

**QULLIQ ENERGY CORPORATION**  
**SPILL CONTINGENCY PLAN**

**JAN 2018**



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# Introduction

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## **SCOPE AND PURPOSE**

The purpose of the Qulliq Energy Corporation (QEC) Spill Contingency Plan (SCP) is to provide an information base from which to respond to an oil spill (fuel oil or any product in chemical inventory) on land at the facility or on the water during the off-loading of fuel at sea-lift. It should be noted that diesel fuel (MSDS page 5) is transported to the plants either by pipeline or by a fuel transport truck with the exception of Clyde River and Sanikiluaq which use Jet A1 (MSDS page 17). All other solvents, fluids, etc. (indicated in the Material Safety Data Sheets) are transported either in 205L drums or smaller containers as indicated in the QEC chemical inventory. QEC operates and maintains 27 power plants in 25 communities in Nunavut. Each plant and community is unique but there are similarities among them that allow for similar procedures to be implemented with respect to this SCP.

- *This SCP fulfills the GN requirement of the Consolidation of Regulation R-068-93 Spill Contingency Planning and Reporting Regulations (Dated 22 July, 1993).*
- *This SCP also constitutes the emergency plan for our bulk fuel storage systems as required by Environment Canada as per section 30 of the Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations of June 2008. QEC and its bulk fuel systems are registered with Environment Canada under the following:*

Tank	Community	Orientation	Year	Type	Berm	EC-Reg#	Capacity (L)	Product
501-1	Cambridge Bay	Vertical	1988	Single Wall	Steel	EC-00000169	443,037	Diesel
501-2	Cambridge Bay	Vertical	1988	Single Wall	Steel	EC-00000169	321,477	Diesel
501-3	Cambridge Bay	Vertical	1988	Single Wall	Steel	EC-00000169	321,477	Diesel
501-4	Cambridge Bay	Vertical	1976	Single Wall	Steel	EC-00000169	956,828	Diesel
501-5	Cambridge Bay	Vertical	1992	Single Wall	Steel	EC-00000169	943,898	Diesel
501-6 Day	Cambridge Bay	Horizontal	1992	Single Wall		EC-00000170	2,280	Diesel
502-1	Gjoa Haven	Horizontal	1976	Single Wall	Steel	EC-00000167	102,508	Diesel
502-2 Day	Gjoa Haven	Vertical	1972	Single Wall		EC-00000167	1,135	Diesel
503-1	Taloyoak	Horizontal	1987	Single Wall	Steel	EC-00000170	94,522	Diesel
503-2 Day	Taloyoak	Vertical	1987	Single Wall		EC-00000170	1,135	Diesel
504-1	Kugaaruk	Vertical	1988	Single Wall	Steel	EC-00000171	80,604	Diesel
504-2 Day	Kugaaruk	Vertical	1988	Single Wall		EC-00000171	1,135	Diesel
505-1	Kugluktuk	Vertical	1991	Single Wall	Steel	EC-00000172	800,691	Diesel
505-2	Kugluktuk	Vertical	1991	Single Wall	Steel	EC-00000172	800,691	Diesel
505-3 Day	Kugluktuk	Vertical	1991	Single Wall		EC-00000172	1,135	Diesel
505-4 Day	Kugluktuk	Vertical	1991	Single Wall		EC-00000172	1,136	Diesel
601-1	Rankin Inlet	Vertical	1990	Single Wall	Steel	EC-00000175	1,612,535	Diesel
601-2	Rankin Inlet	Vertical	1991	Single Wall	Steel	EC-00000175	2,429,035	Diesel
601-3 Day	Rankin Inlet	Vertical	1992	Single Wall		EC-00000175	1,135	Diesel
601-4 Day	Rankin Inlet	Vertical	1993	Single Wall		EC-00000175	1,135	Diesel
602-1	Baker Lake	Horizontal	2006	Double	Steel	EC-00000176	90,000	Diesel
602-2	Baker Lake	Horizontal	2006	Double	Steel	EC-00000176	90,000	Diesel
602-3	Baker Lake	Horizontal	2006	Single Wall		EC-00000176	1,135	Diesel
602-4	Baker Lake	Horizontal	2006	Single Wall		EC-00000176	1,135	Diesel
603-1	Arviat	Horizontal	1998	Single Wall	Steel	EC-00000179	90,000	Diesel
603-2	Arviat	Horizontal	1998	Single Wall	Steel	EC-00000179	90,000	Diesel
603-3	Arviat	Vertical	1995	Single Wall	Steel	EC-00000179	986,335	Diesel
603-4	Arviat	Vertical	1990	Single Wall	Steel	EC-00000179	708,858	Diesel
603-5 Day	Arviat	Vertical	1985	Single Wall		EC-00000179	1,135	Diesel
603-6 Day	Arviat	Vertical	1980	Single Wall		EC-00000179	1,135	Diesel
604-1	Coral Harbour	Horizontal	1985	Single Wall	Steel	EC-00000180	92,226	Diesel

604-2 Day	Coral Harbour	Horizontal	1985	Single Wall		EC-00000180	1,135	Diesel
605-1	Chesterfield Inlet	Horizontal	1990	Single Wall	Gravel	EC-00000181	91,277	Diesel
605-2	Chesterfield Inlet	Horizontal	1990	Single Wall	Gravel	EC-00000181	91,181	Diesel
605-3 Day	Chesterfield Inlet	Horizontal	1990	Single Wall		EC-00000181	1,135	Diesel
606-1	Whale Cove	Horizontal	1990	Single Wall	Steel	EC-00000188	90,000	Diesel
606-2 Day	Whale Cove	Horizontal	1990	Single Wall		EC-00000188	1,135	Diesel
607-1	Repulse Bay	Horizontal	1988	Single Wall	Steel	EC-00000189	90,401	Diesel
607-2	Repulse Bay	Horizontal	1988	Single Wall	Steel	EC-00000189	90,401	Diesel
607-3 Day	Repulse Bay	Horizontal	1988	Single Wall		EC-00000189	1,135	Diesel
701-1	Iqaluit	Vertical	1994	Single Wall	Steel	EC-00000191	5,622,615	Diesel
701-2	Iqaluit	Horizontal	1994	Single Wall	Steel	EC-00000191	10,000	Diesel
701-3 Day	Iqaluit	Vertical	1994	Single Wall		EC-00000191	2,500	Diesel
701-4 Day	Iqaluit	Vertical	1994	Single Wall		EC-00000191	2,500	Diesel
701F-1	Iqaluit	Horizontal	1970	Single Wall	Steel	EC-00000192	91,402	Diesel
701F-2	Iqaluit	Horizontal	1970	Single Wall	Steel	EC-00000192	91,402	Diesel
701F-3	Iqaluit	Horizontal	1970	Single Wall	Steel	EC-00000192	67,870	Diesel
701F-4 Day	Iqaluit	Horizontal	1990	Single Wall		EC-00000192	2,270	Diesel
702-1	Pangnirtung	Horizontal	2015	Single Wall	Steel	EC-00000193		Diesel
702-2 Day	Pangnirtung	Vertical	2015	Single Wall		EC-00000193		Diesel
703-1	Cape Dorset	Horizontal	2017	Double Wall	Steel	TBD	90,000	Diesel
703-2	Cape Dorset	Horizontal	2017	Double Wall	Steel	TBD	90,000	Diesel
703-2 Day	Cape Dorset	Horizontal	1988	Single Wall		EC-00000194	1,135	Diesel
704-1	Resolute	Horizontal	1975	Single Wall	Concrete	EC-00000195	90,000	Diesel
704-2 Day	Resolute	Horizontal	1975	Single Wall		EC-00000195	1,135	Diesel
705-1	Pond Inlet	Horizontal	1992	Single Wall	Gravel	EC-00000197	91,000	Diesel
705-2	Pond Inlet	Horizontal	1992	Single Wall	Gravel	EC-00000197	91,000	Diesel
705-3 Day	Pond Inlet	Horizontal	1993	Single Wall		EC-00000197	1,135	Diesel
705-4 Day	Pond Inlet	Horizontal	1994	Single Wall		EC-00000197	1,135	Diesel
706-1	Igloolik	Horizontal	1995	Single Wall	Steel	EC-00000202	95,000	Diesel
706-2 Day	Igloolik	Horizontal	1995	Single Wall		EC-00000202	1,135	Diesel

707-1	Hall Beach	Horizontal	1990	Single Wall	Steel	EC-00000203	90,000	Diesel
707-2	Hall Beach	Horizontal	1990	Single Wall		EC-00000203	1,135	Diesel
708-1	Qikiqtarjuaq	Horizontal	1974	Single Wall	Steel	EC-00000204	91,903	Diesel
708-2	Qikiqtarjuaq	Horizontal	1974	Single Wall		EC-00000204	1,135	Diesel
709-1	Kimmirut	Horizontal	1993	Single Wall	Steel	EC-00000205	92,316	Diesel
709-2	Kimmirut	Horizontal	1993	Single Wall		EC-00000205	1,135	Diesel
710-1	Arctic Bay	Horizontal	1992	Single Wall	Steel	EC-00000206	91,903	Diesel
710-2	Arctic Bay	Horizontal	1992	Single Wall		EC-00000206	1,135	Diesel
711-1	Clyde River	Horizontal	1988	Single Wall	Steel	EC-00000207	94,988	Jet-A
711-2	Clyde River	Vertical	1981	Single Wall	Gravel	EC-00000207	640,149	Jet-A
711-3	Clyde River	Horizontal	1974	Single Wall		EC-00000207	1,135	Jet-A
712-1	Grise Fiord	Horizontal	2017	Double Wall	Steel	TBD	90,000	Diesel
712-2	Grise Fiord	Horizontal	2017	Double Wall	Steel	TBD	90,000	Diesel
712-3	Grise Fiord	Horizontal	2017	Double Wall	Steel	TBD	90,000	Diesel
712-4	Grise Fiord	Horizontal	2017	Double Wall	Steel	TBD	90,000	Diesel
712-4	Grise Fiord	Horizontal	1990	Single Wall		EC-00000208	1,135	Diesel
713-1	Sanikiluaq	Horizontal	1998	Single Wall	Steel	EC-00000209	90,149	Jet-A
713-2	Sanikiluaq	Horizontal	1998	Single Wall		EC-00000209	1,135	Jet-A
OffTank	Iqaluit Office	Horizontal	2010	Double	Steel	EC-00020546	4,500	Diesel

19,455,885

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**Site specific information plans** identify the nature of a particular plant and its fuel system and are separate documents attached to the beginning of this document. This is where community contacts, equipment, mapping and the particulars on infrastructure are identified.

The SCP presents information on site specifics, health and safety, response, reporting procedures, action plan, resource inventory, training and exercises.

### **QEC POLICIES & PHILOSOPHIES**

Working with products that in the event of a spill could cause damage to the environment, QEC is acutely aware of its responsibility to protect and conserve the environment. QEC believes that the first line of defense in the protection of the health and safety of employees, the community and the environment, must be the prevention of accidental escape of any contaminant. To this end, operating procedures are regularly updated and personnel are continuously trained to ensure for a safe and environmentally sound operation.

# MATERIAL SAFETY DATA SHEET Diesel Fuel

## SECTION 1

## PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT

**Product Name:** (see Section 16 for Synonyms) **MIDDLE**

**DISTILLATE Product Description:** Hydrocarbons and Additives

**MSDS Number:** 826

**Intended Use:** Fuel

### COMPANY IDENTIFICATION

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

### 24 Hour Environmental / Health Emergency Telephone

1-866-232-9563

<b>Transportation Emergency Phone Number</b>	1-866-232-9563
<b>Product Technical Information</b>	1-800-268-3183
<b>Supplier General Contact</b>	1-800-567-3776

## SECTION 2

## COMPOSITION / INFORMATION ON INGREDIENTS

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

Name	CAS#	Concentration*	Acute Toxicity
FUEL OIL NO. 2	68476-30-2	> 99 %	None

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

Name	CAS#	Concentration*	Acute Toxicity
NAPHTHALENE	91-20-3	< 1%	Dermal Lethality: LD50 > 2500 mg/kg (Rat); Inhalation Lethality: LC50 > 0.4 mg/l (Rat); Oral Lethality: LD50 622 mg/kg (Mouse)

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

## SECTION 3

## HAZARDS IDENTIFICATION

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

### PHYSICAL/CHEMICAL EFFECTS

Combustible. In use, may form flammable/explosive vapour-air mixture. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an ignition.

## HEALTH EFFECTS

Irritating to skin. If swallowed, may be aspirated and cause lung damage. Under conditions of poor personal hygiene and prolonged repeated contact, some polycyclic aromatic compounds (PACs) have been suspected as a cause of skin cancer in humans. May be irritating to the eyes, nose, throat, and lungs. High-pressure as a cause of skin cancer in humans. May be irritating to the eyes, nose, throat, and lungs. High-pressure injection under skin may cause serious damage.

**Target Organs:** Skin |

<b>NFPA Hazard ID:</b>	Health: 1	Flammability: 2	Reactivity: 0
<b>HMIS Hazard ID:</b>	Health: 1	Flammability: 2	Reactivity: 0

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

## SECTION 4

## FIRST AID MEASURES

### INHALATION

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

### SKIN CONTACT

Remove contaminated clothing. Dry wipe exposed skin and cleanse with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further skin contact to yourself or others. Wear impervious gloves. Launder contaminated clothing separately before reuse. Discard contaminated articles that cannot be laundered. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

### EYE CONTACT

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

### INGESTION

Seek immediate medical attention. Do not induce vomiting.

### NOTE TO PHYSICIAN

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

### PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

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

## SECTION 5

## FIRE FIGHTING MEASURES

### EXTINGUISHING MEDIA

**Appropriate Extinguishing Media:** Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

**Inappropriate Extinguishing Media:** Straight streams of water

## **FIRE FIGHTING**

**Fire Fighting Instructions:** Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

**Unusual Fire Hazards:** Combustible. Vapour is flammable and heavier than air. Vapour may travel across the ground and reach remote ignition sources, causing a flashback fire danger. Static discharge: material can accumulate static charges which may cause an incendiary electrical discharge. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

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

## **FLAMMABILITY PROPERTIES**

**Flash Point [Method]:** >40°C (104°F) [ASTM D-93]

**Flammable Limits (Approximate volume % in air):** LEL: 0.7 UEL: 6.5

**Autoignition Temperature:** N/D

## **SECTION 6**

## **ACCIDENTAL RELEASE MEASURES**

### **NOTIFICATION PROCEDURES**

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

### **PROTECTIVE MEASURES**

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

### **SPILL MANAGEMENT**

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

**Water Spill:** Stop leak if you can do so without risk. Confine the spill immediately with booms. Eliminate sources of ignition. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

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

## ENVIRONMENTAL PRECAUTIONS

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

## SECTION 7

## HANDLING AND STORAGE

### HANDLING

Avoid breathing mists or vapour. Avoid contact with skin. Do not siphon by mouth. It is dangerous and/or unlawful to put petrol into unapproved containers. Do not fill container while it is in or on a vehicle. Static electricity may ignite vapour and cause fire. Place container on ground when filling and keep nozzle in contact with container. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or ground procedures.

