Working Responsibly at BHP Billiton: Our Health, Safety, Environment and Community Policy.

At BHP Billiton,we are committed to sustainable development.Health,safety, environment and community responsibilities are integral to the way we do business.
We commit to continual improvement in our performance,ef .cient use of natural resources and aspire to zero harm to people and the environment.
Wherever we operate we will:
Develop,implement and maintain management systems for health,safety,environment and the community that are consistent with internationally recognised standards and enable us to:
identify,assess and manage risks to employees,contractors,the environment and communities;
Strive to achieve leading industry practice;
Meet and,where appropriate,exceed applicable legal requirements;
Set and achieve targets that include reducing and preventing pollution;
Develop our people and provide resources to meet our targets;
support the fundamental human rights of employees,contractors and the communities in which we operate;
Respect the traditional rights of indigenous people;
Care for the environment and value cultural heritage;and
Advise on the responsible use of our products.
Seek opportunities to share our success by:
Working with communities to contribute to social infrastructure needs through the development and use of appropriate skills and technologies;and
Developing partnerships that focus on creating sustainable value for everyone.
Communicate with,and engage,employees,contractors,business partners,suppliers, customers,visitors and communities to:
Build relationships based on honesty,openness,mutual trust and involvement;and
Share responsibility for meeting the requirements of this policy.
We will review regularly and report publicly our progress and ensure this policy remains relevant to the needs of our stakeholders.We will be successful when we achieve our targets toward our goal of zero harm and are valued by the communities in which we work.

Paul AndersonChief Executive Officer and Managing Director

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Effective Period: June 2006 – June 2007

ACTION PLAN

1. **Report All Spills Immediately**
   APPENDIX B contains Internal and External Phone Numbers and Contact Information.
2. **Clean-Up Spill**
   If safe:
   - Stop the source of the spill;
   - Prevent the spill from entering a watercourse; and
   - Clean-up the spill.
3. **Notify Government Agencies (Appendix B)**
4. **Fill out the Spill Report Form (Appendix H)**

If on site coordinator is not available, contact the GNWT 24-hour spills report hotline immediately at: (867) 920-8130.

Respond Immediately if Safe to Do So:

1. Identify the spilled material.
2. Ensure the safety of yourself and others.
3. Shut off ignition sources - NO SMOKING.
4. Attend to injured.
5. Assess the severity of the spill.
6. Call for assistance.
7. On-Scene Co-ordinator mobilizes Emergency Response Team
8. Keep unnecessary people out of the area.
9. Wear impervious clothing, goggles, gloves.
10. Approach spill from upwind IF SAFE TO DO SO.
11. Stop product flow if possible.
12. Contain and recover spill as soon as possible.

Respond Safely

1. Do not contain gasoline/aviation fuel if vapours might ignite.
2. Allow gasoline or aviation fuel spills to evaporate.
3. See the Spill Response Actions on the following pages and Appendix C - Product Guides for further information.

