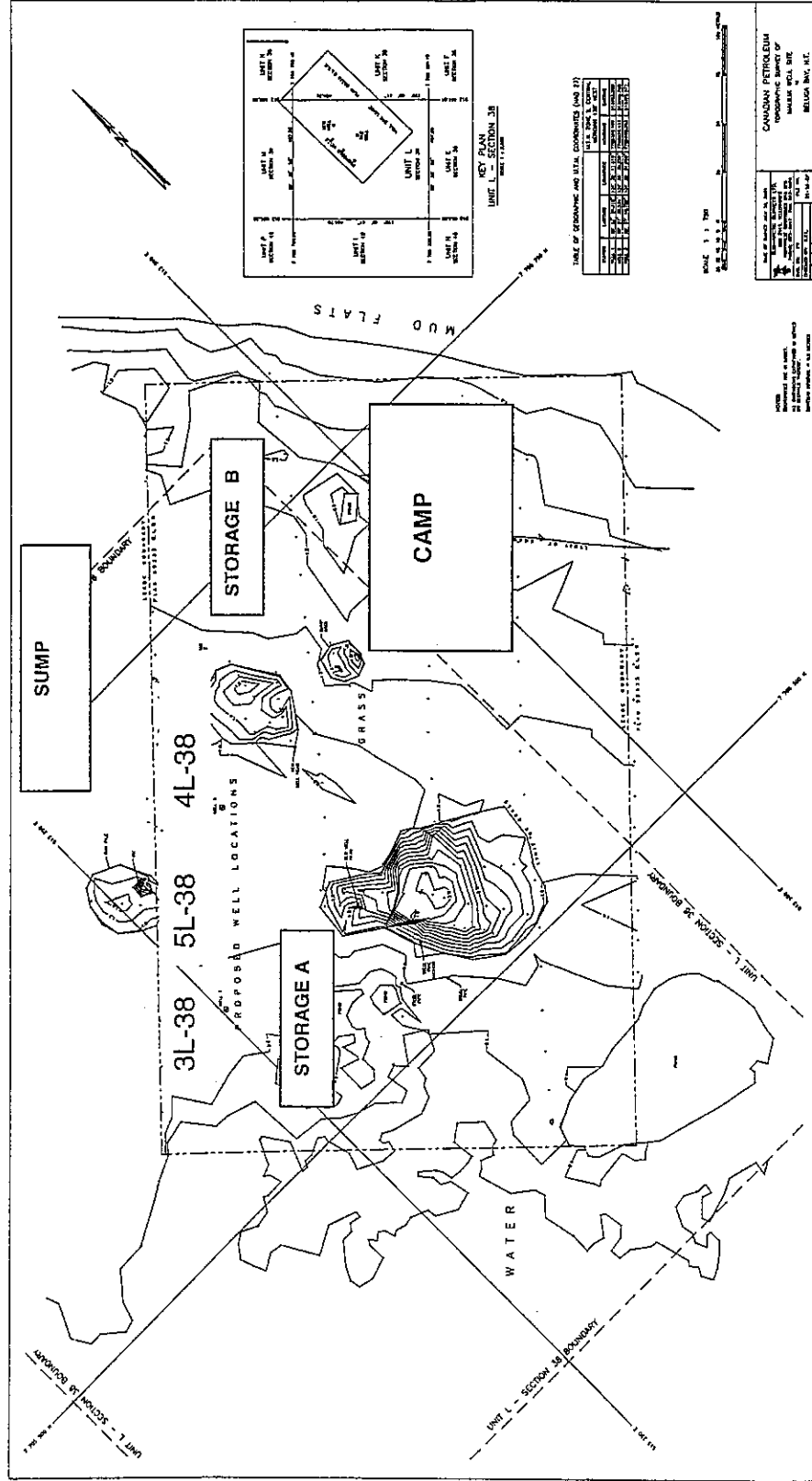
Responsibilities of the Project Manager

1. Ensure that the drilling supervisor is suitably qualified and that he has the appropriate resources to minimize the risk of spills and to appropriately respond to any that might occur.
2. Ensure that the drilling supervisor establishes and trains a spill response team and that he conducts sufficient drills to ensure that the team is capable of managing spills effectively.
3. Ensure that all contractors hired for the project are reliable and experienced in spill prevention and control measures.
4. Review with the drilling supervisor, all of the spill prevention and response measures that will be in place at the work site.
5. Ensure that inspections and safety meetings take place regularly at the worksite and that they include spill prevention and response measures.
6. Provide any assistance required by the drilling supervisor for spill response.
7. Provide any assistance required by the drilling supervisor for spill incident investigation and reporting.
8. Immediately file an initial report with regulators.
9. Review the spill incident investigation report and make resources available to minimize recurrences.
10. Provide the formal spill report to regulators. Discuss each event with them to determine the remedial measures to be put into place.
11. Assist the drilling supervisor with the implementation of any improvements that will reduce the risk and consequences of any future spills.
12. Provide reports on the environmental recovery efforts to the regulators and develop recommendations for improvement.

Communications Network Tree



Site Map and Susceptible Areas



Reducing Risk of Spills

Risk of spills of hazardous materials at the Mallik site will be minimized by implementation of the following controls:

1. There will be limited requirement for hazardous materials at the site.
2. Appropriate containers and equipment will be used for storing and handling any hazardous materials that are used.
3. Appropriate procedures handling hazardous materials will be employed in accordance with their respective MSDS.
4. Personnel handling hazardous materials will be appropriately trained and supervised.

Spill Clean-up Equipment

Given the location of the site, and the operating season, any foreseeable spill at site would take place on snow covered and frozen soil. Clean-up operations would be conducted as described above in Responsibilities of the Spill Response Team, using the equipment and supplies available at the well site and camp site as marked on the attached map:

- One 3" fuel transfer pump with hoses and couplings.
- Sufficient plastic sheeting to line a trench or dike.
- Four non-sparking scoop shovels.
- Two empty drums with the lids removed.
- Sorbent material.

In the event of any large spill, the following heavy equipment will be available at all times to contain the spill and clean up any contaminated soil:

- One vacuum truck
- Two loaders
- One caterpillar

In addition, Petro-Canada has made available the following spill kit, specifically designed for large spills in winter:

- 12 aluminum scoop shovels
- chain saw (18")
- Portable light kit
- 3 portable (5000 watt) generators and fuel in CSA containers
- Herman-Nelson heater
- 15 bale/barrel sorbent socks
- 25 bale/barrel sorbent pads
- loose 10 bale/barrel sorbent
- 2 one cubic metre totes
- 2 pick axes
- 4 large impervious tarps
- 5 boxes of disposable coveralls
- 5 boxes of Vitron or Nitrile gloves with winter lining
- documentation kit

- tool kit with sockets, wrenches, multi-tip screwdrivers, pliers, utility knife, wire cutters, files, hack saws, hammers, chain saw maintenance materials, tape, wire, tie wraps, etc.

Each vehicle, which will be transporting fuel or hazardous liquids to the site, at any time during the mobilization, drilling, or demobilization programs, will be equipped with:

- A non-sparking scoop shovel.
- An empty drum with lid removed.
- Sorbent material.
- Appropriate communications equipment to request assistance if required.

Spill Response Training

The Drilling Supervisor and the Rig Manager, who are at the site at all times, hold the following safety, environment, and spill response training and certification:

- 2nd Line Well Control
- Environmental Issues
- H2S Alive
- Hydrocarbon Gas Hazards and Detection
- Rig Rescue
- Loss Control Leadership
- Spill Responder
- Transportation of Dangerous Goods (TDG)
- Workplace Hazardous Materials Information Systems (WHMIS)

Training for the spill response team will be given on site by the drilling supervisor or his designate and will include all of the topics listed above as Responsibilities of the Spill Response Team. The drilling supervisor will ensure that the spill response team has conducted sufficient drills in order to ensure that they are capable of managing spills effectively. The drilling manager will document all training and drills that take place.

Training for all employees on site will be given by the drilling supervisor or his designate and will include all of the topics listed above under Responsibilities of the First Person at the Scene. The drilling supervisor will ensure that all contractors on site have at least an equivalent amount of training and/or experience.

Hazardous materials at the Mallik will consist of diesel fuel, lubricating and hydraulic oils, ethylene glycol and methanol. In addition, non-toxic drilling mud additives will be employed at the site. The containment and handling of these materials is described as follows.