However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

**Static Accumulator:** This material is a static accumulator. A liquid is typically considered a nonconductive, static accumulator if its conductivity is below 100 pS/m (100x10E-12 Siemens per meter) and is considered a semi-conductive, static accumulator if its conductivity is below 10,000 pS/m. Whether a liquid is nonconductive or semi-conductive, the precautions are the same. A number of factors, for example liquid temperature, presence of contaminants, anti-static additives and filtration can greatly influence the conductivity of a liquid.

### STORAGE

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

## SECTION 8

## EXPOSURE CONTROLS / PERSONAL PROTECTION

Substance Name	Form	Limit/Standard			Note	Source
FUEL OIL NO. 2	Stable Aerosol.	TWA	5 mg/m <sup>3</sup>			Supplier
FUEL OIL NO. 2	Vapour.	TWA	200 mg/m <sup>3</sup>			Supplier
FUEL OIL NO. 2 [total hydrocarb, vapor&aerosol]	Inhalable fraction and vapour	TWA	100 mg/m <sup>3</sup>		Skin	ACGIH
NAPHTHALENE		STEL	15 ppm		Skin	ACGIH
NAPHTHALENE		TWA	10 ppm		Skin	ACGIH

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

## ENGINEERING CONTROLS

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

Adequate ventilation should be provided so that exposure limits are not exceeded.

## PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

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

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

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

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

If prolonged or repeated contact is likely, chemical-resistant gloves are recommended. If contact with forearms is likely, wear gauntlet-style gloves.

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

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

If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

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

## ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

## SECTION 9

## PHYSICAL AND CHEMICAL PROPERTIES

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

**GENERAL INFORMATION Physical State:** Liquid **Colour:** Clear (May Be Dyed) **Odour:** Petroleum/Solvent **Odour Threshold:** N/D

**IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION Relative**

**Density (at 15.5 °C):** 0.82 - 0.9

**Flash Point [Method]:** >40°C (104°F) [ASTM D-93]

**Flammable Limits (Approximate volume % in air):** LEL: 0.7 UEL: 6.5

**Autoignition Temperature:** N/D

**Boiling Point / Range:** 150°C (302°F) - 370°C (698°F)

**Vapour Density (Air = 1):** 4 at 101 kPa

**Vapour Pressure:** [N/D at 20°C] | 4 kPa (30 mm Hg) at 38°C

**Evaporation Rate (n-butyl acetate = 1):** < 1

**pH:** N/A

**Log Pow (n-Octanol/Water Partition Coefficient):** N/D

**Solubility in Water:** Negligible

**Viscosity:** 1.3 cSt (1.3 mm<sup>2</sup>/sec) at 40°C - 11 cSt (11 mm<sup>2</sup>/sec) at 40°C

**Oxidizing Properties:** See Hazards Identification Section.

**Pour Point:** -4°C (25°F) - -39°C (-38°F)

**SECTION 10**

**STABILITY AND REACTIVITY**

**STABILITY:** Material is stable under normal conditions.

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

**MATERIALS TO AVOID:** Strong oxidizers

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

**HAZARDOUS POLYMERIZATION:** Will not occur.

**SECTION 11**

**TOXICOLOGICAL INFORMATION**

**ACUTE TOXICITY**

Route of Exposure	Conclusion / Remarks
<b>Inhalation</b>	
Toxicity (Rat): LC50 > 5000 mg/m <sup>3</sup>	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
<b>Ingestion</b>	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
<b>Skin</b>	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: Data available.	Moderately irritating to skin with prolonged exposure.
<b>Eye</b>	

Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.
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Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Diesel fuel: Carcinogenic in animal tests. Caused mutations in-vitro. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased fetal resorptions at maternally toxic doses. Dermal exposure to high concentrations resulted in severe skin irritation with weight loss and some mortality. Inhalation exposure to high concentrations resulted in respiratory tract irritation, lung changes /infiltration /accumulation, and reduction in lung function.

**Contains:**

NAPHTHALENE: Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts. Naphthalene caused cancer in laboratory animal studies, but the relevance of these findings to humans is uncertain.

Additional information is available by request.

**CMR Status:**

Chemical Name	CAS Number	List Citations
FUEL OIL NO. 2	68476-30-2	4
NAPHTHALENE	91-20-3	3, 4

--REGULATORY LISTS SEARCHED--

1 = IARC 1  
2 = IARC 2A

3 = IARC 2B  
4 = ACGIH ALL

5 = ACGIH A1  
6 = ACGIH A2

**SECTION 12**

**ECOLOGICAL INFORMATION**

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

**ECOTOXICITY**

Material -- Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

**MOBILITY**

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

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

**PERSISTENCE AND DEGRADABILITY**

**Biodegradation:**

Hydrocarbon component -- Expected to be inherently biodegradable

**Atmospheric Oxidation:**

More volatile component -- Expected to degrade rapidly in air

**BIOACCUMULATION POTENTIAL**

Hydrocarbon component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

## SECTION 13

## DISPOSAL CONSIDERATIONS

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

### DISPOSAL RECOMMENDATIONS

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

### REGULATORY DISPOSAL INFORMATION

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

## SECTION 14

## TRANSPORT INFORMATION

### LAND (TDG)

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

### LAND (DOT)

**Proper Shipping Name:** HEATING OIL, LIGHT  
**Hazard Class & Division:** 3  
**ID Number:** 1202  
**Packing Group:** III  
**ERG Number:** 128  
**Label(s):** 3  
**Transport Document Name:** UN1202, HEATING OIL, LIGHT, 3, PG III

Footnote: The flash point of this material is greater than 38°C/100°F. Regulatory classification of this material varies. DOT: Flammable liquid or combustible liquid. OSHA: Combustible liquid. IATA/IMO: Flammable liquid.

### SEA (IMDG)

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

**Document Name:**

**AIR (IATA)**

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

**SECTION 15**

**REGULATORY INFORMATION**

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

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

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

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

**The Following Ingredients are cited on the Lists Below:**

<b>Chemical Name</b>	<b>CAS Number</b>	<b>List Citations</b>
NAPHTHALENE	91-20-3	5, 6

--REGULATORY LISTS SEARCHED--

1 = TSCA 4  
2 = TSCA 5a2

3 = TSCA 5e  
4 = TSCA 6

5 = TSCA 12b  
6 = NPRI

**SECTION 16**

**OTHER INFORMATION**

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

**THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:**

Revision Changes:

Section 04: First Aid Eye - Header was modified. Section 04: First Aid Ingestion - Header was modified.

Section 06: Protective Measures was modified.

Section 06: Notification Procedures - Header was modified.

Section 11: Acute Toxicity Table Header was modified.

Section 09: Phys/Chem Properties Note was modified.

Section 09: Physical State was modified.

Section 11: Inhalation - Header was modified.

Section 09: Boiling Point C(F) was modified.

Section 09: Evaporation Rate - Header was modified.

Section 08: Comply with applicable regulations phrase was modified. Section 09: VAPOUR PRESSURE was modified.

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

Section 13: Regulatory Disposal Information - Header was modified.

**SYNONYMS:** ULTRA LOW SULPHUR DIESEL, DIESEL MARINE, DIESEL LOW SULPHUR RAIL, DIESEL LOW SULPHUR, DIESEL LOW SULPHUR DYED, DIESEL NAVAL 3GP-15 DYED, DIESEL NAVAL 3GP-11, DIESEL MARINE GAS OIL, DIESEL REGULAR SULPHUR, DIESEL NAVAL 3GP-11 DYED, DIESEL REGULAR SULPHUR RAIL, DIESEL REGULAR SULPHUR DYED, DIESEL REGULAR SULPHUR RAIL #3, ESSO DIESEL FUEL, DIESEL REGULAR SULPHUR RAIL DYED, ESSO HEATING OIL, FURNACE FUEL DYED, FURNACE FUEL, ISO 8217 DMA, ISO 8217 DMB, NO. 2 FUEL OIL, REGULAR SULPHUR DIESEL FUEL, DIESEL MARINE DYED, DIESEL MARINE GAS OIL INTERNATIONAL, DIESEL MARINE GAS OIL DYED, DIESEL FUEL, AUTOMOTIVE (ON-ROAD) DIESEL FUEL, FURNACE LOW S DYED, FURNACE LOW S, DIESEL MARINE - NLA DYED, DIESEL LOW SULPHUR RAIL DYED

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**PRECAUTIONARY LABEL TEXT:**

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

**HEALTH HAZARDS**

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

**Target Organs:** Skin |

**PHYSICAL HAZARDS**

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

**PRECAUTIONS**

Product Name: MIDDLE DISTILLATE  
Revision Date: 16 May 2012  
Page 11 of 11

Avoid contact with skin. Do not siphon by mouth. Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation.

**FIRST AID**

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

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

**Skin:** Remove contaminated clothing. Dry wipe exposed skin and cleanse with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further skin contact to yourself or others. Wear impervious gloves. Launder contaminated clothing separately before reuse. Discard contaminated articles that cannot be laundered. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

**FIRE FIGHTING MEDIA**

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

**SPILL/LEAK**

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

**Water Spill:** Stop leak if you can do so without risk. Confine the spill immediately with booms. Eliminate sources of ignition. Remove from the surface by skimming or with suitable absorbents. Report spills as required to appropriate authorities. Seek the advice of a specialist before using dispersants.

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Prepared by: Imperial Oil Limited, IH and Product Safety

## **Material Safety Data Sheet Jet-A1**

**Material Name: Jet A1 MSDS ID: NA - 7**

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### **\*\*\*Section 1 - PRODUCT AND COMPANY IDENTIFICATION\*\*\***

Material Name: Jet A1

#### **Manufacturer Information**

North Atlantic Refining LTD Phone: (709) 463-8811 (24 hours)

P.O. Box 40 Fax: (709) 463-8076

Come by Chance , NL A0B 1N0 Emergency # CANUTEC : (613) 996 6666

#### **Chemical Family**

aromatic aliphatic hydrocarbons C9 - C16

#### **Product Use**

Turbine engine fuel

#### **Contact Hours:**

07:30 - 1600 HRS N.S.T.

Plant Industrial Hygienist

AFTER HOURS: Plant Security

### **\*\*\*Section 2 - HAZARDS IDENTIFICATION\*\*\***

#### **EMERGENCY OVERVIEW**

**Color:** water white

**Physical Form:** liquid

**Odor:** oily

**Health Hazards:** Irritant, aspiration hazard, suspect cancer hazard (in animals)

**Physical Hazards:** Combustible liquid and vapor.

#### **POTENTIAL HEALTH EFFECTS**

##### **Inhalation**

**Short Term:** Under normal conditions of use, inhalation of product is unlikely. Product has a low vapour pressure

(Below 38C). Inhalation of this material may cause coughing, headache, nausea and dizziness.

**Long Term:** No information on significant adverse effects.

##### **Skin Contact**

**Short Term:** Mild irritation. Not known to be a sensitizing agent.

**Long Term:** Repeated or prolonged exposure may cause irritation and/or dermatitis. May cause cancer.

##### **Eye Contact**

**Short Term:** May cause irritation of the eyes. Permanent damage is not suspected.

**Long Term:** Prolonged or repeated contact may cause irritation.

##### **Ingestion**

**Short Term:** Aspiration hazard. Ingestion of this material may cause nausea, vomiting, irritation to mouth, esophagus and stomach, potential CNS depression and unconsciousness.

**Long Term:** No information on significant adverse effects.

#### **OSHA Regulatory Status**

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

### **\* \* \*Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS\* \* \***

#### **CAS Component Percent**

8008-20-6 Kerosine, petroleum 100

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### **\* \* \*Section 4 - FIRST AID MEASURES\* \* \***

#### **Inhalation**

If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Give artificial respiration if not breathing. Get medical attention immediately.

#### **Skin**

Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists.

#### **Eyes**

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

#### **Ingestion**

Ingestion is not a likely route of exposure. This material is an aspiration hazard. If swallowed, do not induce vomiting. If vomiting occurs, keep head lower than hips to help prevent aspiration. Get medical attention immediately.

### **\* \* \*Section 5 - FIRE FIGHTING MEASURES\* \* \***

See Section 9 for Flammability Properties

**NFPA Ratings: Health: 2 Fire: 2 Reactivity: 0**

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

#### **Flammable Properties**

Combustible Liquid Vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.

#### **Extinguishing Media**

Use alcohol foam, dry chemical, or carbon dioxide. (Water may be ineffective.)

#### **Fire Fighting Measures**

Wear self-contained breathing apparatus and protective clothing. In case of fire, stop leak if safe to do so. Shut off fuel source, let the fire burn. Keep unnecessary people away, isolate hazard area and deny entry.

#### **Sensitivity to Mechanical Impact**

No

#### **Sensitivity to Static Discharge**

Yes

### **\* \* \*Section 6 - ACCIDENTAL RELEASE MEASURES\* \* \***

#### **Personal Precautions**

Wear protective gloves/clothing.

#### **Environmental Precautions**

Avoid release to the environment.

#### **Methods for Containment**

Keep unnecessary people away, isolate hazard area and deny entry. Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk.

#### **Methods for Cleanup**

For all water spills in Canada contact the Canadian Coast Guard, 1-800-563-2444. For land spills over 70L in

Canada contact the Canadian Coast Guard, 1-800-563-2444. **Small spills:** Eliminate all sources of ignition.

Collect with appropriate absorbent and place into suitable container. Dispose in accordance with all applicable federal, state/regional and local laws and regulations. **Large spills:** Eliminate all sources of

ignition. Ventilate the area. Stop leak if safe to do so - Prevent entry into waterways, drains, or confined areas. Collect with appropriate absorbent and place into suitable container. Dispose in accordance with all applicable federal, state/regional and local laws and regulations.

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**\*\*\*Section 7 - HANDLING AND STORAGE\*\*\***

**Handling Procedures**

Avoid contact with eyes, skin and clothing. Avoid breathing vapors or mists of this material. Wear special protective clothing as listed in Section 8. Wash thoroughly after handling. Do not eat, drink, or smoke when using this product. Keep away from heat and ignition sources. Ground and/or bond equipment.

**Storage Procedures**

Combustible liquid and vapor. Store in a cool, dry place. Store in a well-ventilated place. Keep away from heat and ignition sources. Dissipate static electricity during transfer by earthing (grounding and bonding) containers and equipment.

**\*\*\*Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION\*\*\***

\*

**Component Exposure Limits**

**Kerosine, petroleum (8008-20-6)**

**ACGIH:** 200 mg/m<sup>3</sup> TWA (application restricted to conditions in which there are negligible aerosol exposures, total hydrocarbon vapor)

Skin - potential significant contribution to overall exposure by the cutaneous route

**NIOSH:** 100 mg/m<sup>3</sup> TWA

**Engineering Controls**

Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

**PERSONAL PROTECTIVE EQUIPMENT**

**Eyes/Face**

Wear splash resistant safety goggles or face shield, as appropriate.