Obtain and report Spill Details

1. Fill in Spill Report Form (Appendix H)

2. All spills must be reported to the GNWT 24-hour Spill Report Hotline: (867) 920-8130.

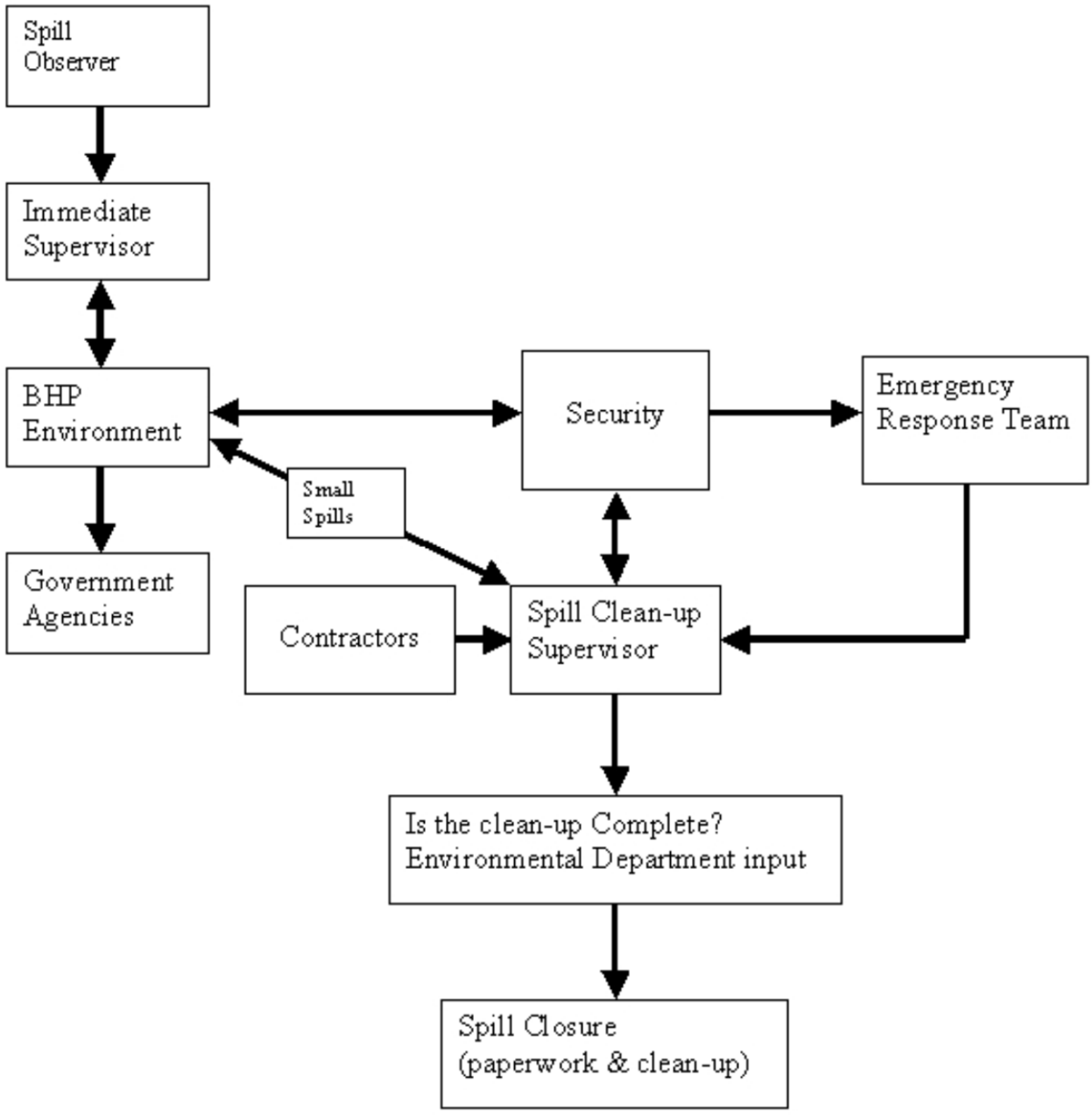


Figure 1. Spill Response Procedure

Spill Response Actions
Diesel, Hydraulic, Lube and Waste Oil

Consider action only if safety permits!

Eliminate ignition sources.
Stop source if safe to do so.

On Land
Do not flush into ditches or drainage systems.
Block entry into waterways and contain with earth or other barrier(s).
Remove small spills with sorbent pads.
On tundra use peat moss and leave in place to degrade, if practical.

On Snow & Ice
Block entry into waterways and contain with snow or other barrier
Block entry into waterways and contain with snow or other barrier
Remove minor spills with sorbent pads and/or snow.
Use ice augers and pump when feasible to recover diesel under ice.
Slots in ice can be cut over slow moving water to contain oil.
Burn using Tiger Torches if unrecoverable by other methods, feasible and safe to do so.