Fuel (Storage Site A)

Fuel stored at the Mallik site will consist of 100 m³ of diesel stored in two 50 m³ Enviro tanks and two 70 m³ double walled tanks. As a result, there will be a storage over-capacity of more than 100% for the fuel kept on location. All tanks will have been inspected and approved prior to filling. Each Enviro tank will be situated within an integral trough, which is capable of retaining the entire

contents of the tank plus 10% in the event of a leak. In the event of a leak, the contents of the trough and/or damaged tank would be pumped into one or more of the other tanks at the site. Any traces of fuel remaining at the bottom of the trough after the pumping has been completed would be wiped up with sorbents.

In the event of a spill during a fuel transfer, contaminated snow and soil would be shovelled into one of the empty drums available for this purpose. With approval from NEB and INAC, any contaminated sorbents or soils would either be burned on site or taken to the Inuvik landfill site for disposal.

Lubricants and Hydraulic Oils (Storage Site A)

A total of 3 m³ of lubricating and hydraulic oils will be stored on site in barrels. All barrels will be inspected prior to unloading at the site in order to ensure that they are in good condition. In addition, the barrels and the barrel storage area will be inspected for leaks daily. All barrels containing lubricants or hydraulic fluid will be located at least 100 m away from the nearest water body in a depression in the soil. In the event of a leak, the leaking barrel would be pumped into a secondary container and any contaminated soil or sorbents would either be burned on site or taken to the Inuvik landfill site for disposal as directed by INAC and NEB.

Methanol (Storage Site A)

Less than 1 m³ of methanol will be kept at the site. All barrels will be inspected prior to unloading at the site in order to ensure that they are in good condition. In addition, the barrels and the barrel storage area will be inspected for leaks daily. All barrels of methanol will be located at least 100 m away from the nearest water body in a depression in the soil. In the event of a leak, the leaking barrel would be pumped into a secondary container and any contaminated soil or sorbents would be burned on site.

Ethylene Glycol (Storage Site A)

A total of 29 m³ of ethylene glycol will be kept at the drilling site in 1 m³ containers. This material will only remain at the site for a short time during testing operations. All containers will be inspected prior to unloading at the site in order to ensure that they are in good condition. In addition, the glycol containers and the container storage area will be inspected for leaks daily. All containers of ethylene glycol will be located at least 100 m away from the nearest water body in a depression in the soil. In the event of a leak, the leaking container would be pumped into the spill tank and hauled away for recycling. Any contaminated soil or sorbents would be taken to the Inuvik landfill site for disposal on approval from NEB and INAC.

Drilling Mud Additives (Storage Site B)

In addition to the liquids listed above, the drilling program will make use of a number of drilling mud additives that are pre-approved and considered non-toxic in the concentrations being used. The additives will be kept in a dry state and will be stored in C-can containers at the site prior to use. Any spills of these

powdered materials would be cleaned up by shovels and deposited into containers or into the mud sump to ensure that they are not left on the soil surface. Upon completion of the drilling program, the used drilling mud, with non-toxic additives, will be buried in the mud sump.

Drilling Mud Additive	Amount On Site
KCl	2680 sacks
Xanvis	190 sacks
KOH	40 sacks
Lecithin	100 pails
Starch	110 sacks
PAC Louis	60 sacks
Barite	1500 sacks
Sawdust	300 sacks
Kwik Seal	150 sacks
2-Ethyl Methanol	30 pails
Bicarbonate	40 sacks
Citric Acid	50 sacks
Alcomer A1103	30 sacks
Soda Ash	30 sacks

Contacts for Reporting and Managing Spills

Agency	Name	Phone
NEB	John Korec	(403) 299-6614
NEB	Switchboard	(403) 292-4800
NWT Water Board	Vicki Losier	(867) 669-2772
INAC	Rudy Cockney	(867) 777-3361
24 – hour Spill Line	Phone	(867) 920-8130
24 – hour Spill Line	Facsimile	(867) 873-6924
MATCO	Tamie Littlechilds	(867) 777-2733

Additional Contacts

CPE Project Manager

Ed Fercho; Office (403) 263 0752, Home (403) 873 1480

CPE Assistant Project Manager

Lorne Hammer; Office (403) 263 0752, Home (403) 242 3847

Japex (Operator) Manager

Hideaki Takahashi; Office (867) 777 3838, Home (867) 777 2801

GSC Geologist

Scott Dallimore; Office/Home (867) 777 3838

NEB Operations Specialist

Rick Fisher; Office (403) 299-2798, Home (403) 220-0893

NEB Occupational Health and Safety Inspector

Rick Turner; Office (403) 299-3868, Home (403) 257-0840

NEB Petroleum Engineering Specialist

Chris Knoechel; Office (403) 299-3866, Home (403) 241-0047

NEB Drilling Engineering Specialist

Andrew Graw; Office (403) 299-2790, Home (403) 547-3073

NEB Environmental Assessment Officer (Spills)

John Korec; Office (403) 292-6614, Home (403) 275-6256

NEB Environmental Specialist

Tod Collard; Office (403) 299-2769, Home (403) 256-1902

NEB Chief Safety Officer

John McCarthy; Office (403) 299-2766, Home (403) 240-2354

NEB Chief Conservation Officer
Terry Baker; Office (403) 299-2792, Home (403) 239-5032

NEB Calgary Main Office
Phone (403) 292-4800, Main Fax (403) 292-5876, Alternate Fax (403) 292-5875

APPENDIX

**Material Safety Data Sheets
For Chemicals Used at Mallik 2001/02**



MATERIAL SAFETY DATA SHEET

#1700, 407 - 2nd Street S.W., Calgary, Alberta T2P 2Y3
Telephone: (403) 269-2242 Fax: (403) 269-2251

Section I: IDENTIFICATION OF PRODUCT

Product Name: **ALKAPAM (A-1103 & 1703)**
Product Use: Drilling Mud Additive
Chemical Family: COPOLYMER OF ACRYLAMIDE AND SODIUM ACRYLATE
WHMIS CLASSIFICATION: Not a Controlled Product Under WHMIS
TDG CLASSIFICATION: Not Dangerous Goods
WORK PLACE HAZARD: Not Applicable
PACKAGE GROUP: Not Applicable
PIN: Not Applicable

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	LD(50)	LC(50)
No Hazardous Ingredients.				

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN EYE CONTACT INHALATION INGESTION

EFFECTS OF ACUTE EXPOSURE:

SKIN CONTACT: No effects of exposure expected due to contact. Prolonged contact may cause skin irritation or dermatitis in some individuals.
EYE CONTACT: No effects of exposure expected with the exception of possible irritation.
INHALATION: May cause sneezing, slight irritation of nose and throat.
INGESTION: LD₅₀ (oral rat): >2,000 mg/kg.
EFFECTS OF CHRONIC EXPOSURE: Skin irritation of dermatitis may occur upon frequent of prolonged contact. Repeated of prolonged contact may cause sensitization in some individuals.
EXPOSURE LIMITS: TWAEV + 0.03 mg/m³
CARCINOGENICITY: Traces of acrylamide, a suspected carcinogen.

Section IV: FIRST AID MEASURES

EYE CONTACT: Flush eyes with running water for at least 15 minutes. If irritation or abnormalities persist, call a physician.
SKIN CONTACT: Wash exposed area with soap and water. If irritation or abnormalities persist, call a physician.
INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.
INGESTION: Do not induce vomiting. If conscious, dilute by giving two glasses of water. Call a physician immediately.

ALKAPAM (A-1103 & 1703)

Section V: PHYSICAL DATA

APPEARANCE AND ODOR:	White granular solid; faint odor		
SPECIFIC GRAVITY:	0.80 g/cc		
BOILING POINT (°C):	Decomposes	MELTING POINT (°C):	Not Available
SOLUBILITY IN WATER:	Soluble	pH @ 1.0%:	6.5-8.5
PERCENT VOLATILE BY VOLUME:	Not Available	EVAPORATION RATE:	Not Available
VAPOUR PRESSURES (mm Hg):	Very Low	VAPOUR DENSITY (Air = 1):	0.80 g/ml

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT:	Not Applicable
FLAMMABLE LIMITS:	Not Applicable
CONDITIONS OF FLAMMABILITY:	Requires a source of ignition
EXTINGUISHING MEDIA:	Dry chemical, foam, water and CO ₂
SPECIAL FIRE FIGHTING PROCEDURES:	Self-contained respirators required for fire fighting personnel. Water may cause excessive slipperiness.
HAZARDOUS COMBUSTION PRODUCTS:	Oxides of carbon and nitrogen and products of incomplete combustion.
UNUSUAL FIRE AND EXPLOSION PROCEDURES:	Requires a source of ignition, the presence of air, and a temperature greater than the flash point

Section VII: REACTIVITY DATA

STABILITY Stable Unstable


INCOMPATIBILITY (conditions to avoid): Avoid contamination with active substances.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing and reducing agents
HAZARDOUS DECOMPOSITION PRODUCTS: Not Available
HAZARDOUS POLYMERIZATION:

Will not occur May Occur

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:	Suggest NIOSH/MESA approved dust mask
VENTILATION:	As required to prevent exposure
PROTECTIVE GLOVES:	Suggest plastic or rubber
EYE PROTECTION:	Suggest goggles
OTHER PROTECTIVE EQUIPMENT (specify):	Clothing as required to prevent contact.