**Protective Clothing**

Wear suitable protective clothing. When handling product in drums, safety footwear should be worn. Contaminated clothing should be removed and laundered before reuse.

**Glove Recommendations**

Wear medium weight (22-30 mil) or heavier solvent resistant gloves.

**Respiratory Protection**

If engineering controls do not maintain exposure to an acceptable level, respiratory protection may be needed.

**\*\*\*Section 9 - PHYSICAL AND CHEMICAL PROPERTIES\*\*\***

**Appearance:** bright, clear **Color:** water white

**Physical Form:** liquid **Odor:** oily

**Odor Threshold:** Not available **pH:** not applicable

**Melting Point:** -30 F **Boiling Point:** 180 - 205 C

**Flash Point:** 38 C **Evaporation Rate:** Not available

**LEL:** 1.0 **UEL:** 6

**Vapor Pressure:** 21 kPa 20 C **Vapor Density (air = 1):** >5

**Density:** Not available **Specific Gravity (water = 1):** 0.775 - 0.840

**Water Solubility:** negligible **Coeff. Water/Oil Dist:** 2 - 6

**Auto Ignition:** No data available **Viscosity:** 4.8 St 20 C

**Oxidizing Properties:** None **Miscibility:** No data available

**Fat Soluble:** Yes **Conductivity:** Negligible

**\*\*\*Section 10 - STABILITY AND REACTIVITY\*\*\***

**Chemical Stability**

Stable at normal temperatures and pressure.

**Conditions to Avoid**

Avoid excessive heat and ignition sources. Avoid creation of vapor or mist.

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### **Materials to Avoid**

halogens, strong acids, alkalis, strong oxidizing materials

### **Decomposition Products**

oxides of carbon, oxides of nitrogen, oxides of sulfur

### **Possibility of Hazardous Reactions**

Hazardous polymerization will not occur.

## **\* \* \*Section 11 - TOXICOLOGICAL INFORMATION\* \* \***

### **Component Analysis - LD50/LC50**

The components of this material have been reviewed in various sources and the following selected endpoints are published:

#### **Kerosine, petroleum (8008-20-6)**

Inhalation LC50 Rat >5.28 mg/L 4 h; Oral LD50 Rat >5000 mg/kg; Dermal LD50 Rabbit >2000 mg/kg

### **Component Carcinogenicity**

#### **Kerosine, petroleum (8008-20-6)**

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

## **HEALTH EFFECTS**

### **Inhalation - Acute Exposure**

Under normal conditions of use, inhalation of product is unlikely. At elevated temperatures: May cause irritation and central nervous system effects including nausea, headache, dizziness, fatigue, drowsiness or unconsciousness.

### **Inhalation - Chronic Exposure**

No information on significant adverse effects.

### **Skin Contact - Acute Exposure**

Causes mild skin irritation. Not known to be a sensitizing agent.

### **Skin Contact - Chronic Exposure**

Repeated or prolonged exposure may cause irritation and/or dermatitis. May cause cancer.

### **Eye Contact - Acute Exposure**

May cause irritation of the eyes. Permanent damage is not suspected.

### **Eye Contact - Chronic Exposure**

Prolonged or repeated contact may cause irritation.

### **Ingestion - Acute Exposure**

Aspiration hazard. Harmful if aspirated into the lungs.

### **Ingestion - Chronic Exposure**

No information on significant adverse effects.

## **\* \* \*Section 12 - ECOLOGICAL INFORMATION\* \* \***

### **Component Analysis - Aquatic Toxicity**

No LOLI ecotoxicity data are available for this product's components.

## **\* \* \*Section 13 - DISPOSAL CONSIDERATIONS\* \* \***

### **Disposal Methods**

Dispose in accordance with all applicable regulations. The container for this product can present explosion or fire hazards, even when emptied! To avoid risk of injury, do not cut, puncture or weld on or near this container.

### **Component Waste Numbers**

The U.S. EPA has not published waste numbers for this product's components.

## **\* \* \*Section 14 - TRANSPORT INFORMATION\* \* \***

### **US DOT Information**

**Shipping Name:** Kerosene

**UN/NA #:** UN1223 **Hazard Class:** 3 **Packing Group:** III

**Required Label(s): 3**

**TDG Information**

**Shipping Name:** Kerosene

**UN #: UN1223 Hazard Class: 3 Packing Group: III**

**Required Label(s): 3**

**\*\*\*Section 15 - REGULATORY INFORMATION\*\*\***

**U.S. Federal Regulations**

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section

311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

**SARA Section 311/312 (40 CFR 370 Subparts B and C)**

**Acute Health: Yes Chronic Health: Yes Fire: Yes Pressure: No Reactive: No**

**U.S. State Regulations**

The following components appear on one or more of the following state hazardous substances lists:

**Component CAS CA MA MN NJ PA**

Kerosine, petroleum 8008-20-6 No Yes No Yes Yes

Not regulated under California Proposition 65

**Canada**

WHMIS CLASSIFICATION: B3, D2A D2B

**Component Analysis - Inventory**

**Component CAS US CA EU AU PH JP KR CN NZ**

Kerosine, petroleum 8008-20-6 Yes DSL EIN Yes Yes Yes Yes Yes

**\*\*\*Section 16 - OTHER INFORMATION\*\*\***

**Summary of Changes**

New MSDS: March 1, 2013

**Key / Legend**

ACGIH = American Conference of Governmental Industrial Hygienists. AICS = Australian Inventory of Chemical

Substances. CAS = Chemical Abstract Service. CERCLA = Comprehensive Environmental Response, Compensation and Liability Act. CFR = Code of Federal Regulations. CHEMTREC = Chemical

Emergency Center. DSL = Canadian Domestic Substance List. EINECS = European Inventory of New and

Existing Chemical Substances. EPA = Environmental Protection Agency. HEPA = High Efficiency Particulate Air.

HMIS = Hazardous Materials Identification System. IARC = International Agency for Research on Cancer. IDLH

= Immediately Dangerous to Life and Health. MITI = Japanese Ministry of International Trade and Industry. NDSL

= Canadian Non-Domestic Substance List. NFPA = National Fire Protection Association. NIOSH = National

Institute of Occupational Safety and Health. NJTSR = New Jersey Trade Secret Registry. NTP = National Toxicology Program. OSHA = Occupational Safety and Health Administration. NA = Not available or Not Applicable. SARA = Superfund Amendments and Reauthorization Act. TDG = Transportation of

Dangerous Goods. TLV = Threshold Limit Value. TSCA = Toxic Substances Control Act. WHMIS = Workplace Hazardous

Materials Information System.

**Other Information**

The information contained herein is based on the data available to us and is believed to be correct. However,

North Atlantic Refining Limited makes no warranty, expressed or implied regarding the accuracy of these data or results to be obtained from the use thereof. North Atlantic Refining Limited assumes no responsibility for injury from the use of the product described herein.

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End of Sheet NA - 7

**Cross-reference of STS Regs, s. 30 to 32, to this emergency plan**

<b>STS Regs reference</b>	<b>Information required</b>	<b>Location of information in this emergency plan</b>
s. 30(1)	The owner or operator of a storage tank system must prepare an emergency plan taking into consideration the following factors:	
s. 30(1)(a)	- the properties and characteristics of each petroleum product (i.e. Jet A1) or allied petroleum product stored in each tank of the system and	MSDS for diesel fuel on page 5
s. 30(1)(a) continued	- the maximum expected quantity of the petroleum product or allied petroleum product to be stored in the system at any time during any calendar year; and	- Site Description of each site in site specific folder
s. 30(1)(b)	- the characteristics of the place where the system is located and of the surrounding area that may increase the risk of harm to the environment or of danger to human life or health.	- Site Description of each site, sections entitled "Location and Topography", "Land Use/Status", and "Wildlife" supplemented by site drawings and, where available, photos.
s. 30(2)	The emergency plan must include:	
s. 30(2)(a)	- a description of the factors considered under s. 30(1)	- See the rows above.
s. 30(2)(b)	- a description of the measures to be used to prevent, prepare for, respond to, and recover from any emergency that may cause harm to the environment or danger to human life or health;	- Spill Contingency Plan for Petroleum, Oil, & Lubricants (POL) and Hazardous Materials in its entirety and specifically: This plan originally spill contingency plan
s. 30(2)(c)	- a list of the individuals who are required to carry out the plan and a description of their roles and responsibilities;	Responsibilities outlined page 23

<b>STS Regs reference</b>	<b>Information required</b>	<b>Location of information in this emergency plan</b>
s. 30(2)(d)	- identification of the training required for each of the individuals listed under s. 30(2)(c);	Under training page 32
s. 30(2)(e)	- a list of the emergency response equipment included as part of the plan, and the equipment's location; and	- Equipment tables in each site specific plan
s. 30(2)(f)	- the measures to be taken to notify members of the public who may be adversely affected	Under communication page 37

	by the harm or danger referred to in s. 30(2)(b)	
s. 30(3)	The owner or operator of a storage tank system must ensure that the emergency plan is ready to be implemented:	
s. 30(3)(a)	- in the case of a storage tank system that is installed before the coming into force of these Regs, no later than two years after the day on which these Regs come into force (i.e. by 12 Jun 2010); and	- Emergency Plan prepared Nov 2008 adapted Spill contingency plan
s. 30(3)(b)	- in any other case, before the day on which the first transfer of petroleum products or allied petroleum products into any tank of the storage tank system occurs.	- Emergency Plan is in place for every site.
s. 31(1)	The owner or operator of a storage tank system must keep: - the emergency plan up-to-date and - keep a copy of it readily available for the individuals who are required to carry it out, - as well as a copy at the place where the storage tank system is located if that place is a place of work.	- Emergency Plan will be updated as needed. -This Emergency Plan along with the Site Specific information is posted on QEC Intranet and is provided to all plant facilities .
s. 31(2)	The owner or operator must notify the Minister of the civic address of each location where the emergency plan is kept.	Notified Environment Canada through regulatory agent

<b>STS Regs reference</b>	<b>Information required</b>	<b>Location of information in this emergency plan</b>
s. 32(1)	If the owner or operator of a storage tank system has prepared an emergency plan with respect to the system on a voluntary basis or for another government or under an Act of Parliament and the plan meets the requirements of s. 30(1) and (2), they may use that plan for the purposes of meeting those requirements.	- This Emergency Plan uses: QEC's Spill Contingency Plan as the main body of the Emergency Plan for the STR.
s. 32(2)	If the plan does not meet all of the requirements of s. 30(1) and (2), the owner or operator may use the plan if they amend it so that it meets all of those requirements.	- See the row above.

To ensure safe fuel transfers between tanks at the plant, along the fuel transfer pipeline or from a fuel transport truck to the tanks at the plant, the following safeguards have been implemented by QEC:

1.

At all times during the transfer of fuel between tanks at the plant, along the fuel transfer pipeline or from a fuel transport truck to the tanks at the plant, a minimum of one qualified QEC employee, who has been trained in the procedures required under the Emergency Procedures and Response, will be on duty and on location.

2. Any employee involved in transfer operations for QEC has full authority to stop the fuel transfer if they deem it unsafe for any reason. The employee in charge of the transfer operation will take the appropriate action to contain or control any released product as quickly as possible providing it can be done safely.
3. QEC will conduct appropriate training and exercise programs in accordance with the schedule found in Section 2 of this plan, to ensure that personnel are properly trained.
4. Health and safety policies/ procedures established by QEC will be followed during all fuel transfers as well as during any spill cleanup.
5. Inspections of tanks and pipelines for leaks or potential leaks are performed and logged on a regular basis. Joints and flex connectors are scrutinized for movement and integrity as well as pumps, valves and monitoring hardware. QEC bulk fuel systems are upgraded and maintained regularly as a result of these frequent inspections.
6. A preventative maintenance schedule will be established and followed for all safety and response equipment in order to ensure that it is always in a state of readiness. A detailed equipment list can be found in Section 8.
7. In the event of an oil spill incident, regardless of volume, transfer operations will be shut down until:
  - a) There are enough personnel on site to manage the transfer operation and the spill response as separate entities; and
  - b) Consultation between the onsite QEC supervisor and the fuel supply contractor(s) have determined that it is safe to resume operations.

A detailed and complete set of fuel transfer procedures is posted in the appendix and also can be found on the QEC intranet site as well as the Safety/ Environment drive.

## THE PLAN DYNAMICS CONTINUUM

To keep this plan active, up-to-date and maintain employee focus we will:

- **Prepare** by training and scenarios to maintain an awareness of potential hazards that surround personnel and surroundings at the Facility.
- **Respond** in an efficient and effective manner to incidents big or small. Log all incidents in report form detailing procedures taken.
- **Review** all procedures and results by qualified QEC personnel. The actions taken will be evaluated and conclusions will be drawn.
- **Implement** these conclusions into the plan to help plant personnel prevent similar future incidents.

This method ensures for a dynamic contingency plan with the ability to remain effective with changing circumstances.