On Muskeg
Do not deploy personnel and equipment on marsh or vegetation.
Remove pooled oil with sorbent pads and/or skimmer.
Flush with low pressure water to herd oil to collection point.
Burn only in localized areas, e.g., trenches, piles or windrows.
Do not burn if root systems can be damaged (low water table).
Minimize damage caused by equipment and excavation.

On Water
Contain spill as close to release point as possible.
Use spill containment boom to concentrate slicks for recovery.
On small spills, use sorbent pads to pick up contained oil.
On larger spills, obtain and use skimmer on contained slicks.

Rivers & Streams
Prevent entry into water, if possible, by building a berm or trench
Intercept moving slicks in quiet areas using (sorbent) booms.
Do not use sorbent booms/pads in fast currents and turbulent water.

Storage & Transfer
Store closed labeled containers outside away from flammable items
Electrically ground containers and vehicles during transfer to designated disposal/treatment area

Disposal
Segregate waste types.
Place contaminated materials into marked containers.
Consult BHPB HSEC Coordinator on any post spill requirements.

Spill Response Actions
Gasoline and Jet B Aviation Fuel

Consider action only if safety permits!

Gasoline and Jet B form vapours that can ignite and explode!
No smoking!

Eliminate ignition sources.
Stop source if safe to do so.

On Land
Block entry into waterways by diking with earth or other barrier.
Do not contain spill if there is any chance of igniting vapours.
On shop floors and in work/depot yards, apply particulate sorbents.
On tundra use peat moss and leave to degrade if feasible to do so.

On Snow & Ice
Block entry into waterways by diking with snow or other barrier(s).
Do not contain spill if there is any chance of igniting vapours.
In work/depot yards, apply particulate sorbents.

On Muskeg
Remove pooled gasoline or Jet B with pumps, if safe to do so.
Do not deploy personnel and equipment on marsh or vegetation.
Low pressure flushing can be tried to disperse small spills.
Burn **carefully** only in localized areas, e.g., trenches, piles or windrows.
Do not burn if root systems can be damaged (low water table).
Minimize damage caused by equipment and excavation.

On Water
Do not attempt to contain or remove spills.
Use booms to protect water intakes and sensitive areas.

Storage & Transfer
Store closed labeled containers in cool ventilated areas away from incompatible materials
Electrically ground containers and vehicles during transfer to designated disposal/treatment area.

Disposal
Segregate waste types, if necessary.
Place contaminated materials into marked containers.
Consult BHPB HSEC Coordinator on any post spill requirements.

Spill Response Actions
Acetylene and Propane

Consider action only if safety permits!

Gases stored in cylinders can explode when ignited!

Keep vehicles away from accident area.

Refer to Product Guide in Contingency Plan for:

Physical/Chemical Properties
Response to Fires
First Aid

- Vapours cannot be contained when released.
- Water spray can be used to knock down vapours if there is NO chance of ignition.
- Small fires can be extinguished with dry chemical or CO_2.
- Personnel should withdraw immediately from area unless a small leak is stopped immediately after it has been detected.
- If tanks are damaged, gas should be allowed to disperse and no attempt at recovery should be made.
- Personnel should avoid touching release point on containers since frost quickly forms.
- Keep away from tank ends.

Spill Response Actions
Raw Sewage

Consider action only if safety permits!

On Land
Block entry into waterways.
Do not flush into ditches or drainage systems.
Contain spill by diking with earth or other barrier.
Remove spills with pumps or vacuum equipment.
On tundra, use peat moss and leave in place to degrade, if feasible.

On Snow & Ice
Block entry into waterways.
Do not flush into ditches or drainage systems.
Contain spill by diking with snow or other barrier.
Remove contaminated snow with shovels or mechanical equipment.

On Muskeg
Do not deploy personnel and equipment on marsh or vegetation.
Remove pooled sewage with pumps or vacuum equipment.
Leave in place if more damage will result from cleanup.
Minimize damage caused by equipment and personnel.