ALKAPAM (A-1103 & 1703)

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid prolonged or frequent contact when handling material. Do not inhale dust or breathe vapour. Wear a NIOSH-approved mechanical-filter respirator, if adequate ventilation cannot be provided. Avoid skin or eye contact. Protective measures during repair/maintenance of equipment: Wash equipment thoroughly with steam or warm water until clean. Check for flammables with an "explosion meter" and also check the oxygen level with an oxygen meter. In all cases, follow good industrial safety practices before entering equipment.

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

Ventilate area. Wear rubber boots, gloves and a self-contained breathing apparatus if ventilation is not adequate. Collect into waste container. Avoid raising dust. Wash spill site after material pick-up. Water solutions are very slippery. May constitute a hazard following a spill.

WASTE DISPOSAL METHOD

Dispose of waste according to federal, provincial, and local regulations. Containers should NOT be reused. Containers should be disposed of in accordance with government regulations.

Section IX: PREPARATION

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

DATE ISSUED: December 1, 1993

BY: Product Safety Committee

DATE UPDATED: April 1, 2002

Section I: IDENTIFICATION OF PRODUCT

Product Name: **BARITE**
Product Use: Drilling Mud Additive
Chemical Family: BARIUM SULPHATE; BARITE

WHMIS CLASSIFICATION: Not a Controlled
Product Under WHMIS

TDG CLASSIFICATION: Not Dangerous
Goods

PACKAGE GROUP: Not Applicable

WORK PLACE HAZARD: Not Applicable

PIN: Not Applicable

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	LD(50)	LC(50)
No Hazardous Ingredients				

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN EYE CONTACT INHALATION INGESTION

ACUTE (Short Term Exposure): Cough if exposed to dust at levels higher than TLV's

CHRONIC (Long Term Exposure): According to Mountain Minerals Company Ltd., this Barite does not contain respirable crystalline silica in amounts considered significant under WHMIS guidelines.

Section IV: FIRST AID MEASURES

No first aid measures are suggested for Chronic (long term exposure).

For Acute (short term exposure) remove patient from dusty environment.

SKIN: Wash with soap and water. If adverse symptoms develop, seek medical attention.

EYE: Flush eyes with running water for at least 15 minutes. If adverse symptoms develop, seek medical attention.

INHALATION: Remove to fresh air.

INGESTION: No ill effects expected.

BARITE

Section V: PHYSICAL DATA

APPEARANCE AND ODOUR: Grey white powder; Dirt-dust like odour
SPECIFIC GRAVITY: 4.20 +
BOILING POINT (°C): Not Applicable
MELTING POINT (°C): Not Applicable
SOLUBILITY IN WATER: Insoluble pH @ 1.0%: 7 - 8
PERCENT VOLATILE BY VOLUME: Not Applicable VAPOUR PRESSURES (mm Hg): N/A
EVAPORATION RATE: Not Applicable VAPOUR DENSITY (Air = 1): N/A

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT: Not Applicable
FLAMMABLE LIMITS: Not Applicable
EXTINGUISHING MEDIA: Not Applicable
SPECIAL FIRE FIGHTING PROCEDURES: Not Applicable
UNUSUAL FIRE AND EXPLOSION PROCEDURES: Not Applicable

Section VII: REACTIVITY DATA

STABILITY Stable Unstable

INCOMPATIBILITY (conditions to avoid): None
HAZARDOUS DECOMPOSITION PRODUCTS: None
HAZARDOUS POLYMERIZATION:

Will not occur May Occur

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Suggest NIOSH/MSHA approved respirators for silica bearing dust
VENTILATION: Yes, if practical; personal air supply may be useful
PROTECTIVE GLOVES: None required
EYE PROTECTION: Suggest goggles
OTHER PROTECTIVE EQUIPMENT (specify): Chemical resistant clothing recommended.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid breathing dust; wear an approved respirator. Practice reasonable caution and personal cleanliness.
Avoid eye contact.

BICARBONATE OF SODA

UNUSUAL FIRE AND EXPLOSION PROCEDURES: If extremely large quantities are involved, significant levels of carbon dioxide may be generated making necessary the use of self-contained breathing apparatus. (Carbon dioxide is an asphyxiate at levels >5%). Soda ash, another decomposition product existing at temperatures >93°C, is a respiratory and skin irritant.

Section VII: REACTIVITY DATA

STABILITY Stable Unstable

STABILITY: At ambient temperatures and atmospheric pressure, tends to evolve carbon dioxide slowly and absorb moisture. At elevated temperatures carbon dioxide and water are evolved.

INCOMPATIBILITY (conditions to avoid): Moisture and Heat sensitive; decomposes weak acids releasing heat and forming salt, water and carbon dioxide.

HAZARDOUS DECOMPOSITION PRODUCTS: When temperature >190 °C, carbon dioxide gas will be released to the atmosphere. The resulting dust may be irritation to the eyes, skin and respiratory tract.

HAZARDOUS POLYMERIZATION:
Will not occur May Occur

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Suggest NIOSH/MESA approved dust mask
VENTILATION: 10 changes per hour suggested
PROTECTIVE GLOVES: Suggest plastic or rubber
EYE PROTECTION: Suggest goggles with side shields
OTHER PROTECTIVE EQUIPMENT (specify): Chemical resistant boots. Maintain a sink, safety shower, eyewash fountain in work area. Have oxygen readily available.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Material is generally regarded as safe for humans and animals. Store in a cool, dry place in tightly closed containers away from acids. Long-term storage may result in caking.

BICARBONATE OF SODA

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

To the extent possible, clean up spillage using shovels. Scoop up loose material and place it in appropriate containers. If spilled on the ground, the affected area should be scraped clean and the material placed in an appropriate container for disposal. Wear appropriate protective clothing and equipment during cleanup activities.

WASTE DISPOSAL METHOD

Dispose of in accordance with local, provincial, and federal regulations. Containers should NOT be reused. Containers should be disposed

Section IX: PREPARATION

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

DATE ISSUED: December 1, 1993

BY: Product Safety Committee

DATE UPDATED: April 1, 2002



MATERIAL SAFETY DATA SHEET

#1700, 407 - 2nd Street S.W., Calgary, Alberta T2P 2Y3
Telephone: (403) 269-2242 Fax: (403) 269-2251

Section I: IDENTIFICATION OF PRODUCT

Product Name: **CITRIC ACID**
Product Use: Oil Well Fluid & Cement Additive
Chemical Family: Organic Acid

WHMIS CLASSIFICATION: D-2(B)
WORK PLACE HAZARD: Skin & Eye Irritant
SHIPPING NAME: Not Regulated Under TDG
TDG CLASSIFICATION: Not Applicable
PACKAGE GROUP: Not Applicable
PIN: Not Applicable

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	LD(50)	OSHA PEL	ACGIH TLV
Citric Acid	100	77-92-9	6730 mg/kg	Not Available	Not Available

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN EYE CONTACT INHALATION INGESTION

CHRONIC EXPOSURE: None toxic, non volatile, non hazardous nuisance dust symptoms, low risk allergen.
EYE CONTACT: May cause eye irritation.
SKIN CONTACT: May cause irritation.
INGESTION: Irritation of mucous membranes. May cause gastrointestinal irritation..
INHALATION: Remove to fresh air. Give artificial respiration if necessary. Call physician..

Section IV: FIRST AID MEASURES

SKIN CONTACT: Immediately flush with water for 15 minutes. Remove contaminated clothing. If irritation persists seek medical attention.
EYE CONTACT: Immediately flush eye with water for 15 minutes. Call physician.
INGESTION: Give large quantities of water or milk. Call physician.
INHALATION: Remove to fresh air. Give artificial respiration if necessary. Call physician.