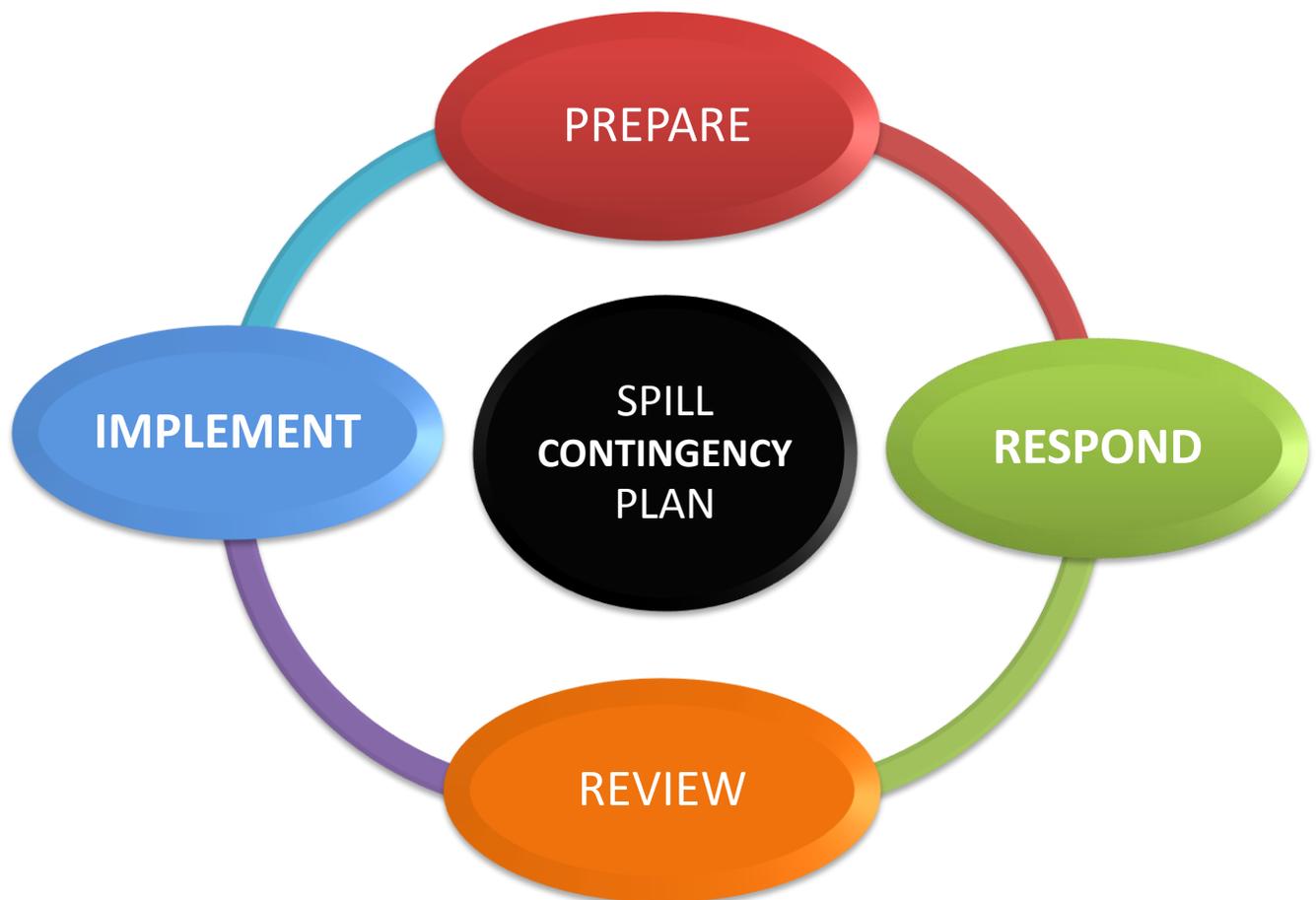


Figure 1-Plan Dynamics Continuum

## **DECLARATION**

The **Director of Operations** for **Nunavut** declares that:

On the detection of an oil pollution incident that arises out of the loading or unloading of oil to or from a fuel transport truck, the Facility will report any oil pollution incident in accordance with the procedures established in Section 6.0 of this Spill Contingency Plan (SCP).

The person or persons listed below are authorized to implement the Spill Contingency Plan (SCP) on advice from the local Plant Operator, who may change from season to season:

Operations Supervisors or their designate for the areas of the Nunavut Region:

Qikiqtaaluk Area (Baffin)	Robert Sheaves 867-979-7505
Kitikmeot Area (Cambridge)	Tony Villebrun 867-983-7135
Kivalliq Area (Rankin)	Johnny Tulugak 867-645-5301

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Andrew Burns  
Director of Operations

## SITE PERSONNEL

### Current Plant Superintendant contact list

Region	Hamlet	Superintendent	After Hrs	Plant	Plant Fax
<b>Kitikmeot</b>	501 Cambridge Bay	Andre Otokiak	983-7115	983-7107	983-2055
	502 Gjoa Haven	Andrew Porter	360-1203	360-1201	360-1202
	503 Taloyoak	Larry Qilluniq	561-1203	561-1201	561-1202
	504 Kugaaruk	Stephan Inaksajak	769-1203	769-1201	769-1202
	505 Kugluktuk	Peter Carpenter	982-1203	982-1201	982-1202
<b>Kivalliq</b>	601 Rankin Inlet	Lewis Voisey	645-2184	645-5309	645-2487
	602 Baker Lake	Darryl Simailak	793-1203	793-1201	793-1202
	603 Arviat	Donald Baker	857-1203	857-1201	857-1202
	604 Coral Harbour	Joseph Angootealuk	925-1203	925-1201	925-1202
	605 Chesterfield	Larry Ittinuar	898-1203	898-1201	898-1202
	606 Whale Cove	Steven Inukshuk	896-1203	896-1201	896-1202
	607 Repulse Bay	Lazarie	462-1203	462-1201	462-1202
<b>Qikiqtaaluk</b>	701 Iqaluit	David Ford	975-1116	979-7501	979-7512
	702 Pangnirtung	Billy Evic	473-1203	473-1201	473-1202
	703 Cape Dorset	Paul Kowmageak	897-1203	897-1201	897-1202
	704 Resolute	Solomon Idlout	252-1203	252-1201	252-1202
	705 Pond Inlet	Kain Killiktee	899-1203	899-1201	899-1202
	706 Igloolik	Steven Inooya	934-1203	934-1201	934-1202
	707 Hall beach	Peter Kaunak	928-1203	928-1201	928-1202
	708 Qikiqtarjuaq	Gary Metuq	927-1203	927-1201	927-1202
	709 Kimmirut	Cameron Bobinski	939-1203	939-1201	939-1202
	710 Arctic Bay	Tagornak Willie	439-1203	439-1201	439-1202
	711 Clyde River	Joatamie Qillaq	924-1203	924-1201	924-1202
	712 Grise Fiord	Imooshee Nutaraqjuk	980-1203	980-1201	980-1202
	713 Sanikiluaq	Johnny Kudluarok	266-1203	266-1201	266-1202

\*Assistant operators (not listed here) may at any time be designated by the plant superintendent

## **ROLES AND RESPONSIBILITIES**

### **On Site QEC Employee(s)**

The onsite personnel will be present for every fuel transport truck delivery at the Facility. They will also be present for a pipeline delivery whether from a tanker or from another tank. They have the appropriate training and either directs or personally deploys the boom, as per the plan, in the event of a water based spill. This person may be a designate for plant superintendent.

### **Plant Superintendent**

Since the Plant Superintendent is on site, they have knowledge of the specific procedures that need to be followed to complete the fuel transfer in a safe and secure way. The Plant Superintendent has the responsibility and authority to initiate the emergency response plan. They are responsible for site safety, notification of management and the local contractor(s). It is also expected that once the local contractor(s) arrives on site, they will supervise and direct the cleanup activity until complete or authority is passed to an onsite commander.

### **Area Operations Supervisor**

The Area Operations Supervisor is notified by the Plant Superintendent about any oil spill incident (on land or water) in the specific communities. This person is responsible for ensuring that the response to an oil pollution incident (initiated by the Plant Superintendent) at the oil handling facility is immediate, effective and sustained. The Canadian Coast Guard (CCG) will have the ability to be in contact with this person should a water based spill occur.

### **Environmental Specialist**

The Environmental Specialist is notified by onsite personnel and is briefed on the specifics of an incident. This person will communicate with regulatory agents and will report to proper authorities. This person will also communicate with QEC management, convey appropriate actions needed beyond the scope of onsite personnel and address requests and concerns raised by authoritative regulators. If an action plan needs to be drawn, this person will create an outline of specific tasks and provide details for proper procedures to be carried out.

## PLAN MAINTENANCE AND CONTROL

The Area Operations Supervisor is responsible for the distribution, maintenance and update of the Facilities' SCP. This SCP will be updated;

- annually, taking into account changes in the law, in environmental factors and in Facility characteristics and policy, and
- after every spill incident and exercise

Changes in phone numbers, names on individuals etc. that do not affect the intent of the plan are to be made on a regular basis. Plan updates in accordance with the above, along with a control page, will be issued as per the SCP distribution list. After adding new and/or removing obsolete pages, the SCP holder will complete the control page.

This plan is also part of the QEC Emergency Plan which will be up-dated as changes are made to the spill plan.

All Standard Operating Procedures (SOP's) required for this plan will be regularly reviewed and updated as per the QEC Environmental Management System (EMS).

## LEAK DETECTION

Leak detection is an ongoing monitoring process at all QEC facilities. Two areas of operational activities are covered namely Monthly Visual Inspections and Inventory Reconciliation.

Monthly Visual Inspections require operators to walk the pipeline from any transfer point though to the fuel tank/s it supplies. QEC staff will watch for any signs of wear or leakage in the system and record their observations on a form which is submitted to their Operations Supervisor along with their month-end report. The condition and quantity of spill kits are also recorded on this form to notify managers of dwindling spill response supplies. A blank copy of this form is on the following pages. Observations and notes are also made on a day to day basis as part of regular activities and any anomalies are reported immediately.

In 2010 QEC standardized the method in which it recorded fuel transfers and volumes. Originally each tanks' precise measurements were taken and formulas were applied to spreadsheets to automatically calculate the temperature factor and volume of fuel in the tank. This initial set of calculators were then tested, adjusted then in 2013 the entire set was posted on an online database which handles all QEC tanks in Nunavut. By having precise measurements of fuel and trending fuel usage, QEC staff can identify when problems such as when leaks or spills occur.

# MONTHLY TANK INSPECTION FORM

<b>QULLIQ ENERGY CORPORATION</b> ENVIRONMENTAL MANAGEMENT SYSTEM		
<i>EMS Form</i>	<i>Prepared by: Maurice Guimond</i>	<i>Issue Date: March 10, 2010</i>
<i>EFR-07 Aboveground Storage Tank &amp; Spill Kit Monthly Visual Inspection</i>	<i>Approved by: Rick Hunt</i>	<i>Rev. # 1 / Rev Date: March 11, 2011</i>

Plant #:  Community:  Inspected By:  Date:  Click for date.

*This form is used as a monthly visual inspection for Nunavut Power's above ground storage tanks and piping system. Keep these records on file as they are required for compliance for the Storage Tank Systems for Petroleum Products Regulations.*

1. Are there any visible leaks on foundations, tanks, tank seams, connections, fittings or valves?  NO  
 YES

If "yes," identify tank & describe leak. Record action taken to correct problem and date of action.

2. Are there any visible leaks in piping, pipe seams, connections, fittings, flanges, threads, pumps or valves?  NO  
 YES

If "yes," identify & describe leak. Record action to correct problem and date of action.

3. Is overfill prevention equipment in good operating condition?  NO  
 YES  N/A

If "no," identify tank. Record action taken to correct problem and date of action.

4. Are pumps and pump handling equipment operating properly?  NO  
 YES  N/A

If "no," identify tank. Record action taken to correct problem and date of action.

5. Secondary containment system (berms) free of tank product or other liquids/debris, such as rainwater, snowmelt, dirt, leaves, trash, etc.)

NO  YES  
 If "no," identify tank. Record action taken to correct problem and date of action.

6. Is the ground free of any evidence of new leakage or spillage?  NO  
 YES

If "no," describe. Record action taken to correct problem and date of action.

7. Ladders, walkways, supports and tanks free of any signs of damage or deficiencies.  NO  
 YES

If "no," describe condition or damage.

Page 1 of 2

Report Suspected or Confirmed Leaks to the Area Operations Supervisor Immediately  
 Baffin (867) 979-7505 Kivalliq (867) 793-5301 Kitikmeot (867) 983-7102  
 Manager HS&E (867) 979-7522 Environmental Specialist (867) 979-7526

<b>QULLIQ ENERGY CORPORATION</b> <b>ENVIRONMENTAL MANAGEMENT SYSTEM</b> 		
<i>EMS Form</i>	<i>Prepared by: Maurice Guimond</i>	<i>Issue Date: March 10, 2010</i>
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**8. Additional Comments (i.e. any new dents, scrapes, or need new paint?)**

To handle a 150L oil or fuel spill you need the following at hand.

**Spill Kits (Checklist)**

**246 L - over-pack kit (large spill kit) contains:**

- 2 – 13cm x 3m booms (5" x 10') -----  Click to
- 9 – 8cm x 3m booms (3" x 10') \*these are the small socks\*-----  Click to Check
- 40 – 38cm x 41cm absorbent pads (15" x 16") -----  Click to Check
- 10 – Temporary disposal bags and ties (garbage bags) -----  Click to Check
- 2 – Oil resistant gloves (nitrile gloves) -----  Click to Check
- 1 – Pair safety goggles-----  Click to Check

The equivalent length of booms, socks and pads can be used or 2 of the smaller type of spill kit (Seton, in the blue drum with white top)

Make sure the Spill Contingency Plan is always accessible and that the appropriate emergency numbers are posted near a phone. These kits are meant to handle an emergency spill so must contain the above list. Promptly replace partially used materials with new sorbents to the kit.

Tank system #

NOTES:

## CONTROL PAGE

### QEC Spill Contingency Plan (SCP) control.

On receipt of revision and/or amendments, the Plan holder will complete this Control Page to ensure that the plan is always current.

Revision Number	Date Inserted	Description/ Purpose	Signature
1	Nov. 2007	Annual update	<i>M Guimond</i>
2	July 2008	Annual update	<i>M Guimond</i>
3	Feb. 2009	Annual update	<i>M Guimond</i>
4	Feb. 2010	Annual Update and restructuring	<i>M Guimond</i>
5	Jan. 2011	Annual update, contacts and mapping	<i>M Guimond</i>
6	Nov. 2011	Contacts and communication procedure	<i>M Guimond</i>
7	Nov. 2012	Annual Update	<i>M Guimond</i>
8	May 2013	Update for storage regs	<i>M Guimond</i>
9	Dec 2014	Update for storage regs	<i>M Guimond</i>
10	Dec 2015	Update contacts	<i>M Guimond</i>
11	Sept 2016	Update contacts	<i>M Guimond</i>
12	Jan 2017	Update contacts	<i>M Guimond</i>
13	Jan 2018	Update contacts/ Fuel systems	<i>M Guimond</i>

## PLAN DISTRIBUTION

The copy may be electronic. The current plan is available on the QEC intranet, on the 'T' drive under Safety and Environment and as a hard copy at the site facility.

Number	Issued To
4	Copies to Canadian Coast Guard
1	Government of Nunavut, Dept. of Environment
1	Facility/ Plant
1	Administration Office
1	Area Office
1	Head Office

## RELATIONSHIP WITH OTHER PLANS

The Facility recognizes that there are other plans or organizations that may be integrated into any response. The following chart outlines this relationship.