On Water
Sewage sinks and mixes with water.
Isolate/confine spill by damming or diversion.
If not possible to confine and pump, disperse using water flushing.

Storage & Transfer
Store closed labeled containers in cool, ventilated areas.
Avoid contact with collected material.

Disposal
Consider using as a fertilizer in designated areas.
Place into marked containers.
Transport to the designated sewage treatment plant.
Consult BHPB HSEC Coordinator on any post spill requirements.

5.0 RESPONSIBILITY

All Employees (First Observer)

- Assess the initial severity of the spill and safety concerns.
- Identify the source of the spill.
- Report all spills to Work Supervisor as soon as possible.
- Determine the size of the spill and stop or contain it, if possible.
- Participate in spill response as member of cleanup crew.

Work Supervisors

- Contact the BHP Billiton Project Geologist and/or Site Manager.
- Gather facts of the spill.
- Start to prepare a spill report form (Appendix H).
- Assist as required in spill response measures.

Spill Clean-Up Crew

- Conduct cleanup of spills under direction of Project Geologist/Site Manager.
- Deploy booms, sorbents and other equipment and materials as required.
- Take appropriate response measures.
- Continue cleanup as directed by Project Geologist/Site Manager or until relieved.

Project Geologist/Site Manager

- Assist in initial and ongoing response efforts.
- Supervise emergency spill clean-up crew.
- With work crew, take initial action to seal off the source and contain spill.
- Records the time of the report, source of information and details on location, size, type of spill and any other information available on the spill report form.
- Oversees the cleanup operation until it is satisfactorily completed.
- Determine need for equipment and personnel to contain and clean-up spill.
- Ensure co-ordination of equipment and manpower as needed (BHP and contractors).
- Continue actions until relieved or supplemented by other Emergency Supervisor.
- For spills into water, ensure that booms, sorbents, and other material as required are placed in watercourses to contain spill.
- Decide with On-Scene Co-ordinator if mobilization of additional equipment from Spill Response Organization or Contractor is warranted.
- Assess whether burning is a viable clean up measure. Consult with HSEC Coordinator.

Project Geologist

- Ensure expeditious response and clean up of spill site and impacted areas.
- Complete the Spill Report Form (Appendix H) and submit to the NAE – HSEC Coordinator.
- Report the Spill to the GNWT 24-Hour Spill Report Line at (867) 920-8130.

NAE – HSEC Coordinator

- Follow up to ensure that the spill was reported to the GNWT 24-Hour Spill Report Line at (867) 920-8130.
- Together with the Project Geologist/Site Manager, decides if additional equipment is required to contain and clean up spills.
- Notifies NAE Operations Manager and Global Operations Leader.
- Oversees completion and distribution of Spill Report.
- Ensures investigation identifies measures to prevent similar spills.

Vice-President Exploration

- Is responsible for all communication with the media. Ensures that all press releases are accurate and in accordance with company policy.
- Makes financial decisions on major expenses during large spill response.
- Initiates Mutual Aid Agreements if so required.

Global HSEC Coordinator

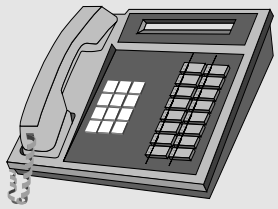
- Provides cleanup advice to the On-Scene Co-ordinator and Spill Cleanup Supervisor.
- Assists the President in the preparation of press releases.
- Develops safe and effective spill management and prevention practices.
- Provides advice to the Spill Cleanup Team Leader of storage and disposal options.
- Updates and distributes Contingency Plan.
- Ensures that the Environmental Department reports spills to the 24hr Spill Line and obtains confirmation of receipt of spill report.
- Ensures that there is follow up reports prepared on the spill event, clean up and environmental impacts.
- Ensures that Post-Spill reports are completed and takes action, as necessary, to prevent a recurrence.
- Ensures Emergency Response Team is adequately trained in spill response.
- Organizes spill response training and exercises.
- Liase with government agencies (as required).