CITRIC ACID

Section V: PHYSICAL DATA

APPEARANCE AND ODOUR: Solid white crystals; odourless
SPECIFIC GRAVITY: 1.665 g/cc
BOILING POINT (°C): Not Applicable
MELTING POINT (°C): 153 °C
SOLUBILITY IN WATER: 60% @ 20 °C pH: 0.1N Solution = 2.2
PERCENT VOLATILE BY VOLUME: Not Applicable EVAPORATION RATE: Not Applicable
VAPOUR PRESSURES (mm Hg): Not Applicable VAPOUR DENSITY (Air = 1): Not Applicable

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT: Not Flammable
FLAMMABLE LIMITS: Not Applicable
EXTINGUISHING MEDIA: Not Applicable.
SPECIAL FIRE FIGHTING PROCEDURES: Self-contained respirators required for fire fighting personnel.
UNUSUAL FIRE AND EXPLOSION PROCEDURES: Not Available.

Section VII: REACTIVITY DATA

STABILITY Stable Unstable
INCOMPATIBILITY (conditions to avoid): Avoid Alkali metals, organic acids, oxides of sulphur, strong bases.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide
HAZARDOUS POLYMERIZATION: Will not occur May Occur

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Suggest NIOSH/MESA approved dust mask.
VENTILATION: Ventilate adequately.
PROTECTIVE GLOVES: Suggest plastic or rubber.
EYE PROTECTION: Suggest goggles.
OTHER PROTECTIVE EQUIPMENT (specify): As necessary to prevent contact with skin. Make eye wash station available.



CITRIC ACID

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid all skin contact. Keep containers closed when not in use. Store in cool well ventilated area.

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

Contain the spill. Pick up solids and place in a tightly sealed container.

WASTE DISPOSAL METHOD

In accordance with municipal, provincial and federal regulation.

Section IX: PREPARATION

THE INFORMATION CONTAINED HEREIN IS GIVEN IN GOOD FAITH, BUT NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE.

DATE ISSUED: January 27, 1994

BY: Product Safety Committee

DATE REVISED: January 15, 1995

VENDOR NUMBER: 18850

DATE UPDATED: October 1, 1999



MATERIAL SAFETY DATA SHEET

#1700, 407 - 2nd Street S.W., Calgary, Alberta T2P 2Y3
Telephone: (403) 269-2242 Fax: (403) 269-2251

Section I: IDENTIFICATION OF PRODUCT

Product Name: **2-ETHYLHEXYL ALCOHOL**
Product Use: Defoamer
Chemical Family: Alcohol

WHMIS CLASSIFICATION: B.3 D.2B

TDG CLASSIFICATION: Not Regulated

PACKAGE GROUP: III

WORK PLACE HAZARD: Combustible Liquid

PIN: N.A.

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number
2-ethylhexanol	100	104-76-7

Causes skin and eye irritation at elevated temperatures, vapour may cause irritation of eyes and respiratory tract.

Combustible liquid and vapour.

HMIS Hazard Ratings: Health: 2
Flammability: 2
Chemical Reactivity: 0
Flammability: 2
Chemical Reactivity: 0

NFPA Hazard Ratings: Health 2

Note: HMIS and NFPA ratings involve data and interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN EYE CONTACT INHALATION INGESTION

EFFECTS OF EXPOSURE:

INHALATION: At elevated temperatures, vapour may be irritating.
EYES: Causes irritation. At elevated temperatures, vapour may be irritating.
SKIN: Causes irritation.
INGESTION: May cause irritation of the gastrointestinal tract.

2-ETHYLHEXYL ALCOHOL

ACUTE TOXICITY DATA:

ORAL LD50 (RAT): 2.0-5.0 g/kg ORAL LD50 (MOUSE): 2.0 - 3.8 g/kg
ORAL LD50 (GUINEA PIG): 1.9 g/kg
INHALATION LC50 (RAT): >227 ppm/6 hrs. (highest concentration tested)
INHALATION LC50 (MOUSE): >227 ppm/6 hrs. (highest concentration tested)
INHALATION LC50 (GUINEA PIG): >227 ppm/6 rs. (highest concentration tested)
DERMAL LD50 (RABBIT): >2.0 g/kg DERMAL LD50 (GUINEA PIG): > 8.3 g/kg
SKIN IRRITATION (RABBIT): Slight to moderate
SKIN IRRITATION (GUINEA PIG): Moderate
SKIN IRRITATION (HUMAN): None (4% in petrolatum)
SKIN SENSITIZATION (HUMAN): None (4% petrolatum)
EYE IRRITATION (RABBIT): Moderate to strong

SUBCHRONIC TOXICITY DATA:

Oral study (9 doses, male mouse): LOEL = 1000 mg/kg/day (decrease in weight: testes); NOEL = 330 mg/kg/day

Oral study (9 doses, female mouse): LOEL - 1500 mg/kg/day (increase in weight: stomach); NOEL = 1000 mg/kg/day

Oral study (9 doses, male rat): LOEL = 330 mg/kg/day (increase in weight: testes, liver, kidney); NOEL = 100 mg/kg/day

Oral study (9 doses, female rat): LOEL = 1000 mg/kg/day (target organ effects: blood) (increase in weight: liver kidney, stomach) (decrease in weight: spleen); NOEL = 330 mg/kg/day

Oral study (90 doses, male rat): LOEL = 250 mg/kg/day (target organ effects: liver) NOEL = 125 mg/kg/day

Oral study (90 doses, male mouse): LOEL = 250 mg/kg/day (increase in weight: stomach); NOEL = 125 mg/kg/day

Dermal study (9 doses, rat): NOAEL = 0.5 ml/kg/day (skin irritation); NOEL = not established

Dermal study (12 doses, rat): LOEL = 1.67 g (target organ effects: liver); NOEL = not established

DEVELOPMENTAL TOXICITY DATA:

Dermal study (rat); NOAEL for maternal toxicity = 0.3 mg/kg/day (skin irritation); NOEL for developmental toxicity = 3.0 mg/kg/day (highest dose tested)

Inhalation study (850 mg/m³, 19 days, rat): LOEL for maternal toxicity = 850 mg/m³ (reduced feed intake) (only dose tested); NOEL for maternal toxicity = not established; NOEL for developmental toxicity = 850 mg/m³



2-ETHYLHEXYL ALCOHOL

Continued...

Oral study (rat): NOAEL for maternal toxicity = 650 mg/kg/day;
LOEL for embryo/fetotoxicity = 650 mg/kg/day; NOEL for developmental toxicity = 130 mg/kg/day

Oral study (mouse): NOEL for maternal toxicity = 191 mg/kg/day (highest dose tested); NOEL for developmental toxicity = 191 mg/kg/day

Dermal absorption rate (rat, in vitro): 150-350 microgram (s)/cm²/hr.

Dermal absorption rate (human, in vitro): 20-55 microgram (s)/cm²/hr.

Mutagenicity/Genotoxicity Data: Salmonella typhimurium assay (Ames test): negative (+/- activation)

Section IV: FIRST AID MEASURES

INHALATION: Move to fresh air. Treat symptomatically. Get medical attention if symptoms persist.
EYE CONTACT: Immediately flush with plenty of water for at least 15 minute. If easy to do, remove contact lenses. Get medical attention. In case of irritation from airborne exposure, move to fresh air. Get medical attention if symptoms persist..
SKIN CONTACT: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.
INGESTION: Seek medical advice.