**(The Canadian Coast Guard will only be involved with a water based spill.)**

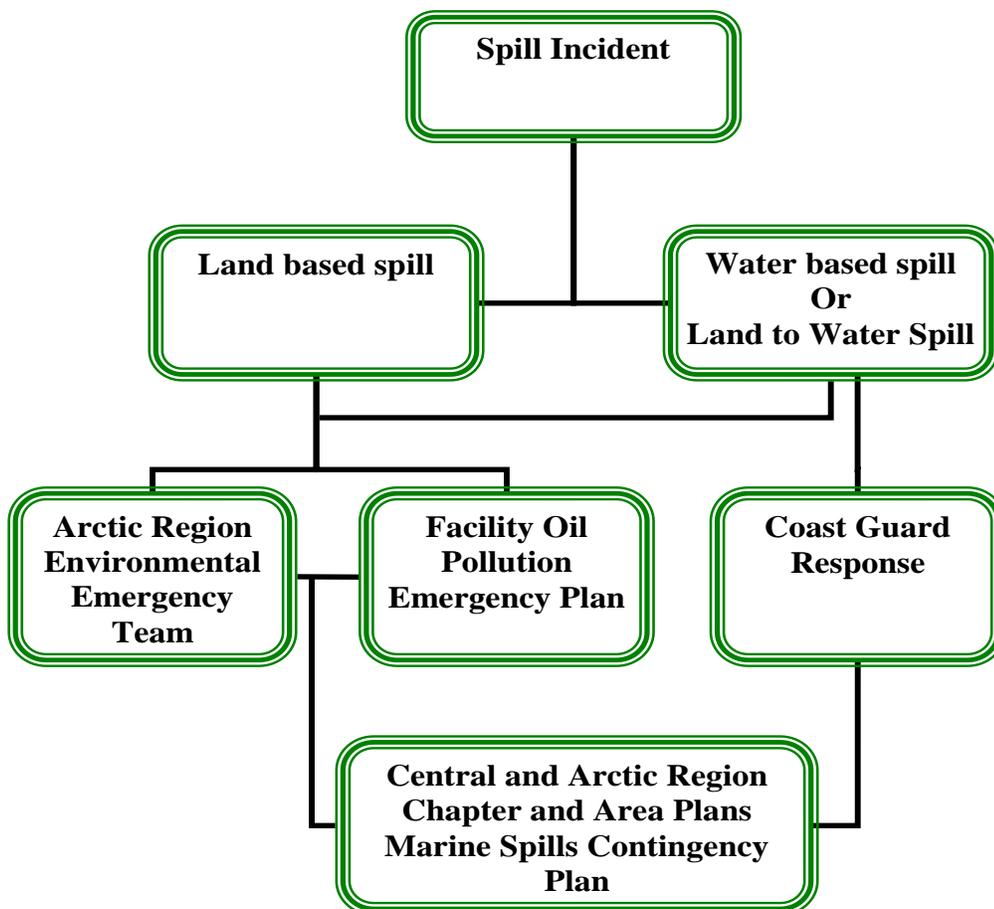


Figure 2- Relationships with other Spill Plans

## Arctic REET

Having been notified about a major spill incident through the spill report lines and placed on Standby Alert by the REET chairman, the Arctic REET will proceed through the following steps:

- The chairman will confer with the Lead Agency and the EPB Division Manager regarding the nature, magnitude and extent of the spill
- The Arctic REET will be activated by the EPB Division Manager or the REET Chairman *at the request of the Lead Agency*. Requests to activate the REET are generally limited to major spills with associated environmental and social impacts.
- The Chairman will advise (by telephone, fax and/or by email) all members, agencies and organizations who have jurisdiction or interest in the incident that the Arctic REET has been activated. Members will be asked to participate directly in REET meetings

## Canadian Coast Guard (CCG)

### Excerpts from the CCG Letter of Promulgation

Through legislation such as the *Canada Shipping Act*, the *Arctic Waters Pollution Prevention Act*, the *Oceans Act*, and subject to various inter-agency agreements, the Canadian Coast Guard of the Department of Fisheries and Oceans has lead agency responsibility for ensuring responses to ship-source spills, mystery spills, and ship-source pollution incidents that occur as a result of loading or unloading to or from ships at oil handling facilities in waters of Canadian interest.

The Canadian Coast Guard *Marine Spills Contingency Plan* defines the scope and framework within which the Canadian Coast Guard will operate to ensure a response to marine pollution incidents. The polluter is expected to respond to incidents, while the Canadian Coast Guard will monitor and, whenever necessary, augment or assume management of the response when it is in the interest of the public. The Canadian Coast Guard also provides assistance to other federal, provincial, territorial or local agencies.

The Canadian Coast Guard *Marine Spills Contingency Plan* is divided into the following three chapters:

- National Contingency Chapter, which establishes the Canadian Coast Guard policy for the conduct and procedure for monitoring a polluter-led response or responding to a marine pollution incident for which it is the lead agency or where it supports another agency leading the response;
- Regional Contingency Chapter, that corresponds to the Canadian Coast Guard regional geographic areas of responsibility and which translates policy direction into operational measures appropriate to the geographic area;
- Area Contingency Chapter, that are local level plans pursuant to the Regional Contingency Chapter.

The custodian for the overall coordination of the Canadian Coast Guard *Marine Spills Contingency Plan* is the Director General, Rescue, Safety and Environmental Response, Canadian Coast Guard Headquarters, Ottawa.

David B. Watters  
Commissioner

# Health and Safety

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## **INTRODUCTION**

The QEC firmly believes that the health and safety of its employees, contractors and the general public is of utmost importance. The QEC has a program in place to comply with applicable health and safety requirements. Upon hire, every employee and contractor will receive a safety orientation and copy of the QEC Safety Rule Book. During the operation of any fuel transfer, strict adherence will be paid to the non-smoking policy. The Safety Continuum as in section 1.3 outlines QEC policy.

## **SITE CONTROL**

In the event of an Oil Pollution Incident (OPI), an immediate assessment will be made to ensure that the site is secure. Oil Pollution Incidents (OPIs) can attract curious onlookers, and the site must be controlled in such a way as to ensure that they are kept well outside any hazardous-area zone. Only those directly involved in the containment, control or cleanup of the Oil Pollution Incident (OPI) should be allowed in the general vicinity of the spilled product. This rule is very important as there are many issues surrounding the possible injury of non-authorized and unqualified individuals. Insurance, liability, capability and general health and safety of the public are a few. If the Oil Pollution Incident (OPI) escalates to involve the services of the Canadian Coast Guard (CCG), the Canadian Coast Guard (CCG) will have an established Health and Safety protocol.

### **1. Fires:**

There will be two fully charged 20 lb. Class ABC fire extinguishers and a communication plan to alert personnel. This is an integral part of the response plan.

### **2. Slippery rocks, decks or other wet surfaces:**

All Persons working on an Oil Pollution Incident (OPI) must wear oil-resistant rubber steel-toed safety boots with textured bottoms while working on a cleanup site.

### **3. Work on or near water:**

All persons working on docks, piers, jetties or in close proximity to the water must wear the appropriate Personal Flotation Devices (PFDs). Persons working on shore near water do not have to wear PFDs unless they are actually working over the water.

**4. High noise exposure:**

All personnel must wear hearing protection when operating equipment or machinery or when in areas where noise levels require personnel to raise their voices to be heard.

**5. Buddy System:**

A buddy system must be observed at all times when workers are in the work area. Persons must work within sight of their assigned partner (buddy) at all times.

**6. Personal Protective Equipment (PPE) requirements:**

- a) Selection of outer PPE will be based on the potential for whole body contact with the product. A potential for repeated contact will require rain gear (top/bottoms). Clothing will be kept fully zippered when handling those materials. Supervising personnel may authorize the removal of suit tops if there is not potential for upper body contact.
- b) Personnel with high body-contact potential will tape gloves and boots.
- c) Personnel with limited skin contact potential may wear disposable clean guard garments or equivalent. Personnel with no exposure potential (inspectors, monitors etc.) need not wear protective clothing.
- d) All personnel on shore cleaning operations will wear safety glasses (regular glasses will not be satisfactory).
- e) Personnel handling contaminated materials will wear outer chemical resistant gloves. Sleeves will be taped whenever handling heavily contaminated wet materials. This will happen during removal of oil-soaked sorbents or shoveling oil-soaked snow and dirt.

**7. Hypothermia:**

Hypothermia is a condition of having the body temperature fall below 36°C (96.8°F), at which point the individual will likely suffer reduced mental alertness, reduction in rational decision-making and loss of consciousness with the threat of fatal consequences. The **hypothermia treatment chart for a field situation** can be found in the appendix.

## **PROTECTION OF THE COMMUNITY**

Any significant spillage of product such as diesel may cause a significant threat to the community if the vapour plume approaches a populated area. Based on the wind direction a determination of the potential area of impact will be made and the community notified of any potential hazard.

If the spill approaches or enters a watercourse, lake or ocean the community will be notified of any potential hazard to drinking or recreational activities.

## **DECONTAMINATION**

Adjacent to, or near the Oil Pollution Incident (OPI) zone, decontamination stations will be established. The decontamination stations will be laid out so that personnel will pass through the station prior to leaving the contaminated area. The decontamination stations may be bermed and lined with plastic sheeting. Washing solutions may be placed near the OPI Zone. All solutions in tubs will be clearly marked.

**Note: Notwithstanding the preceding, all applicable health and safety rules, regulations, and legislation will be adhered to. The health and safety specialist will be consulted as well as any other staff that may possess expertise regarding the health and safety of all involved.**

# Training

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## **INTRODUCTION**

Response preparedness includes ensuring that employees are properly trained in Oil Pollution Incident (OPI) response, containment and control and have a clear understanding of what their mandate is in the event of an Oil Pollution Incident (OPI). This mandate will be clearly communicated to the employees and endorsed by senior management.

## **RESPONDER TRAINING**

The success of any Oil Pollution Incident (OPI) response depends on a clear mandate as to expectations and adequately trained personnel. The level of training has to be tailored to the functions to be performed and the skills of the individual. In the case of the Facility, it provides specific training to the Facility employees. For all ship to shore fuel transfers, all workers are trained in the Supervisor of Oil Transfer Operations (SOTO) course. This course is not required for QEC employees as marine transfers are led by marine personnel. It is assumed that if the Canadian Coast Guard (CCG) is called in, its employees and contractors are adequately trained.

## **Training for Casual Employees**

When fuel is delivered to northern communities, casual employees may be hired for the loading/off loading or transfer procedures. These employees will be trained based on the program QEC has in place to comply with applicable health and safety requirements. Upon hire, every employee and contractor will receive a safety orientation and copy of the QEC Safety Rule Book. During the operation of any fuel transfer, strict adherence will be paid to the non-smoking policy.

## **BASIC OIL SPILL RESPONSE TRAINING (BOSRC)**

This program is directed towards QEC employees and provides training in fundamental Oil Pollution Incident (OPI) response and safety. All Plant Operators will be required to receive training and certification in BOSRC. The course outline is as follows:

<b>1. Site Safety</b> a) Securing the site <ul style="list-style-type: none"><li>- sources of ignition</li><li>- air intakes</li><li>- site access</li></ul>
b) Safe Working Environment This consists of: <ul style="list-style-type: none"><li>- general safety awareness</li><li>- slips, trips, falls and strains</li><li>- weather, including heat stress and cold</li><li>- unauthorized use of drugs, alcohol and firearms</li></ul>
c) Personal Protective Equipment (PPE) <ul style="list-style-type: none"><li>- goggles</li><li>- barrier suits/protective clothing</li><li>- footwear</li><li>- hard hats</li><li>- floatation devices when working on or over water</li></ul>
<b>2. Personal Hygiene</b> <ul style="list-style-type: none"><li>- washing hands etc. and removing clothing exposed to oil</li><li>- decontamination procedures</li></ul>
<b>3. Product Awareness</b> <ul style="list-style-type: none"><li>- Material Safety Data Sheet review</li><li>- Fire and explosion</li><li>- Health effects</li></ul>
<b>4. Equipment Operations</b>

The frequency and complexity of training depends on the size of the Facility and the number of personnel that could be involved in and Oil Pollution Incident (OPI) response situation. Also, the amount of training depends on how well the employees have learned the system and whether or not modifications to the Oil Pollution Incident (OPI) response system are needed, which would call for retraining. In this case the Facility personnel of the particular plant will receive comprehensive initial training with an annual refresher.

A summary of Oil Spill Response Training received by the Facility employees is found in the appendix.

## **SHORT-NOTICE EMPLOYEES/ VOLUNTEERS**

If the Facility should hire short-notice employees or use volunteers, they will be used in specific jobs working under the direction of a qualified person. The facility will ensure that these persons receive the Basic Health and Safety Training Course. The following is an outline of this course.

### **Basic Health and Safety Training Course**

#### Course Objective

This course is designed to provide response personnel with the information and knowledge to understand the health and safety issues associated with the provision of marine spill response services.

#### Course Scope

This course outlines the responsibilities of both the employer and the employee concerning safety at the work site.

To describe the hazards associated with petroleum products.

To describe the safety practices and considerations associated with land-based operations.

## **RESPONSE TRAINING FOR VOLUNTEERS/ SHORT-NOTICE EMPLOYEES**

In response to an oil spill incident, volunteers, contractors and short notice employees may be called upon to assist in the control, recovery or disposal of the spilled fuel. Before anyone is allowed into what is considered the “hazardous area”, the appropriate training/orientation must be given. The training given will be similar to the Basic Oil Spill Response Course (BOSRC). If more specific/ specialized training is needed then the necessary training will be given by a certified instructor.

## **TRAINING EXERCISES**

The SCP should be put to use through a training exercise before a real spill occurs. This training exercise serves the purposes of training personnel, evaluating the ability of the staff to respond to a spill, and demonstrating the ability to respond to a spill. The result of a training exercise should be to identify areas for improvement for the existing contingency plan and the application of the contingency plan.

Training exercises may consist of a **tabletop** exercise, or an **operational** exercise. A tabletop exercise is simpler than an operational exercise, is mainly theory and may be completed during a facility visit by area or regional staff.

A **tabletop** exercise may occur during a meeting of the people involved in a spill response at a given facility. The simplest way to organize a tabletop exercise is to write up a spill situation that may occur, and go through the steps in dealing with the spill using the maps and information in the SCP. The tabletop exercise should not be limited by time, and the discussion of the steps in dealing with a spill should be thorough.

Prior to the tabletop exercise the SCP should be reviewed and discussed to make sure everyone understands the information.

The second type of training exercise is an **operational** exercise, which would involve the deployment of resources required to test the contingency plan. Equipment is deployed and will indicate not only knowledge and readiness of the responder but of the equipment used for containment and clean-up. An operational exercise would be designed in the stages of programming, planning, conducting, evaluating, and reporting. An operational exercise would be organized on an area or regional basis for a number of powerhouse facilities to make best use of time and resources.

## **TRAINING ORGANIZER**

The person who gives a training exercise will keep accurate records of who has been trained and what training these individuals have received. A copy of the trained employees and their qualifications will be kept in this (SCP). Therefore the QEC will know who has the appropriate training in response to a spill incident.

## **Exercise Programs**

Exercise is a demonstration of capability. After the employees have been appropriately trained in response techniques, the following indicates the frequency and type of exercise.

### **Frequency**

3 Year Cycle

### **Type**

Paper exercises are carried out involving notification and verification of internal contacts and external contacts including the local contractor(s) and the Canadian Coast Guard (CCG).

There will be an equipment deployment at the Facility utilizing the Facility personnel. The Facility will seek the co-operation from a vessel if available with equipment deployment when possible while the vessel is at the Facility. Where it is possible the Canadian Coast Guard (CCG) will be invited to observe the exercise.

Each exercise will be evaluated on an "Exercise observation document." All discrepancies noted will be followed up with action plans to correct and this plan will be up-dated with amendments reflecting changes noted during exercises.

Any actual response to a spill of product will be evaluated and recorded, and will be considered as part of this program.