Legal Counsel

- Advises the President and the Environmental Manager as requested related to:
- Legislative authority of various government agencies.
- Questions of due diligence.
- Costs/fines and liabilities, including penalties associated with regulations.
- Consults with the corporate insurance co-ordinator and advises the President on matters related to insurance.

BHP Board of Directors

- Establishes corporate environmental policy based on the recommendations of the Environmental Management Committee.



External Contacts

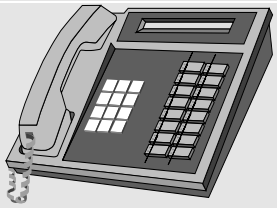
CONTACT THE FOLLOWING NUMBER IMMEDIATELY:

NWT/NU 24-HOUR SPILL REPORT LINE 1 (867) 920-8130
FAX (867)-873-6924

OTHER CONTACTS	PHONE
NUNAVUT	
Qikiqtani Inuit Association	867 979-5391
Nunavut Water Board	867 360-6338
Nunavut Impact Review Board	867 983-2594
Indian and Northern Affairs Canada, Iqaluit	613 238-1096
RCMP, Hall Beach	(867) 928-1111
RCMP Clyde River	867 924-1111
GNWT	
Harvey Gaukel, Hazardous Materials Specialist Environmental Protection Service, GNWT, RWED	(867) 873-7654
Sylvester Wong, Director Prevention Services, WCB	(867) 669-4408
Larry Adamson, Regional Superintendent, RWED	(867) 920-6134
Bruce Stebbing, Office of the Fire Marshall, GNWT, MACA	(867) 873-7030
Spill Report Line	Ph:867 920-8130 Fax: 867 873-6924
FEDERAL GOVERNMENT	
Spencer Dewar, Lands Manager DIAND	867 975-4295
Darren Unrau, Resource Management Officer (DIAND)	(867) 669-2763
David Milburn, Regional Manager, Water Resources Division (DIAND) DIAND Water Resources Inspector	(867) 669-2650 867 975-4298
Craig Broome, Environmental Protection Branch, Environment Canada	(867) 669-4730
Ron Allen, Manager, Fisheries and Oceans Canada	(867) 669-4902
LOCAL AIR CHARTER	
Calm Air, Churchill	(204) 675-8843
First Air	(867) 979-8302
Kenn Borek Air	(867) 979-0040

OTHER CONTACTS	PHONE
SORBENTS	
Western/Westlund Frontier Mining (sorb pads & spill supplies)	(867) 920-7617
Acklands-Grainger Inc. (sorb pads & spill supplies)	(867) 873-4100