Section V: PHYSICAL DATA

PHYSICAL FORM: Liquid
APPEARANCE AND ODOUR: Colourless and Musty
ODOUR THRESHOLD: 0.07 ppm
SPECIFIC GRAVITY @ 20°C (68°F): (Water=1): 0.833
VAPOUR DENSITY (Air = 1): 4.5
MELTING POINT (°C): -76°C - -70°C (-105 - -94°F)
BOILING POINT (°C): 184°C - (363° F)
VISCOSITY: Not Available
pH @ 1.0%: Not Available
SOLUBILITY IN WATER @ 20°C(68°F): 0.1%
PERCENT VOLATILE BY VOLUME: Not Available
EVAPORATION RATE (n-butyl acetate=1): 0.01
VAPOUR PRESSURES (mm Hg) @ 20°C (68°F): 0.15 mbar
OCTANOL/WATER PARTITION COEFFICIENT: Log P = 3.1, P = 1260

2-ETHYLHEXYL ALCOHOL

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT (tag closed cup): 73.3°C (164°F)
LEL @ 104°C (219°F): 0.88 volume %
UEL @ 133 °C (271 °F): 9.7 volume %
SENSITIVITY TO MECHANICAL IMPACT: Not available
SENSITIVITY TO STATIC DISCHARGE: Material is unlikely to accumulate a static charge which could act as an ignition source.
HAZARDOUS COMBUSTION PRODUCTS: Carbon dioxide, carbon dioxide
FLAMMABLE LIMITS: Not Applicable
EXTINGUISHING MEDIA: Water spray, dry chemical, carbon dioxide (CO₂), foam
AUTO-IGNITION TEMPERATURE (ASTM D2155): 288 C (550°F)
SPECIAL FIRE FIGHTING PROCEDURES: Wear self contained breathing apparatus and protective clothing. Use water with caution. Since this material is lighter than water and relatively insoluble, the fire could easily be spread by the use of water in an area where the water could not be contained. Use water spray to keep fire exposed containers cool.
UNUSUAL FIRE AND EXPLOSION PROCEDURES: Classified as combustible

Section VII: REACTIVITY DATA

STABILITY Stable Unstable
INCOMPATIBILITY (conditions to avoid): Material can react with strong oxidizing agents.
HAZARDOUS POLYMERIZATION: Will not occur May Occur

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

EXPOSURE LIMITS:
ACGIH Threshold Limit Value (TLV): Not established
OSHA (USA) Permissible Exposure Limit (PEL, 1989 Z-1-A values or section specific standards): Not established
VENTILATION: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. Supplementary local exhaust ventilation, closed systems, or respiratory protection may be needed in special circumstances such as poorly ventilated spaces, evaporation from large surfaces, spraying, heating, etc.
RESPIRATORY PROTECTION: If engineering controls do not maintain airborne concentrations to an acceptable level, an approved respirator must be worn.
RESPIRATOR TYPE: Organic vapour
EYE PROTECTION: Wear safety glasses with side shields (or goggles).

2-ETHYLHEXYL ALCOHOL

PROTECTION INFORMATION CONTINUED

SKIN PROTECTION: Wear chemical resistant gloves and protective clothing appropriate for the risk of exposure. Contact glove manufacturer for specific information.

RECOMMENDED DECONTAMINATION FACILITIES: Eye wash, washing facilities, safety shower.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

PERSONAL PRECAUTIONARY MEASURES: Avoid contact with eyes, skin and clothing. Avoid breathing vapour from heated material. Use only with adequate ventilation. Wash thoroughly after handling.

PREVENTION OF FIRE AND EXPLOSION: Keep away from heat and flame. Keep from contact with oxidizing materials.

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

Eliminate all ignition sources. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste.

WASTE DISPOSAL METHOD

Discharge, treatment, or disposal may be subject to federal, provincial, or municipal laws. Incinerate.

Since emptied containers retain product residue, follow label warnings even after container is emptied.

Section IX: PREPARATION

This document has been prepared in accordance with the MSDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

OSHA hazardous chemical: 2-ethylhexanol

This document has been prepared in accordance with the MSDS requirements of the WHMIS controlled products Regulation.

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

DATE ISSUED: May 9, 1996

BY: Product Safety Committee

DATE UPDATED: April 1, 2002

Section I: IDENTIFICATION OF PRODUCT

Product Name: **POTASSIUM CHLORIDE**
Product Use: Drilling Mud Additive
Chemical Family: Muriate of Potash

WHMIS CLASSIFICATION: Not a controlled product under WHMIS

TDG CLASSIFICATION: Not Dangerous Goods

PACKAGE GROUP: Not Applicable
PIN: Not Applicable

WORK PLACE HAZARD: Not Applicable

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	LD(50)	LC(50)
Potassium Chloride	95 - 99.9	7447-40-7	2400 mg/kg	Not Determined
Sodium Chloride	0 - 5	7647-14-15	Not Determined	Not Determined

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN EYE CONTACT INHALATION INGESTION

SKIN CONTACT: None currently known

EYE CONTACT: Dust may irritate the eyes

INHALATION: Dust may be irritating

INGESTION: Negligible risk

CHRONIC EFFECTS OF EXPOSURE: No specific information available.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None reported

Section IV: FIRST AID MEASURES

EYE CONTACT: Flush with water
SKIN CONTACT: Wash with running water.
INHALATION: Remove from exposure
INGESTION: Give plenty of water. Do not induce vomiting. Call physician.

Section V: PHYSICAL DATA

APPEARANCE AND ODOUR: White crystals; odourless
SPECIFIC GRAVITY: 1.988
BOILING POINT (°C): 1500°C
MELTING POINT (°C): 772°C
SOLUBILITY IN WATER: 276 g/litre @ 0°C
pH: 8 - 9
PERCENT VOLATILE BY VOLUME: Not Applicable
EVAPORATION RATE: Not Applicable
VAPOUR PRESSURES (mm Hg): Not Applicable
VAPOUR DENSITY (Air = 1): Not Applicable

POTASSIUM CHLORIDE

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT: Not Applicable
FLAMMABLE LIMITS: Not Applicable
EXTINGUISHING MEDIA: Not a combustible material
SPECIAL FIRE FIGHTING PROCEDURES: None
UNUSUAL FIRE AND EXPLOSION PROCEDURES: None

Section VII: REACTIVITY DATA

STABILITY Stable Unstable

INCOMPATIBILITY (conditions to avoid): None
HAZARDOUS DECOMPOSITION PRODUCTS: None
HAZARDOUS POLYMERIZATION: Will not occur May Occur

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: NOISH approved respirator
VENTILATION: Local mechanical 10 changes per hour
PROTECTIVE GLOVES: Suggest plastic or rubber
EYE PROTECTION: Suggest goggles
OTHER PROTECTIVE EQUIPMENT (specify): Normal work clothes.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Store in a cool, dry, well-ventilated place away from incompatible materials. Keep bags or fibre drums dry at all times. Wash thoroughly after handling. Do not get in eyes, on skin, or on clothings

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

For small spills, sweep up and dispose of in DOT-approved containers. For large spills, shovel into DOT-approved waste containers. Keep out of sewers, storm drains, surface waters and soils.

WASTE DISPOSAL METHOD

Dispose of contaminated product and materials used in cleaning up spills and leaks in a manner approved for this material. Consult appropriate federal, provincial and local regulatory agencies to ascertain proper disposal procedures.

Section IX: PREPARATION

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

DATE ISSUED: December 1, 1993 BY: Product Safety Committee
DATE UPDATED: October 1, 1999

Section I: IDENTIFICATION OF PRODUCT

Product Name: **POTASSIUM HYDROXIDE 90% KOH (FLAKE)**
Product Use: Oil Well Cement & Fluid Additive
Chemical Family: Inorganic Alkali

WHMIS CLASSIFICATION:
Class E and D-1(B)
WORK PLACE HAZARD: Corrosive and
poisonous

SHIPPING NAME: Potassium hydroxide, solid
TDG CLASSIFICATION: Class 8 (9.2)
PACKAGE GROUP: II
PIN: UN1813

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	LD(50) Oral-Rat
Potassium Hydroxide	90	1310-58-3	365 mg/kg

TOXICOLOGY DATA: Regardless of concentration, the severity of damage and extent of its irreversibility increases with length of contact time. Prolonged contact with even dilute potassium hydroxide solution (\Rightarrow 2.0%) can cause a high degree of tissue destruction. The latent period following skin contact during which no sensation occurs also varies with concentration.

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN EYE CONTACT INHALATION INGESTION

SKIN CONTACT: May cause severe burns.

EYE CONTACT: May cause severe irritation with corneal injury and result in permanent impairment of vision, even blindness.

INHALATION: May cause irritation of mucous membranes of the nose and throat

INGESTION: May cause severe burns of mouth, throat and gastrointestinal tissues.

EFFECTS OF OVEREXPOSURE: Corrosive to all body tissues with which it comes in contact. The effect of local exposure may consist of multiple areas of superficial destruction of the skin or of primary irritant dermatitis. Similarly, inhalation of dust, spray, or mist may result in varying degrees of irritation or damage of the respiratory tract tissues and an increased susceptibility to respiratory illness. These effects occur only when the TLV is exceeded.