When possible regulatory agencies will be invited to attend and participate in this *Exercise Program*.

# Communication

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## GENERAL POLICY

**All statements to the media will be directed by QEC Corporate Affairs. There should be no statements to the press by immediate responders. QEC qualified personnel will provide expert advice and only after the facts have been established.**

No speculation should be made with regard to who is at fault, why the Oil Pollution Incident (OPI) occurred, or any other issue. It is also the responsibility of the company representative at the site to keep the QEC HSE department informed so that media questions directed to Corporate Affairs can be answered.

With the increasing concern for the environment and widespread coverage of environmental issues, incidents that in the past have only attracted local media coverage are now attracting regional and national coverage. In many major disasters the press will be on the scene long before a representative from Corporate Affairs can be on site. The local personnel should feel free to cooperate with the media to the best of their ability. Lack of cooperation only serves to antagonize the media, leading to suspicions. The media may then seek out any kind of information on which to report. The tone of both the immediate and continuous press coverage of all pollution incidents is influenced by the way, in which reporters or other media personnel are treated by company representatives. Everything within reason should be done to cooperate with the press. They should be permitted to view the Oil Pollution Incident (OPI) scene from a reasonable and safe distance and to take photographs. Assistance in relaying their stories by providing communication facilities is essential.

## **Do's and Don'ts with the Media**

The following is a list of some “do’s” and “don’ts” as far as reporting to the press, the public and the government is concerned:

- **DO** provide information about how to contact QEC Corporate Affairs
- **DO** set up special communication points for handling all queries from the news media with QEC Corporate Affairs. If possible, this should be completely separated from the main emergency control office to cut down on the amount of confusion and to keep the cleanup communication system free from media interference.
- **DON'T** admit liability or speculate about the cause of an Oil Pollution Incident.
- **DON'T** estimate how long it will take to clean up the Oil Pollution Incident (OPI). (Such factors as weather, current and unknown conditions make such guessing extremely hazardous and inappropriate).
- **DON'T** talk publicly about evidence, confusion, company policy, lack of response on behalf of the company, etc. These off-hand statements can be misinterpreted and lead to gross misrepresentation.
- **DON'T** promise to bring everything back to what it was before the Oil Pollution Incident (OPI) since that may be impossible to do.

## Plant Superintendent Communication Procedures

### Qulliq Energy Corporation Fuel Spill Contingencies

Prompt and proper communications for spills are critical to the success of any clean-up operation.

They are also vital because they will show that you, as the first person to know about a problem, have acted according to Corporation procedures and training. The communication actions that you take will help save the environment and property, and will reflect on everyone in the Corporation.

The calm and firm communication response of a knowledgeable superintendent will also ensure that procedures are carried out in a **safe, logical and efficient** nature.

The following is the order of communications that you must follow:

Where life or property is in danger, you have an emergency. **Get help.** Contact the local fire department, police or municipal authority.

Your immediate contact is the regional Operations Supervisor then the Environmental Specialist. They will make the other contacts necessary. Your immediate communications requirements are done.

However, you will be asked to assist with information on an ongoing basis.

The company contact in the event of a fuel or hazardous material spill of any size is the **NWT & NU SPILL LINE at (867) 920-8130.**

**Respond fully with any request** from local authorities or emergency workers that will help to control the spill and its damage.

The Environmental Specialist or Director HSE will fill out the Spill Report and submit it to the proper authorities. The Spill report is on the next page.

# NT-NU SPILL REPORT



## NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

TEL: (867) 920-8130

FAX: (867) 873-6924

EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR		REPORT TIME		<input type="checkbox"/> ORIGINAL SPILL REPORT, OR <input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER _____
	B OCCURRENCE DATE: MONTH - DAY - YEAR		B OCCURRENCE TIME			
C	LAND USE PERMIT NUMBER (IF APPLICABLE)			WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION				REGION <input type="checkbox"/> NWT <input type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATTITUDE			LONGITUDE		
	DEGREES	MINUTES	SECONDS	DEGREES	MINUTES	SECONDS
F	RESPONSIBLE PARTY OR VESSEL NAME		RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION			
G	ANY CONTRACTOR INVOLVED		CONTRACTOR ADDRESS OR OFFICE LOCATION			
H	PRODUCT SPILLED		QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES		U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)		QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES		U.N. NUMBER	
I	SPILL SOURCE		SPILL CAUSE		AREA OF CONTAMINATION IN SQUARE METRES	
J	FACTORS AFFECTING SPILL OR RECOVERY		DESCRIBE ANY ASSISTANCE REQUIRED		HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS					
L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE	
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT	ALTERNATE TELEPHONE	
REPORT LINE USE ONLY						
N	RECEIVED AT SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLED	REPORT LINE NUMBER	
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CCG <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> LA <input type="checkbox"/> INAC <input type="checkbox"/> NEB <input type="checkbox"/> TC				SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY		CONTACT NAME		CONTACT TIME		REMARKS
LEAD AGENCY						
FIRST SUPPORT AGENCY						
SECOND SUPPORT AGENCY						
THIRD SUPPORT AGENCY						

# Insurance and Legal

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## **INSURANCE**

Where a fuel transfer pipeline or fuel transport truck owned or operated by a third party is involved, prompt notice must be given to the third party advising them that the Facility will be holding them responsible for the cleanup costs and damages resulting from the Oil Pollution Incident (OPI).

The Facility employees must recognize that fuel transport trucks involved in delivering products to the Facility are required to carry insurance to cover their operations. Claims will therefore be made against the fuel transport truck's insurance coverage. The Facility's role is to ensure in the first place that the cleanup is done effectively and efficiently. However, when the expenses incurred are to be recovered from a third party, records of the costs, which have been incurred, are essential. In the case of a major Oil Pollution Incident (OPI), specialized representatives from the various insurers will assist on this. For Oil Pollution Incidents of a minor nature resulting in damage to a third party's property, the Facility's adjuster can provide assistance.

## **LEGAL**

In the case of a major Oil Pollution Incident (OPI) involving potentially large expenditures for cleanup costs and contentious claims from third parties, specialized legal counsel must be consulted.

All actions performed by the responder and other QEC support personnel must occur within the law. The regulations with which QEC complies are listed in the QEC compliance directory manual which can be found under the HSE intranet section.

# Techniques for the Responder

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## Introduction

There are many approaches to containing spills depending on the source (also related to the amount), whether it is on land or water and if the spilled product is moving. The first section will discuss land spills.

All areas in Nunavut are north of the permafrost line. Ground conditions particularly in colder months can be advantageous for steering a moving spill to an area for containment. The porous soil conditions in summer however can also work against containment efforts when product is absorbed. Knowledge of trenching and damming is essential to the effective responder.

## Land Containment

### Trenches

**Earth** trenches are practical only under **summer** conditions. The trench must be dug to bedrock or impermeable ground. If water is present in the excavated trenches, it should be assumed that contamination could result and eventually be discharged into surface waters. A waterproof liner may be placed on the bottom and sides of the trench to prevent seepage. Shallow trenches placed down slope of the spill will be effective in trapping fuel from surface run-off and if care is taken from slightly below the surface.

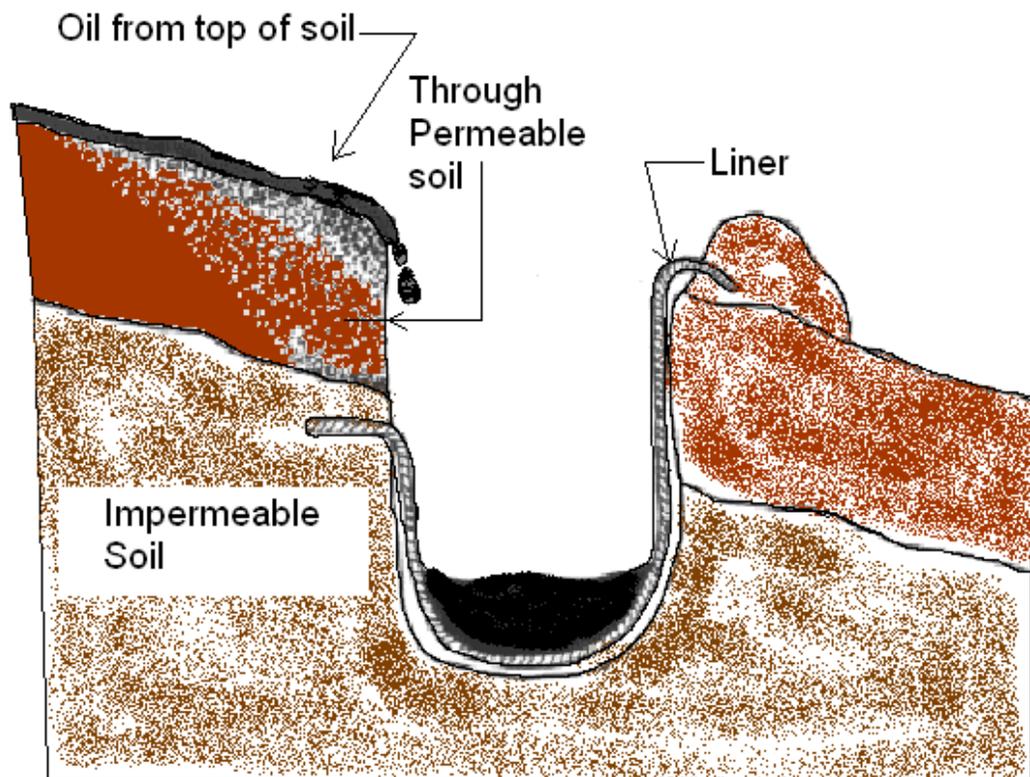


Figure 3-Typical earth trench

Trenches can be dug to divert the oil away from environmentally sensitive areas and streams.

The material and equipment needed for trench construction are a backhoe, loader, dozer, shovels, picks and waterproof liners.

## **Trenching in sand, snow and ice**

Some things to consider

All of QEC's facilities are north of the continuous frost line. Sand and rocky ground conditions are common as well as snow and ice. In some ways these conditions are good because the spill will not penetrate rock or ice as readily. It is then a matter of steering the flow into a suitable position for easy recovery down slope. A natural depression down slope can be used for temporary containment along with a plastic liner.

Snow actually makes a very good sorbent particularly when it is light and dry much like the snow that is prevalent above the tree line. The contained snow then can be later disposed of with an approved and suitable oil- water separator.

In some ways these conditions may hinder spill containment. Sand will allow fuel to filter through until it hits permafrost. The oil will then flow with the slope beneath the surface layers and make guiding the spill difficult. It is important not to let this happen if at all possible.

Oil can also lower the freezing point of ice and snow. The slushy mix that results will flow as steady as syrup. The oil flow can also create its own trench and form tunnels that cannot be seen from the surface. It is important to know how much is flowing and the direction of flow to effectively steer and contain the spill. See the figure Plywood Barriers later in this chapter as they can be used for diverting a land spill below the snow surface.

## Dams

Earth or snow dams constructed across ditches may be used to contain a spill and stop its flow. A dam may be built with earth, wood, sandbags, and snow. The dam should be lined with plastic sheeting to make it impermeable to the spilled product. In the *winter*, water may be sprayed on snow dams forming ice to make it impermeable.

Care should be taken to ensure that the dam is large enough to contain the entire spill; insufficient capacity may result in overtopping failure. For ditches with flowing water or for small streams, it may be necessary to allow water flow to continue and to retain the lighter-than-water liquids.

Water bypass dams may be constructed on small, slow flowing ditches or streams. An earth dam is built stopping the flow of water and oil in the ditch. Water is then allowed to continue down the ditch by piping water from below the level of the fuel.

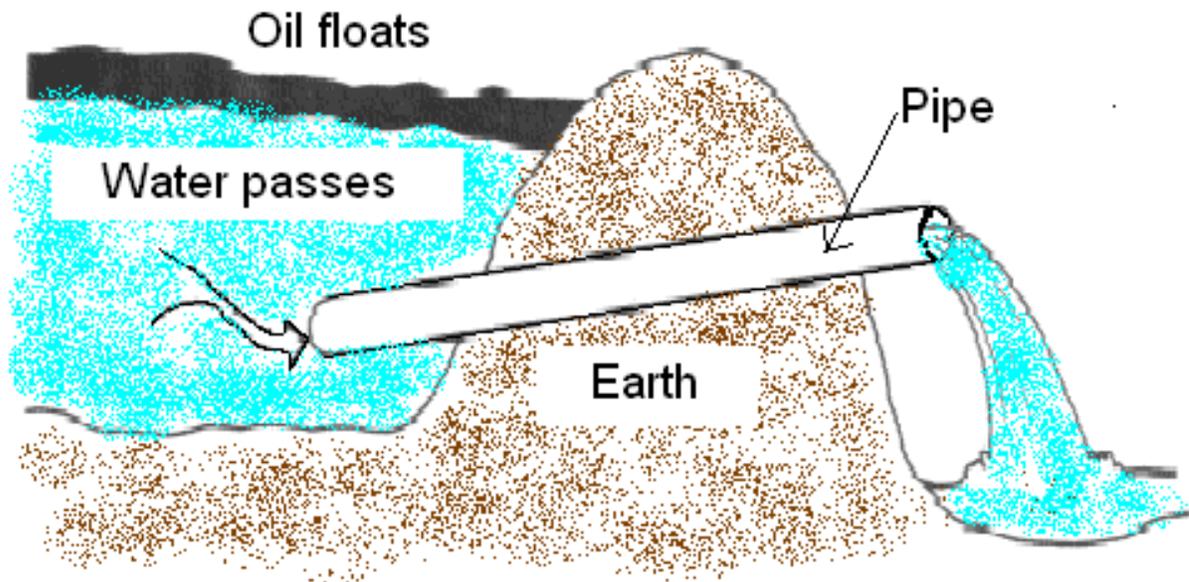


Figure 4- Water bypass dam using 3" ABS pipe

## Weirs

Weirs may be also used in ditches and at culverts. Materials commonly used such as plywood, lumber and sheet metal may be placed to completely or partially block culvert entrances. These barriers are effective on slow moving streams.