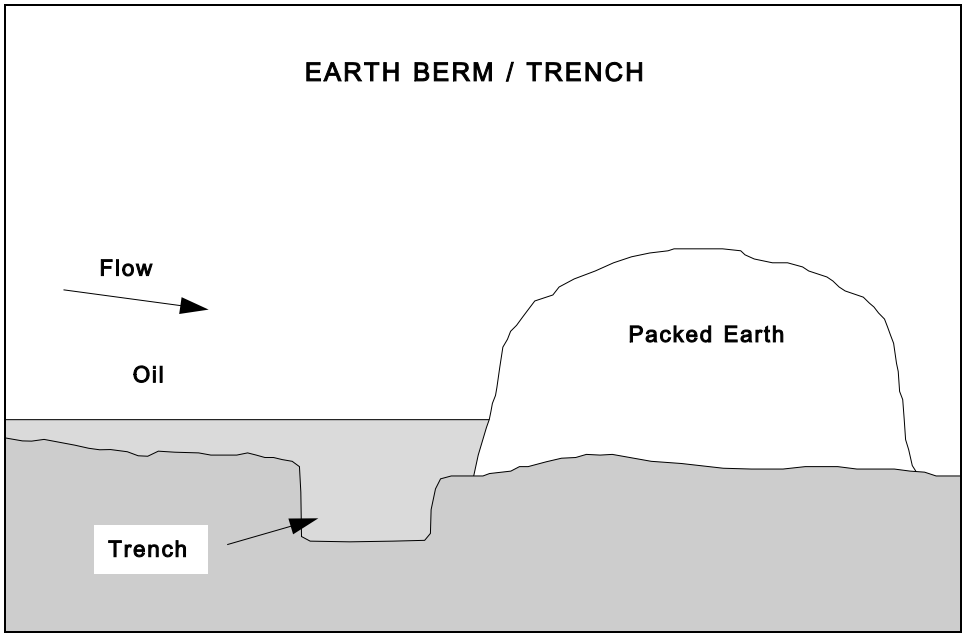
Internal Contacts



TITLE	NAME	PHONE	FAX
First Contact	Gerald Olsen Project technician	Vancouver office: 604 632-1523	Vancouver office: 604-683-4125
NAE – HSEC Coordinator	Martin Lenters	604 632-1454 Cell 604 726-6087	604 683-4125
Vancouver Regional Manager	Geoff Woad 4095 Marine Dr West Vancouver, BC V7V 1N7	604 632-1482 Cell 604716-4618	604 683-4125
World Exploration Vice President	Ian Maxwell Melbourne, Australia	011 61 3 9609 4260	

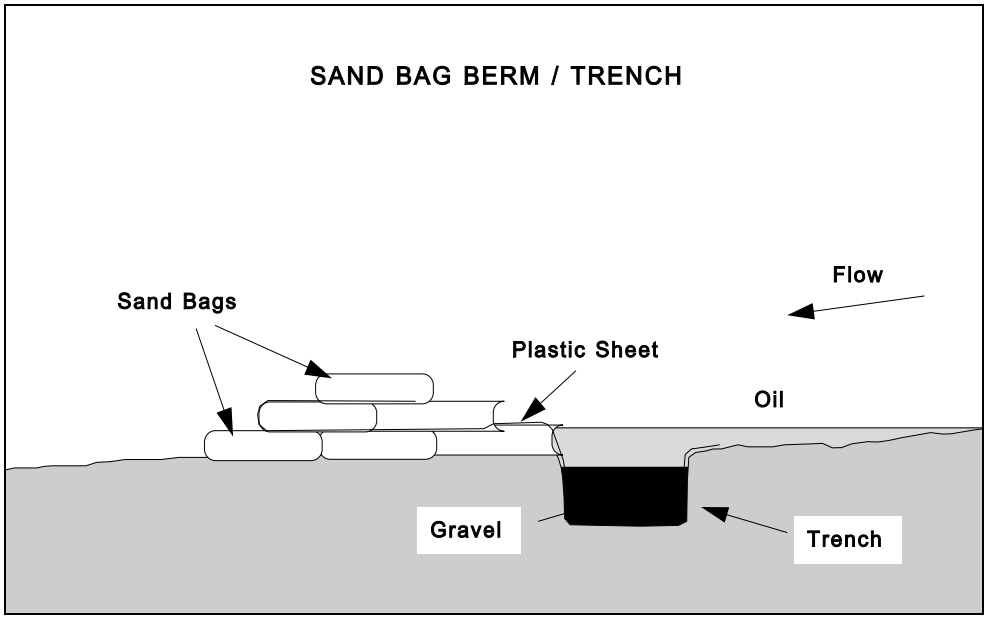
Earth Berm/Trench

If possible, locate the berm/trench sufficiently downslope of the release point to complete its construction before the spill arrives. Dig the trench along a natural drainage contour. It should be approximately 0.5 m deep with a relatively flat bottom. The excavated material can then be combined with other available material to build a berm.