Section IV: FIRST AID MEASURES

SKIN CONTACT: Wash exposed portion of skin with water (and soap). Remove contaminated clothing and shoes. Do not reuse until cleaned. Seek medical attention immediately.

EYE CONTACT: OBJECT IS TO FLUSH MATERIAL OUT IMMEDIATELY THEN SEEK MEDICAL ATTENTION. Water is the only accepted method of removal. Flush eyes with large amount of water for 15 minutes while holding eyelids open. Seek medical attention. Washing eyes within several seconds is essential to achieve maximum effectiveness.

INHALATION: If affected, remove person to fresh air immediately. If breathing has stopped, apply artificial respiration and administer oxygen if necessary. Seek medical attention.

INGESTION: Do not give liquids if person is unconscious or very drowsy. Otherwise give no more than 2 glasses of milk or water and SEEK IMMEDIATE MEDICAL ATTENTION. If vomiting occurs spontaneously, keep airway clear.

POTASSIUM HYDROXIDE

Section V: PHYSICAL DATA

APPEARANCE AND ODOUR:	White Flake; Odourless		
SPECIFIC GRAVITY:	2.044 @ 20°C		
BOILING POINT (°C):	1320°C	MELTING POINT (°C):	400°C
SOLUBILITY IN WATER:	Completely soluble	pH: 0.01 m/l = 12.0	
PERCENT VOLATILE BY VOLUME:	Not Applicable	EVAPORATION RATE:	Not Applicable
VAPOUR PRESSURES (mm Hg):	60 mm/Hg @ 1313°C	VAPOUR DENSITY (Air = 1):	Not Available

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT:	Not combustible
FLAMMABLE LIMITS:	Not combustible
EXTINGUISHING MEDIA:	Not flammable, Not applicable
SPECIAL FIRE FIGHTING PROCEDURES:	Use media proper to primary cause of fire
UNUSUAL FIRE AND EXPLOSION PROCEDURES:	Not Applicable

Section VII: REACTIVITY DATA

STABILITY	Stable <input checked="" type="checkbox"/>	Unstable <input type="checkbox"/>
INCOMPATIBILITY (conditions to avoid):	Contact with aluminum, strong acids.	
HAZARDOUS DECOMPOSITION PRODUCTS:	None	
HAZARDOUS POLYMERIZATION:	Will not occur <input checked="" type="checkbox"/>	May Occur <input type="checkbox"/>

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:	NIOSH/MSHA approved respirator where dust, mist, or spray may be generated
VENTILATION:	Local exhaust for dust, mist control
PROTECTIVE GLOVES:	Impervious Gloves
EYE PROTECTION:	Goggles plus full face shield
OTHER PROTECTIVE EQUIPMENT (specify):	Impervious work clothing covering arms and legs, rubber boots & apron. Emergency shower and eyewash facility should be in close proximity.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep in a closed, labeled container in ventilated area. Wash before eating, drinking using tobacco products or rest rooms. Do not breath dust.

NOTE Minimum contact with this and all chemicals is recommended as a good, general policy to follow.

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

ALWAYS SAFETY CLOTHING AND EQUIPMENT. Leaks should be stopped. Spills should be contained and cleaned up immediately and removed to chemical waste area. Spills should be shoveled up or removed by using a vacuum truck (if Liquid). Neutralize remaining traces of material with any dilute inorganic acid such as hydrochloric, sulfuric, nitric, phosphoric, and acetic acid. The spilled should the be flushed with water followed by liberal covering of sodium bicarbonate. All clean-up material should be removed and placed in approved containers, labeled and stored in a safe place to await proper treatment or disposal. Spills or releases should be to the appropriate local, provincial, and federal agencies.

WASTE DISPOSAL METHOD

Dissolve slowly in water; carefully neutralize with dilute acid and discharge to chemical waste treatment. Consult federal or local authorities for proper disposal procedure.

Section IX: PREPARATION

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

DATE:	July 31, 1996	BY:	Product Safety Committee
SUPERSEDES:	December 30, 1993	VENDOR NUMBER:	18850
UPDATED:	October 1, 1999		



MATERIAL SAFETY DATA SHEET

#1700, 407 - 2nd Street S.W., Calgary, Alberta T2P 2Y3
Telephone: (403) 269-2242 Fax: (403) 269-2251

Section I: IDENTIFICATION OF PRODUCT

Product Name: **PRIMA-SEAL (FINE, MEDIUM, COARSE)**
Product Use: Drilling Mud Additive
Chemical Family: Blend of vegetable and polymer fibres

WHMIS CLASSIFICATION: Not a Controlled Product Under WHMIS
TDG CLASSIFICATION: Not Dangerous Goods
PACKAGE GROUP: Not Applicable
PIN: Not Applicable
WORK PLACE HAZARD: Not Applicable

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	LD(50)	LC(50)
No Hazardous Ingredients				

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN EYE CONTACT INHALATION INGESTION

EFFECTS OF OVEREXPOSURE: None

Section IV: FIRST AID MEASURES

EMERGENCY FIRST AID MEASURES: Treat as Nuisance Dust

Section V: PHYSICAL DATA

APPEARANCE AND ODOUR:	Yellow/brown particles; slight odour
SPECIFIC GRAVITY:	Not Available
BOILING POINT (°C):	Not Applicable
MELTING POINT (°C):	Not Applicable
SOLUBILITY IN WATER:	Cedar fibres and walnuts absorb some water:
PERCENT VOLATILE BY VOLUME:	Not Volatile
EVAPORATION RATE:	Not Applicable
VAPOUR PRESSURES (mm Hg):	Not Applicable
VAPOUR DENSITY (Air = 1):	Not Applicable

PRIMA-SEAL

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT: Not Applicable

FLAMMABLE LIMITS: Not Applicable

EXTINGUISHING MEDIA: Water spray, dry chemical, foam

SPECIAL FIRE FIGHTING PROCEDURES: Self-contained respirators required for fire fighting personnel.

UNUSUAL FIRE AND EXPLOSION PROCEDURES: Can be combustible in a finely divided and suspended state.

Section VII: REACTIVITY DATA

STABILITY

Stable

Unstable

INCOMPATIBILITY (conditions to avoid): None

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS POLYMERIZATION:

Will not occur

May Occur

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Suggest NIOSH/MESA approved dust mask

VENTILATION: 10 changes per hour suggested

PROTECTIVE GLOVES: None Required

EYE PROTECTION: None Required

OTHER PROTECTIVE EQUIPMENT (specify): None Required

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid ingestion. Practice reasonable caution and personal cleanliness. Avoid skin and eye contact.

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

Vacuum or sweep-up if dry. If wet, pick up with dry material such as sand or dirt. Avoid flushing with water as material may become extremely slippery.

WASTE DISPOSAL METHOD

Dispose of material in accordance with local ordinances. Landfill is suggested.

Section IX: PREPARATION

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

DATE ISSUED: December 1, 1993

BY: Product Safety Committee

DATE UPDATED: April 1, 2002



MATERIAL SAFETY DATA SHEET

#1700, 407 - 2nd Street S.W., Calgary, Alberta T2P 2Y3
Telephone: (403) 269-2242 Fax: (403) 269-2251

Section I: IDENTIFICATION OF PRODUCT

Product Name: **SODA ASH**
Product Use: Drilling Mud Additive
Chemical Family: Sodium Carbonate, Anhydrous

WHMIS CLASSIFICATION:
D-2B
WORK PLACE HAZARD:
Skin and Eye Irritant

TDG CLASSIFICATION: Not Regulated
PACKAGE GROUP: Not Regulated
PIN: Not Regulated

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	LD(50)	LC(50)
Sodium Carbonate	>99	(497-19-8)	4 g/kg	Not determined

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN EYE CONTACT INHALATION INGESTION

SKIN CONTACT: May cause skin irritation from prolonged contact, especially in hot weather.

EYE CONTACT: May irritate or burn eyes.

INHALATION: Inhalation of product may irritate nose throat and lungs.

INGESTION: Although low in toxicity, ingestion can be harmful. May cause nausea, vomiting, stomach ache and diarrhea.

ACUTE TOXICITY: Moderately toxic LD₅₀ (rat): 2800 mg/kg

Section IV: FIRST AID MEASURES

EYE CONTACT: Immediately flush eyes with lots of running water for 15 minutes, lifting the upper and lower eyelids occasionally. GET IMMEDIATE MEDICAL ATTENTION.

SKIN CONTACT: Immediately wash skin with lots of soap and water. Remove contaminated clothing and shoes; wash before reuse. Get medical attention if irritation persists after washing.