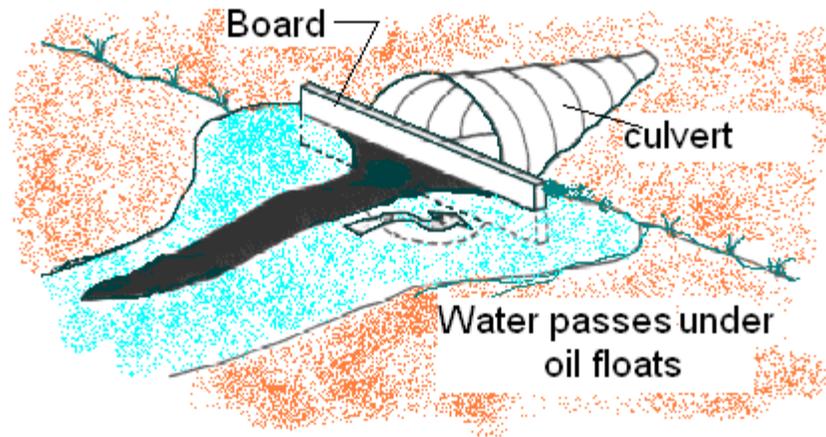


Figure 5- Weir solution at a culvert

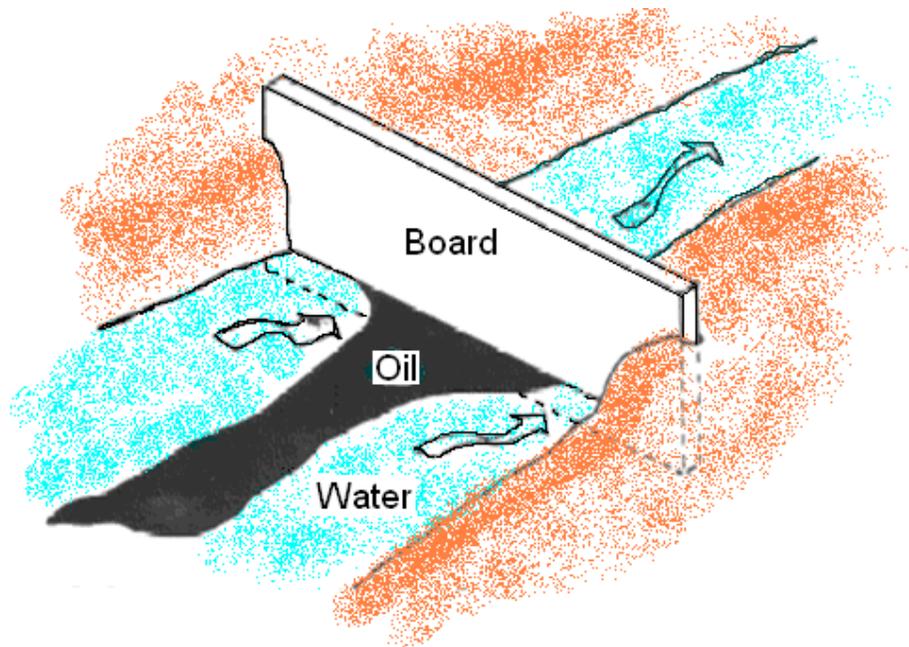


Figure 6- Weir solution mid-stream

## **Water Containment**

Water containment measures generally include the use of barriers or booms. Unless the entire flow of contaminated water can be stopped by damming, these methods are limited to the containment and recovery of materials that can be separated and float on water.

Certain materials such as gasoline or other volatile or flammable petroleum products have a high risk of fire or explosion. For these materials, containment and evaporation (without recovery) or burning may be a preferred approach.

## **Barriers – Snow Fence and Sorbent Barrier**

Snow fence and sorbent barriers may be used in streams (less than 1 m deep) with soft beds into which stakes can be driven. This method is limited to *summer* conditions. A snow fence barrier is installed to span the width of the stream, anchored at both ends, and stakes are driven into the stream bottom at 1 to 2 m intervals. Straw bales or commercial sorbents are placed on the upstream side.

### **Barrier and Sorbent**

Sorbent will float against the upstream side of the barrier but must be replaced before they sink. The barrier should be angled against the current for shore side collection. Multiple snow fence barriers can provide backup against potential losses from upstream barriers. Net or chicken wire barriers can be constructed in the same way. For stronger currents, these are more practical since water can flow through more easily.

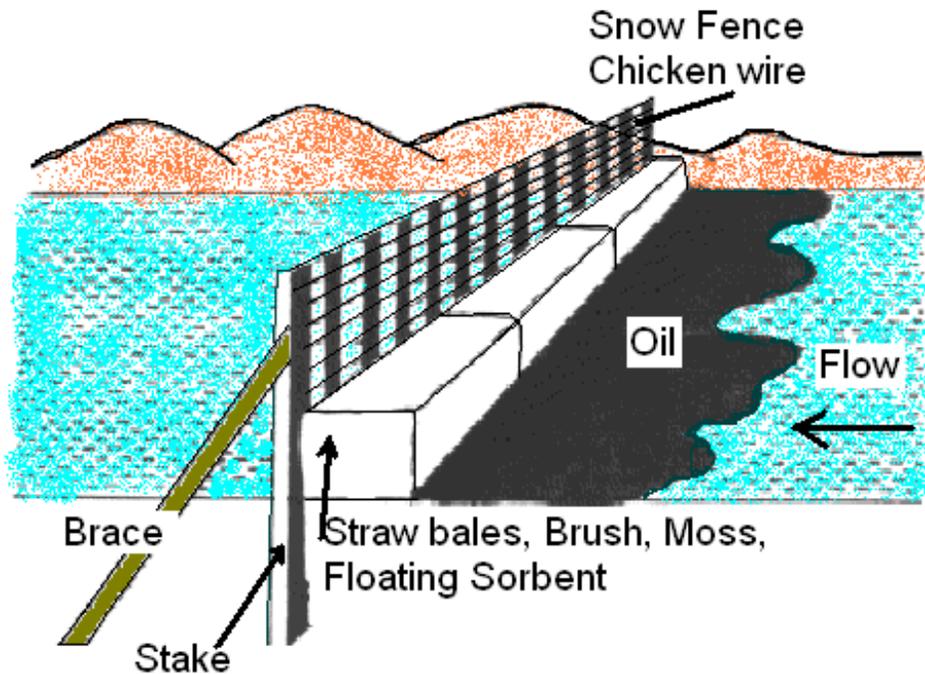


Figure 7- For larger streams and rivers. The chicken wire serves only to hold back the floating sorbent while allowing water to pass.

## **Booms**

The general principles in using a boom are to contain a spill of floating liquid or debris, to deflect or divert material to a defined area so that it may be recovered, and to protect sensitive areas from contamination.

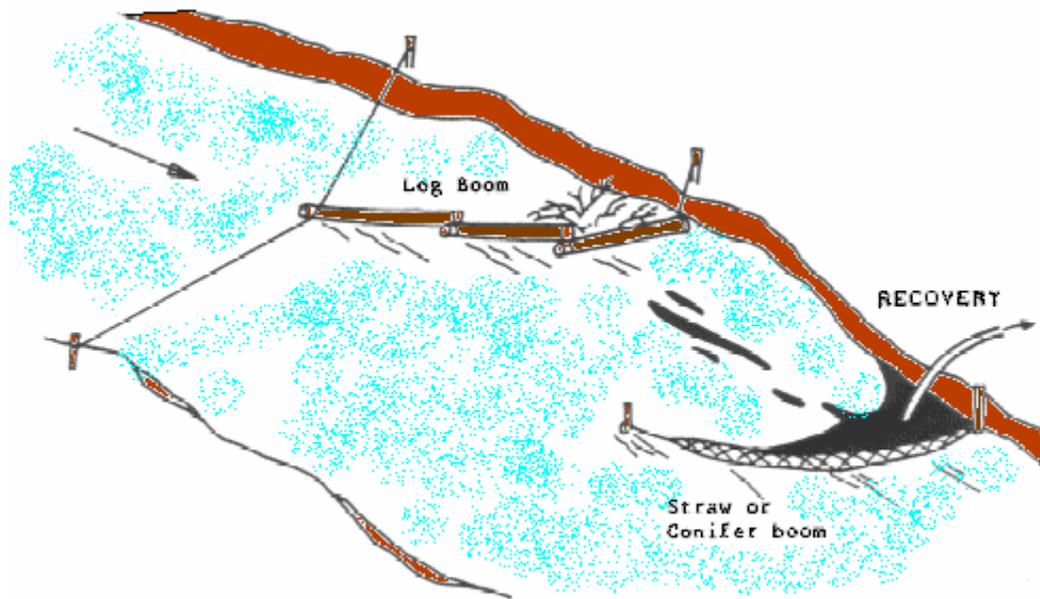


Figure 8- Successive booms for faster streams can steer an elusive slick.

### Boom Deployment

Boom deployment is important because the angle of the boom relative to how fast the water is moving affects how well the oil may be contained. The faster the stream, the more angled the boom.

Several booms arranged in parallel may be necessary to contain all the fuel. These should be spaced to allow for fuel, which may escape the first boom, to float to the surface and be contained by the next boom. In addition, the use of several booms permits the removal of a boom for cleaning.

Booms may be either commercially made or homemade. Commercially made booms are designed to float and keep oil from escaping under the boom. Homemade booms may be constructed from logs, railroad ties, telephone or power poles, trees or lumber. These may be used to deflect floating material to shore or to keep floating material within a contained area. Individual sections are connected together by rope, chain or wire. A seal around the joints to prevent leakage can be made by wrapping with plastic sheets or burlap.

Wooden or other floating booms can be used to contain the spilled fluid itself or the sorbent containing the fuel. They can also be used upstream of sorbent booms to improve the efficiency and longevity of the sorbent material.

Inflated fire hose or Styrofoam can also be used as homemade booms.

## Containment under Ice

Ice slotting may be used in rivers or streams when current speeds are slow, less than 0.5 m/second. A trench is cut into the ice using a chain saw or “ditchwitcher” machine at an angle to the current, to deflect and concentrate oil that passes through the area. Because of the thick ice encountered during the winter, cutting and removal of ice blocks is often difficult. Loaders or backhoes may be needed to lift blocks out of the slot, or backhoes may be used to push blocks down. Oil, which accumulates in the ice slot, may be pumped out, absorbed or burned in place.

### Angled Ice Slot

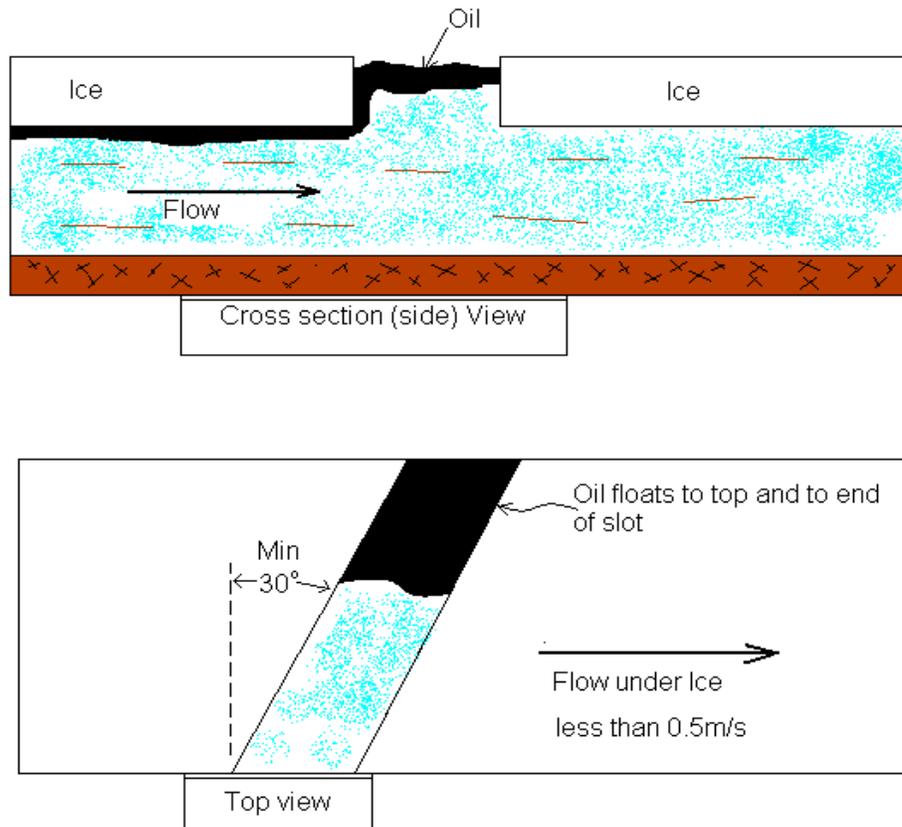


Figure 9- Ice can help in capturing a floating slick considering the flow rate is low

Vertical barriers in ice such as plywood may be used to deflect oil under ice in slow moving deep waters. The ice must be strong enough to support the necessary personnel and equipment. Vertical barriers are put in place by cutting trenches in ice at an angle to current flow, inserting the plywood barriers and allowing them to freeze in place. The location of the oil slick may be monitored by drilling observation holes with an ice auger.

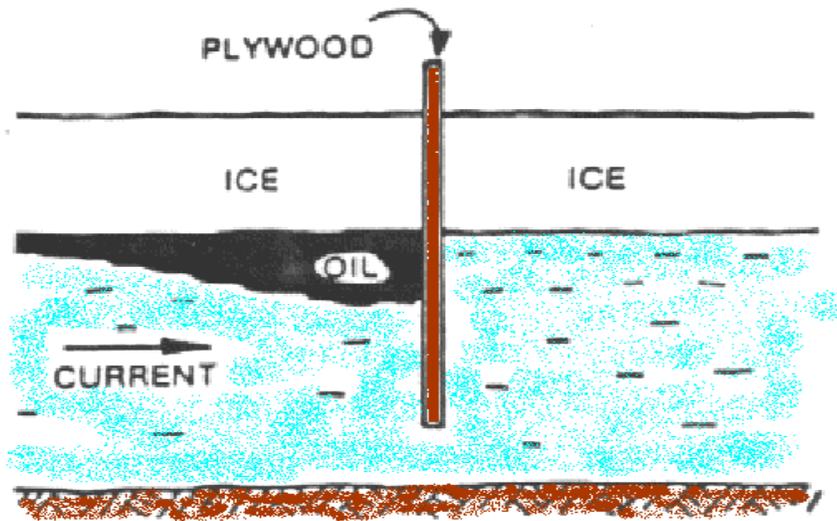


Figure 10- Inserting a plywood barrier through an ice slot properly means sizing the slot just right. The slick can be recovered ahead of the barrier by means of drilling.

Sometimes it is best to do little

In three situations:

1. When oil is spilled in a sensitive environment, it is sometimes best to leave the clean-up to nature, as the activity itself may cause more damage.
2. Sometimes natural removal processes are faster or more effective than human efforts. For example, some storms can make shoreline conditions unsafe, but may also remove the oil quite effectively.
3. Areas such as the fiords and rocky coasts along the Canadian Arctic Archipelago are also best left, because the action of high-energy waves will break up the oil.

## Weather Affects Response Activities

The response team depends on weather reports to provide information that is essential for tracking, containing and cleaning up a spill. The location of the accident, the season, the time of day, and the type of response actions planned will influence what information is useful. Decisions on which clean-up and containment methods to use depend on present and forecast weather conditions at the spill site. Meteorologists provide:

- forecasts of wind shifts and strengths;
- warnings of severe weather, such as high winds, blizzards and ice storms;
- information on wave heights, air and sea temperature, and air mass stability;
- forecasts of the icing potential, wind chill, fog, and visibility; and
- information on the presence and movement of ice flows.