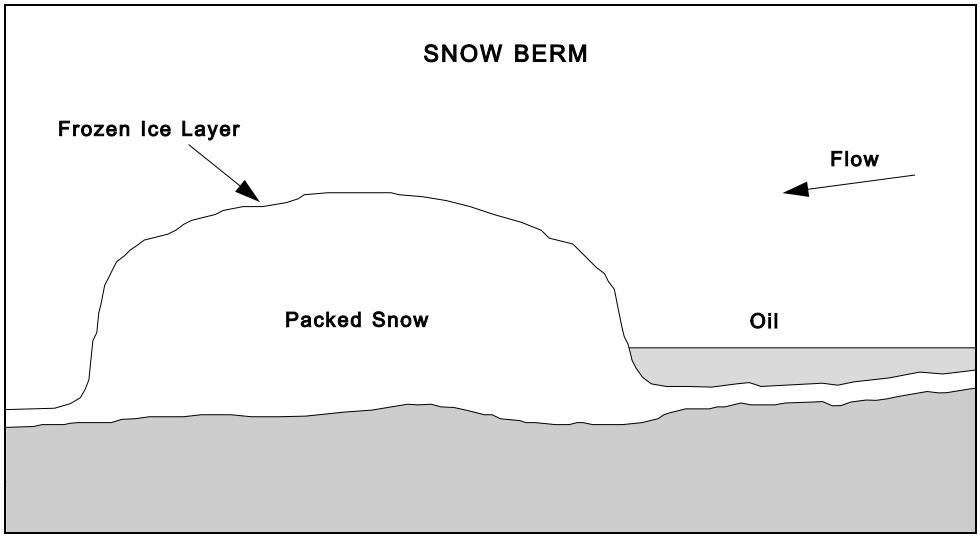


Sand Bag Berm/Trench

Sand bags can be used where available and if the earth is too hard or frozen and cannot be excavated or compacted. ***A plastic liner*** can be used to seal the trench and bags and should be anchored with gravel or rocks and be woven between layers of bags.



Snow Berm
In winter conditions, snow may provide a quick and efficient berm construction material. The snow should be well packed and water can be sprayed to form an ice layer on the top and sides of the berm to make it impermeable to the spill.



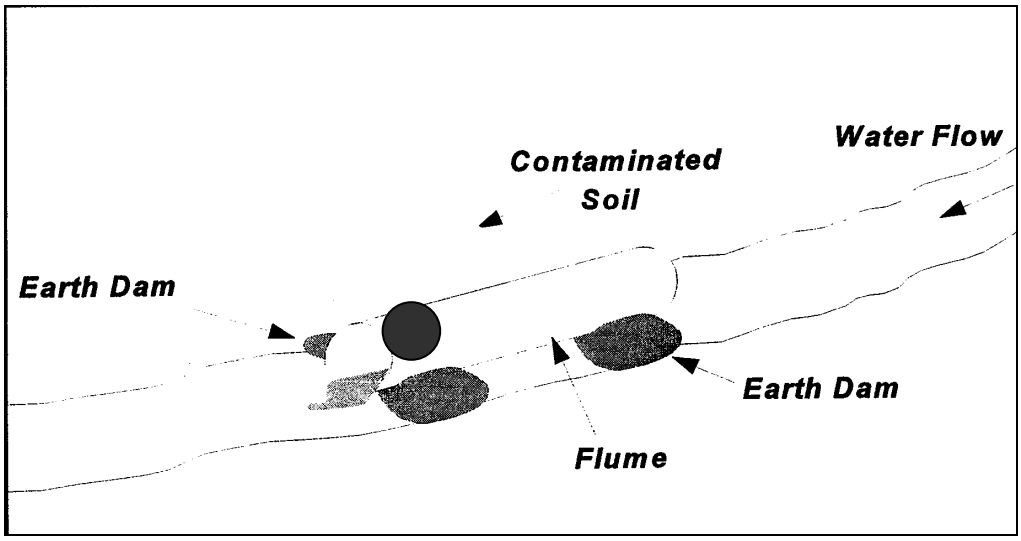
The type and size of the containment method chosen will depend on the following factors:

Size of Spill
Berms surrounding large spills that cover extensive areas are difficult and time-consuming to build. For this reason, earth or snow berms may be more easily put into place than sandbags. It is also important to build the berm as close to the source as possible to minimize spreading.