INHALATION: Remove to fresh air. Give artificial respiration if not breathing. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION: DO NOT INDUCE VOMITING. If conscious, give lots of water or milk. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

SODA ASH

Section V: PHYSICAL DATA

APPEARANCE AND ODOUR: Odourless, white powder or granular solid or crystal.
SPECIFIC GRAVITY: 2.533
BOILING POINT (°C): N/A
MELTING POINT (°C): 851.111
SOLUBILITY IN WATER: 30%
pH: 10.5 (5% solution)
PERCENT VOLATILE BY VOLUME: Not Applicable
EVAPORATION RATE: Not Applicable
VAPOUR PRESSURES (mm Hg): Not Applicable
VAPOUR DENSITY (Air = 1): Not Applicable

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT: Not Applicable
FLAMMABLE LIMITS: Not Applicable
EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire.
SPECIAL FIRE FIGHTING PROCEDURES: Self-contained respirators required for fire fighting personnel.
UNUSUAL FIRE AND EXPLOSION PROCEDURES: Extinguish nearby sources of ignition.

Section VII: REACTIVITY DATA

STABILITY Stable Unstable

INCOMPATIBILITY (conditions to avoid): Contact with acids will release carbon dioxide gas. Can react violently with red hot aluminum metal; fluorine gas; lithium; and 2, 4, 6 trinitrotoluene.
HAZARDOUS DECOMPOSITION PRODUCTS: Heating soda ash liberates CO₂. When dissolving, add to water cautiously and with stirring; solutions can get hot.
HAZARDOUS POLYMERIZATION: Will not occur May Occur

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Suggest NIOSH/MESA approved dust mask
VENTILATION: Local mechanical
PROTECTIVE GLOVES: Suggest plastic or rubber
EYE PROTECTION: Suggest goggles
OTHER PROTECTIVE EQUIPMENT (specify): As a minimum, wear long-sleeved shirt, and trousers.



SODA ASH

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid contact with eyes or prolonged skin contact. Avoid breathing dust. Use good personal hygiene and housekeeping.

Store in a cool, dry, well-ventilated place away from acids. Prolonged storage may cause product to cake and become wet from atmospheric moisture. ALWAYS OBEY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL.

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

Wear appropriate safety gear. Shovel up dry chemical and place into an empty container with cover. Cautiously spray residue with plenty of water. Keep contaminated water from entering sewers and water courses.

WASTE DISPOSAL METHOD

Consistent with the requirements of local waste disposal authorities. If permitted by applicable disposal regulations, bury in a solid waste landfill or dissolve and neutralize as follows: Dissolve in water using caution as solution can get hot. Neutralize with acid and flush to sewer with plenty of water. Good ventilation is required during neutralization due to release of CO₂ gas. Neutralized wastes may have to be disposed of by an approved contractor.

Section IX: PREPARATION

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

DATE ISSUED: December 1, 1993

BY: Product Safety Committee

DATE UPDATED: April 1, 2002



MATERIAL SAFETY DATA SHEET

#1700, 407 - 2nd Street S.W., Calgary, Alberta T2P 2Y3
Telephone: (403) 269-2242 Fax: (403) 269-2251

Section I: IDENTIFICATION OF PRODUCT

Product Name: **SOYA LECITHIN TSS (Non-Edible)**

Chemical Name: Soybean Lecithin

WHMIS CLASSIFICATION: Not controlled

TDG CLASSIFICATION: Not controlled
PACKAGING GROUP: N/A
PIN: N/A

WORKPLACE HAZARD: N/A

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	LD ₅₀	LC ₅₀	Exposure Limits
No hazardous ingredients					

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN EYE CONTACT INHALATION INGESTION

Acute Effects:

EYE CONTACT: Eye contact may cause slight irritation.

SKIN CONTACT: No special irritation known.

INHALATION: Extremely low volatility makes inhalation exposure unlikely.

Note: Medical Conditions Aggravated by Exposure: Soybean derived product. Avoid if sensitive to soy products.

Section IV: FIRST AID MEASURES

SKIN CONTACT: No known effect on skin contact, rinse with water for a few minutes. If irritation develops or persists, seek medical attention.

EYE CONTACT: Flush eyes with clean water for at least 15 minutes. If irritation develops or persists, seek medical attention.

INHALATION: No known effect. Allow victims to rest in a well ventilated area. If irritation develops or persists, seek medical attention.

INGESTION: In all cases of doubt, or when symptoms persist, seek medical attention.

SOYA LECITHIN TTS

Section V: PHYSICAL DATA

PHYSICAL STATE:	Viscous fluid liquid
APPEARANCE AND ODOUR:	Bland, Brownish-yellow in color.
SPECIFIC GRAVITY:	1.05 (water = 1)
BOILING POINT (°C):	Not available
VAPOUR PRESSURE (mmHG):	Not available
SOLUBILITY IN WATER:	Insoluble
pH:	Not available
VAPOUR DENSITY (Air = 1):	Not available
ODOUR THRESHOLD:	Not available
EVAPORATION RATE:	Not available

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT:	Not available
LEL, UEL:	Not available
FLAMMABILITY:	No specific information is available regarding the flammability of this product in the presence of various materials.
FIRE EXTINGUISHING MEDIA:	Carbon dioxide, dry chemical or foam.
FIRE AND EXPLOSION HAZARDS:	No specific information is available regarding the product's risks of explosion in the presence of various materials.

*Keep away from excessive heat or open flame.

This product may be combustible at high temperatures.

Section VII: REACTIVITY DATA

STABILITY	Stable <input checked="" type="checkbox"/>	Unstable <input type="checkbox"/>
INCOMPATIBILITY (conditions to avoid):	Strong oxidizing materials can cause a reaction	
HAZARDOUS DECOMPOSITION PRODUCTS:	No specific information available for the degradation of this product.	
HAZARDOUS POLYMERIZATION:	Will not occur <input checked="" type="checkbox"/>	May Occur <input type="checkbox"/>

Section VIII: PREVENTIVE MEASURE

RESPIRATORY PROTECTION:	Self-contained breathing apparatus (NIOSH/MSHA or equivalent). Respiratory protection is not usually required under normal condition of use. Determine the appropriate type of equipment for specific application by consulting the respirator manufacturer. Observe the respirator use limitations specified by NIOSH/MSHA or the manufacturer.
EYE PROTECTION:	Safety glasses or goggles.
CLOTHING:	Full protective clothing, lab coat.

SOYA LECITHIN TTS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid contact with strong oxidizing agents. Keep away from excessive heat or open flame. To preserve product quality, keep in closed container. Avoid eye contact. Wear safety glasses or chemical goggles if eye contact is likely. Follow good manufacturing and handling practices.

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

Use absorbent material to collect and contain for disposal.

WASTE DISPOSAL METHOD

Disposal via incineration or in an approved sanitary landfill in accordance with state, provincial and/or federal regulations.

Protective clothing for large spills should include splash goggles, full suit, boots, and gloves. Suggested protecting clothing might not be sufficient, consult a specialist before handling this product. Be sure to use a MSHA/HIOSH approved respirator or equivalent.

Section IX: PREPARATION

DATE ISSUED: December 27, 2001

BY: Product Safety Committee

DATE UPDATED:



MATERIAL SAFETY DATA SHEET

#1700, 407 - 2nd Street S.W., Calgary, Alberta T2P 2Y3
Telephone: (403) 269-2242 Fax: (403) 269-2251

Section I: IDENTIFICATION OF PRODUCT

Product Name: **STARPAK DP**
Product Use: Oil Well Fluid Additive
Chemical Family: Corn Starch Ether

WHMIS CLASSIFICATION: Not a controlled product under WHMIS
WORK PLACE HAZARD: Not Applicable
SHIPPING NAME: Not Regulated under TDG

TDG CLASSIFICATION: Not Applicable
PACKAGE GROUP: Not Applicable
PIN: Not Applicable

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	LD(50)	OSHA PEL	ACGIH TLV
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No hazardous Ingredients.

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN EYE CONTACT INHALATION INGESTION

EYE CONTACT: May cause minor irritation to the eyes.
SKIN CONTACT: May cause some minor irritation due to dust drying skin.
INGESTION: May cause gastrointestinal tract irritation.
INHALATION: May be irritating to mucous membranes of nose, throat and upper respiratory tract.