## Larger scale water containment

In open water situations such as a bay or lake a slick may need to be isolated so as not to reach shore or to prevent spreading. A boat deployment of a boom may be necessary. The contained slick may be removed with a skimmer or with sorbents.

### Boat deployed boom

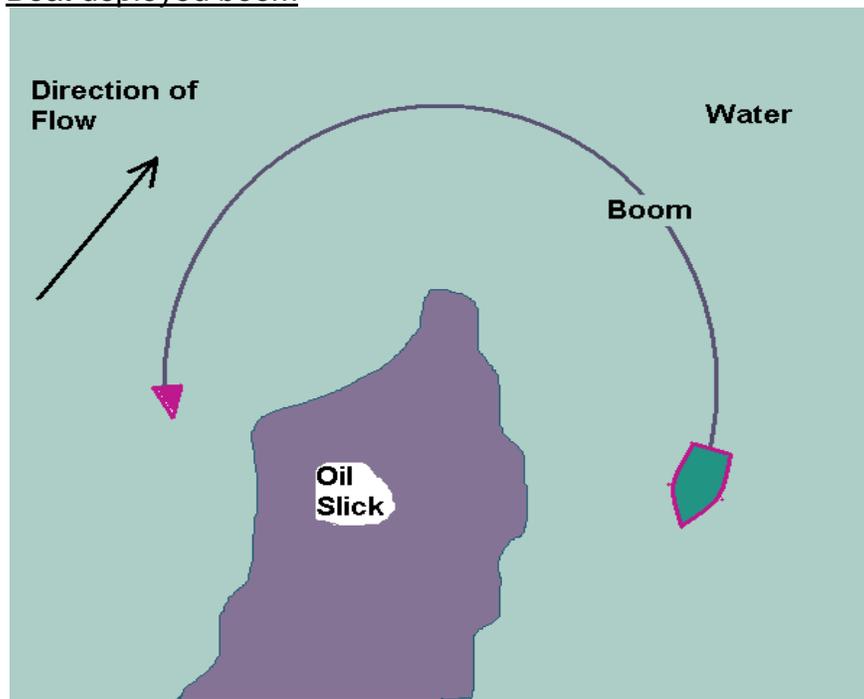


Figure 11- If the slick can be surrounded and isolated from the shore then beach cleaning can be avoided.

## **Barrel Containment**

If liquid is leaking from a barrel, the leak may be stopped by plugging the leak or by rolling the barrel over so the hole is on top. A leak may be plugged with wooden wedges wrapped with a cloth, covered with heavy duty tape, or with an inner tube placed over the leak and tightened with a rod or stick. All of these methods are to be used as temporary seals only. The liquid needs to be transferred into a new barrel or storage tank to prevent further contamination.

## **Recovery**

Fuel recovery methods generally include direct suction, mechanical removal and the use of sorbent material. Uses of sorbent pads serve the most common spill recoveries. A water spray mist may also be used to herd the fuel to an area for collection.

## **Direct Suction Equipment and Techniques**

Direct suction methods include the use of vacuum trucks, portable pumps or shop vacuums. Vacuum or portable pumps can be used to directly recover materials from damaged containers or from thick slicks on water.

Shop vacuums are suitable for small spills if a power source is available. Commercial skimmers are available for attachment to vacuum hoses. These skimmers serve to “skim” floating product from the water surface while reducing the amount of water recovered. Suction screens may be required to prevent hose plugging by floating debris and to prevent pump damage.

Care should also be taken to prevent the uptake of water in order to minimize the final volume of material which requires disposal and to prevent emulsification of oil and water. Once removed from the water body, however, water and oil can be separated using gravity separation. Valves on vacuum trucks can be used for water/oil separation or a drum separator may be readily constructed using a 45 gallon drum and hardware.

Oil soaked sand may be separated by adding water to contained sand. Much of the oil will float to the surface of the water and can be separated more easily.

**CAUTION: All containers used for the recovery of fuel must be grounded because of the potential for static-electricity build-up and fire.**

## **Manual and Mechanical Recovery**

Manual recovery by use of hand tools (cans, buckets, shovels, rakes) is an effective means of recovering fuel from small spills or from areas that are inaccessible to larger equipment. This is often the only method available, and in some cases preferred as it causes the least amount of damage to the area.

Mechanical recovery using heavy construction equipment can be used in some cases for recovery and loading of material for disposal. Caution must be used when operating such equipment around a spill site. In some instances, more damage could be produced from the operation of the equipment than from the spilled fuel. Escaping petroleum vapours may also be present and pose the danger of explosion and fire.

## **Sorbent Material**

Sorbents are materials that soak up oil either by ***absorption*** or ***adsorption***. They are commonly used for final cleanup and recovery of small amounts of oil or to remove oil in places that are inaccessible to other means of recovery. They are effective in recovering thin as well as thick layers of oil; however, large volumes of sorbent are often required.

Sorption reactions generally happen over a short amount of time, however if the adsorbed contaminant begins to be incorporated into the structure of the sorbent, a slow occurring reaction known as absorption begins to take place. To be more precise, the difference between adsorption and absorption is that adsorption is the attraction between the outer surface of a solid particle and a contaminant, whereas absorption is the uptake of the contaminant into the physical structure of the solid.

Snow and soil can be used as effective sorbent materials. When mixed, the oil in snow or oil in soil mixture can be shoveled or picked up using construction equipment and taken to a suitable disposal site.

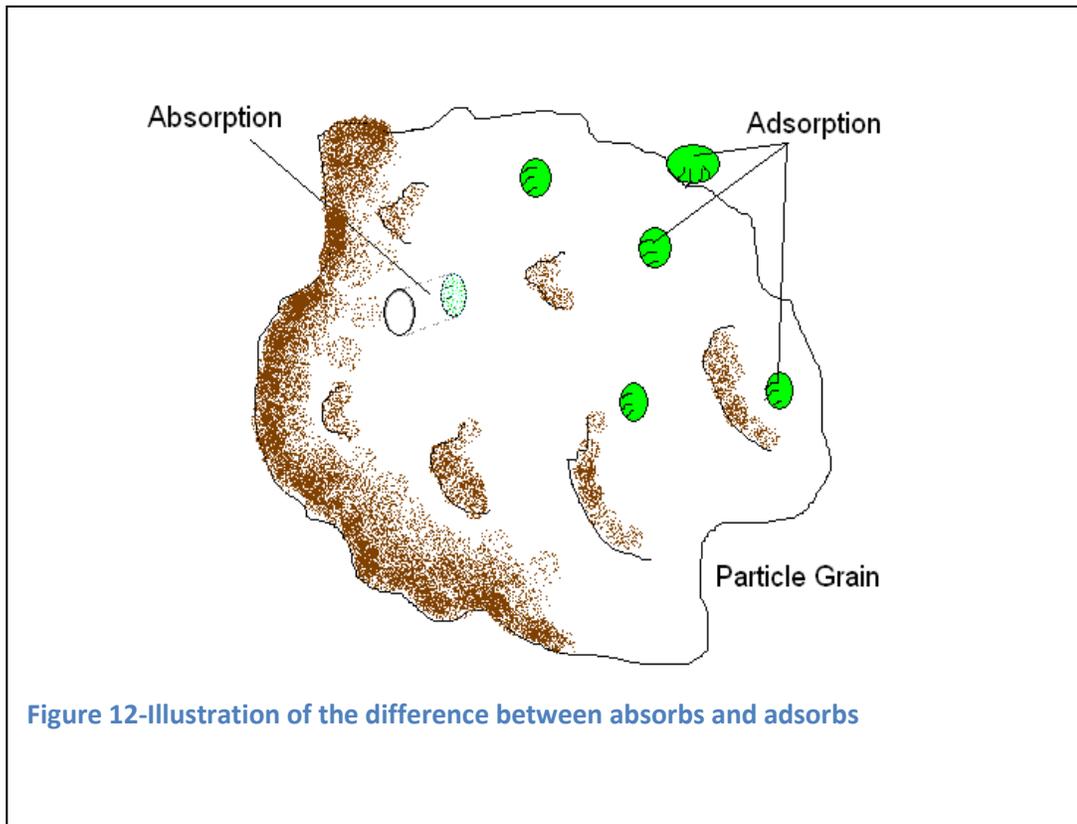


Figure 12-Illustration of the difference between absorbs and adsorbs

## Storage

### Storage is required:

1. if a suitable location for disposal cannot be found
2. if climatic conditions do not permit disposal at the time of cleanup
3. if the selection of a disposal option requires further assessment or
4. if transportation to a disposal/destruction facility is dependent on the availability of a suitable transportation vehicle.

Storage options generally consist of containers, barrels, drums, tanks or pits. The specific type of storage needed is dependent on the volume of recovered material, the degree of contamination with water and soil, the properties of the spill material, and the duration of storage required.

### Vehicle Storage

Vehicles suited for the storage of recovered fuel are tank trucks, vacuum trucks, dump trucks, flatbed trucks, trailer or sled-mounted tanks, and transport trailers. Tank trucks may be used to separate oil and water by emptying the water from the bottom of the tank. Tank trucks typically have capacities ranging from 7.8 to 24.6 m<sup>3</sup>, while vacuum trucks typically hold 3.8 to 17.0 m<sup>3</sup>.

Flatbed trucks and transport trailers are suitable for carrying 45-gallon drums and barrels.

### Open-Topped Tanks

Open-topped tanks such as plastic lined swimming pools may be quickly assembled on firm, level ground. The capacities range from 1 to 20 m<sup>3</sup>. They may be fed by several hoses at once and can store liquids and solid debris. These should be used only for short-term storage when storing fuel.

### Drums and Barrels

Tanks, drums and barrels, which are available in all communities, may be used for temporary storage of fuel.

## Disposal

Disposal or destruction of recovered fuel is needed to eliminate the risk of further contamination from the recovered fuel. No decision, except under emergency conditions, should be made until approval has been obtained from appropriate government agencies. The 24-hour Spill Report Line should be used to initiate such requests and a follow-up report should describe the disposal method used.

### Salvage and Recycle

Recovered diesel and lubricating oil may be reused directly as a low-grade heating fuel.

### Fuel Burning

In some areas, burning of contaminated fuel may be a practical and acceptable disposal technique. Burning of fuel requires **prior approval** and advice from appropriate regulatory agencies. Fuel must not be ignited unless all personnel and equipment are a safe distance from the area.

Fuel on frozen water bodies can be burned using mass burning techniques. The residue and oil not burned can then be scooped up using scrapers, dozers, dump trucks, and finally with brooms and shovels and loaded into trucks.

Burning can also be considered when fuel penetration has been prevented because of frozen or compacted mineral soil or when the water table is at the surface. Residue can be removed the same way as on ice, but great care must be taken to protect area vegetation.

The worst areas to consider burning is where islands of vegetation exist or where the surface has a moss cover into which the oil has penetrated to more than eight or ten centimeters.

## **Final Clean-Up and Restoration**

### **Natural Assimilation (Biodegradation) and Re-vegetation**

Oil can be degraded naturally by micro-organisms under proper conditions of temperature and nutrients. Tilling the affected soil to increase the exposure of the soil organisms and oil to oxygen can also be beneficial. The utilization of natural assimilation to treat, in whole or in part, soils affected by spilled oils requires approval of government agencies.

### **Replacement of Soil**

The grass on the upper layer of soil may have to be removed if these have been contaminated with oil or chemicals. When contaminated material is being removed, regulatory agencies should be contacted in regard to acceptable disposal sites. In some instances, it will be necessary to replace contaminated soil with clean soil. Sensitive areas in the tundra should be left untouched.

Equipment for the removal of contaminated soil includes front-end loaders and small dozers.

## **LAND BASED RESPONSE**

### **Scope and Purpose of Plan**

This plan deals specifically with the preparation and response to a spill that could occur during the unloading of product from a fuel transport truck or holding tank while at the Facility. This Spill Contingency Plan (SCP) is not intended to replace or supersede Emergency Response Plans currently in place, but to provide specific guidance on procedures, training and response for local land spills. This plan will demonstrate the Facility has an effective response capability.

This plan is meant to be a working document for use by the Facility. The fundamental basis for planning will be established utilizing the development of a scenario for the class of product handled at the Facility.

### **Background**

The Facility handles Distillate. The Facility personnel are familiar with the hazards associated with the products they are handling and have on hand, the appropriate Material Safety Data Sheets.

The Facility generally receives fuel transport trucks that can carry up to 5,000 liters of product. Diesel fuel is usually transported in this manner. All other fluids are contained in 45 gallon drums. Any spillage outside of the containment berm would require rapid deployment of any containment method.

### **Product Knowledge**

The Facility ensures that representative and up to date Material Safety Data Sheets are kept on site. Personnel are trained in and understand the properties of products being handled at the Facility. Products with a flash point greater than 38 degrees C include furnace oil, diesel fuel and most jet fuels. Flash point is the minimum temperature at which flame can propagate through vapour of a combustible material to the liquid surface.

### **Preparation**

Prior to fuel transfer at the Facility, the staff will do the following:  
Make sure access to the storage tanks is readily accessible;  
Inventory the environmental emergency equipment; and  
Make ready environmental emergency equipment.

## **Truck to Tank Fuel Transfer Procedures**

Whenever fuel is transferred from a truck to a live storage tank (90,000L or less) the following procedures must be followed:

- Walk the line from the truck fill point to the open fill valve at the tank.
- Ensure the valve at the fill point is closed; open the fill valve at the tank.
- Inspect the tank vent line, ensure there are no blockages.
- Check that the drip tray under the truck fill connection is fully drained and empty.
- Dip the fuel levels and record the readings.
- Determine the amount of fuel in the tank and the amount required to fill it.
- Ensure that the truck static line is properly connected to the fill point piping.
- Ensure that the hose is properly connected to the truck fill point and locked. The truck-fill point and hose connection shall be of the 'Cam lock Quick Coupling' types with a dry disconnect.
- ***\*It is illegal to truck fill the storage tank from the top of the tank due to potential static electricity hazards\****
- Establish visual communication signals by hand with the driver for the start and stop of the pump and make sure you understand each other.
- Open the fill valve at the truck fill point.
- Authorize the truck driver to start pumping.
- During the pumping stage, walk the line to determine if there are any leaks in the filling system under pressure.
- Be in constant communication with the truck driver either visually or by radio at all times.
- Ensure that the tank is filled not more than 18" from the tank top to allow for volume expansion, or until the high level alarm is sounded if the tank is so equipped.
- Signal the truck driver to stop pumping.
- Shut off the truck fill point valve and the tank fill valve.
- Ensure that the EC-00000xxx number of your fuel system is recorded on the fuel delivery slip.
- Sign the fuel delivery slip for the fuel received and obtain a copy.
- Remove the static line.
- Empty the drip tray and clean it out.
- Dip the fuel and record (closing).
- Close the gauging hatch.
- Carry out the final inspection of the tank and the fuel pipe line. Ensure the proper valves are open and closed.

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