Section IV: FIRST AID MEASURES

SKIN CONTACT: Wash affected area with soap and water.
EYE CONTACT: Flush eyes with water for 15 minutes and seek medical attention.
INGESTION: Dilute by drinking large quantities of water and seek medical attention.
INHALATION: Remove patient to fresh air.

STARPAK DP

Section V: PHYSICAL DATA

APPEARANCE AND ODOUR:	Solid white powder; starchy odour	
SPECIFIC GRAVITY:	Not Applicable	
BOILING POINT (°C):	Not Determined	
MELTING POINT (°C):	Not Determined	
SOLUBILITY IN WATER:	Complete	pH: 5.0 - 7.0 (4% solution)
PERCENT VOLATILE BY VOLUME:	Not Applicable	EVAPORATION RATE: Not Applicable
VAPOUR PRESSURES (mm Hg):	Not Applicable	BULK DENSITY: 30 - 40 (lbs/ft)

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT:	Not Applicable
FLAMMABLE LIMITS:	Not Applicable
EXTINGUISHING MEDIA:	Water; CO ₂ ; Dry foam or powder
SPECIAL FIRE FIGHTING PROCEDURES:	Self-contained respirators required for fire fighting personnel.
UNUSUAL FIRE AND EXPLOSION PROCEDURES:	Dust-air mixtures may be explosive. The minimum ignition temperatures for starch, through 200 mesh, is 380°C. The minimum explosive concentration of a dust cloud is 0.04 oz/ft. Avoid open lights, flames, welding and spark producing sources.

Section VII: REACTIVITY DATA

STABILITY	Stable <input checked="" type="checkbox"/>	Unstable <input type="checkbox"/>
INCOMPATIBILITY (conditions to avoid):	Damp or wet conditions will lead to spoilage.	
CONDITIONS OF REACTIVITY:	Strong oxidizing agents	
HAZARDOUS DECOMPOSITION PRODUCTS:	Oxides of carbon	
HAZARDOUS POLYMERIZATION:	Will not occur <input checked="" type="checkbox"/>	May Occur <input type="checkbox"/>

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:	Use an NIOSH approved dust filter.
VENTILATION:	Local exhaust ventilation is recommended for control of dust.
PROTECTIVE GLOVES:	Suggest plastic or rubber.
EYE PROTECTION:	Suggest the use of goggles when handling.
OTHER PROTECTIVE EQUIPMENT (specify):	None required. Avoid the creation of dust.



STARPAK DP

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid ingestion. Do not breath the dust. Wash thoroughly after handling. Practice reasonable caution and personal cleanliness. Launder exposed clothing before reuse. Avoid practices which produce dust. Store away from sources of ignition. Store in dry well ventilated place.

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

Use appropriate safety equipment. Avoid all bodily contact with spilled material. Small spills, sweep up and either recover to dispose in approved containers. Large spills, shovel and sweep up for reclamation or disposal. It is suggested that recovered material be reclaimed for reuse. Do not allow material to enter storm sewers or storm water inlets.

WASTE DISPOSAL METHOD

Dispose to conform with local disposal regulations. It is the responsibility of the user of this product to determine at the time of disposal whether the product meet criteria for hazardous waste. This product lends itself to recovering for reclamation if spilled.

Section IX: PREPARATION

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DATE ISSUED: April 12, 1995
DATE REVISED: January 15, 1996
DATE UPDATED: April 1, 2002

BY: Product Safety Committee
VENDOR NUMBER: 7200



MATERIAL SAFETY DATA SHEET

#1700, 407 - 2nd Street S.W., Calgary, Alberta T2P 2Y3
Telephone: (403) 269-2242 Fax: (403) 269-2251

Section I: IDENTIFICATION OF PRODUCT

Product Name: **STAFLO-EXLO**
Product Use: Drilling Mud Additive
Chemical Family: Sodium Carboxymethylcellulose

WHMIS CLASSIFICATION: Not a Controlled Product Under WHMIS
TDG CLASSIFICATION: Not Dangerous Goods
PACKAGE GROUP: Not Applicable
WORK PLACE HAZARD: Not Applicable
PIN: Not Applicable

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	LD(50)	LC(50)
No Hazardous Ingredients				

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN EYE CONTACT INHALATION INGESTION
THRESHOLD LIMIT VALUE: None
EFFECTS OF OVEREXPOSURE: Not Determined

Section IV: FIRST AID MEASURES

EMERGENCY AND FIRST AID PROCEDURES: Treat as Nuisance dust

Section V: PHYSICAL DATA

APPEARANCE AND ODOUR: Free flowing white powder; no appreciable
SPECIFIC GRAVITY: 1.55
BOILING POINT (°C): Not Applicable
MELTING POINT (°C): Not Applicable
SOLUBILITY IN WATER: Soluble
PERCENT VOLATILE BY VOLUME: Not Applicable
EVAPORATION RATE: Not Applicable
VAPOUR PRESSURES (mm Hg): Not Applicable
VAPOUR DENSITY (Air = 1): Not Applicable
pH @ 1.0%: 6-8 (at 10 g/l water)



MATERIAL SAFETY DATA SHEET

#1700, 407 - 2nd Street S.W., Calgary, Alberta T2P 2Y3
Telephone: (403) 269-2242 Fax: (403) 269-2251

Section I: IDENTIFICATION OF PRODUCT

Product Name: **XANVIS**
Product Use: Drilling Mud Additive
Chemical Family: Xanthan Gum (polysaccharide)

WHMIS CLASSIFICATION: Not a controlled product under WHMIS
TDG CLASSIFICATION: Not Dangerous Goods
WORK PLACE HAZARD: Not Applicable
PACKAGE GROUP: Not Applicable
PIN: Not Applicable

Section II: HAZARDOUS INGREDIENTS

Ingredient	Percent	CAS Number	LD(50)	LC(50)
No Hazardous Ingredients				

Section III: TOXICOLOGICAL PROPERTIES

Route of Entry: SKIN EYE CONTACT INHALATION INGESTION

INHALATION: Excessive inhalation of dust impedes respiration due to hygroscopic properties.

Section IV: FIRST AID MEASURES

EYE CONTACT: Flush with plenty of water. If irritation develops, call a physician
SKIN CONTACT: Ordinary measure of personal hygiene should be adequate.
INHALATION: Symptomatic treatment.
INGESTION: Essentially non-toxic.

Section V: PHYSICAL DATA

APPEARANCE AND ODOUR: Light beige powder, slight odour
SPECIFIC GRAVITY: 1.5
BOILING POINT (°C): Not Applicable
MELTING POINT (°C): Not Applicable
SOLUBILITY IN WATER: Complete
PERCENT VOLATILE BY VOLUME: 15% Maximum (H₂O)
EVAPORATION RATE: Not Applicable
VAPOUR PRESSURES (mm Hg): Not Applicable
VAPOUR DENSITY (Air = 1): Not Applicable
pH @ 1.0%: 5.4-8.6

XANVIS

Section VI: FIRE AND EXPLOSION DATA

FLASH POINT: Not Applicable
FLAMMABLE LIMITS: Not Applicable
EXTINGUISHING MEDIA: Dry chemical, foam, water fog, spray
SPECIAL FIRE FIGHTING PROCEDURES: Self-contained respirators required for fire fighting personnel.
UNUSUAL FIRE AND EXPLOSION PROCEDURES: Combustible dust in the finely divided and suspended state.

Section VII: REACTIVITY DATA

STABILITY

Stable

Unstable

INCOMPATIBILITY (conditions to avoid): Strong oxidizing agents and caustic solutions
HAZARDOUS DECOMPOSITION PRODUCTS: None
HAZARDOUS POLYMERIZATION:

Will not occur

May Occur

Section VIII: PREVENTIVE MEASURE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Suggest NIOSH/MESA approved dust mask.
VENTILATION: 10 changes per hour suggested
PROTECTIVE GLOVES: None Required
EYE PROTECTION: None Required
OTHER PROTECTIVE EQUIPMENT (specify): None Required

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Product becomes very slippery when wet. Wash thoroughly after handling. Keep container closed. Exercise caution in the storage and handling of all chemical substances. Use in ventilated area.

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

Sweep-up spilled material and repackage. Hose spill area very thoroughly. This product becomes very slippery when wet.

WASTE DISPOSAL METHOD

Dispose of material in accordance with local ordinances. Landfill is suggested.

Section IX: PREPARATION

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DATE ISSUED: December 1, 1993

BY: Product Safety Committee

DATE UPDATED: April 1, 2002