Terrain
Steep terrain can increase work difficulty, particularly with heavy equipment, while large flat areas will require longer barriers to contain a spill. Spills will also travel much faster on steep inclines but move more slowly and tend to pool on flat ground, allowing more time for the construction of barriers.

Soil Type
Some oils and chemicals will soak into loose, coarse, or dry soils while packed or frozen soil can create a natural barrier. The void space in tundra quickly takes up spills. Frozen soil will also require relatively heavy machinery in order to build a trench or berm. Soft, wet soil can also impede vehicle and machinery access.

Proximity to Water
It is important that every precaution be taken to ensure that spills do not enter a waterway. If there is any possibility of contamination, a stream or river should be protected with a berm or flume as shown below.



Weather
Weather can play an important role in spill response operations, particularly if the ground is frozen or if rainfall is heavy or prolonged. Since oil floats on water, any pooled water that collects in a trench or against a berm will effectively increase the volume of liquid needed to be contained. Water can also significantly increase the tendency of oil to spread thus posing a substantial hindrance to effective cleanup. Soluble chemicals are difficult to remove and should be assessed for their impacts on an individual basis.

Location
The location of a spill determines the most feasible type of containment. Accessibility of both equipment and manpower could be hindered by difficult terrain or dense vegetation. Areas might be required where a helicopter might land as well as one or more designated locations where equipment could be staged for later deployment at strategic locations.

Darkness
Spills during winter in remote locations can be difficult to clean up if they spread or migrate beyond the release point and there is insufficient light to mount a cleanup operation. During summer months, extended days can facilitate response in the North.

Temperature
Air temperatures of the Arctic demand attention by response personnel during both high and low extremes. Heat stress must be avoided by the proper intake of fluids during the summer while temperatures below -20º C necessitate the protection of skin from freezing

SPILLS ON MUSKEG
Muskeg is generally poorly drained, wet and spongy. Internal drainage is usually slow and the depth of peat over mineral soil varies greatly. Muskeg is also highly acidic and low in nutrients, making natural biodegradation very slow, even during the summer months.

It is recommended that small oil spills in muskeg be mixed with peat moss and allowed to degrade during summer months since more damage can be done by attempting cleanup using mechanical removal methods.

It is possible that, due either to safety or the condition of ground (too soft), that cleanup should be delayed until conditions improve. In either case, all parties involved should be consulted in order to determine when and how

cleanup should be undertaken. Site monitoring will also be required during the interim phase in order to ensure that the spill does not spread to any sensitive areas around the contaminated site.

Small Spills

In the event of a small spill, it is important to weigh the advantages of cleanup versus the potential negative impacts on the terrain. Considerable damage can be caused by both personnel and equipment to wet or sensitive areas. In many cases, the best solution may be to add nutrients to the contaminated area and monitor the site to ensure that the spill does not migrate to an adjacent sensitive area. In all cases, BHP's environmental advisor and Regulatory Authorities should be consulted.

Large Spills

Spills involving large quantities of oil or chemicals into muskeg pose a serious threat and should be approached with caution. Possible containment and recovery methods for winter and summer spills, including the different possible scenarios, are discussed for:

- large spills on bogs
- large spills on fens
- large spills on marshes

F2 Spills On Water

Containing spills on water is often difficult because oil quickly spreads. In turbulent water, oil and chemicals are likely to mix into the water column, making recovery impractical. For these reasons, it is important that if a spill reaches water, that containment be attempted as close to the source as possible, and that the spill be prevented from reaching a flowing stream. Spills in lakes should be contained, if possible, before reaching outlets where containment and recovery can be both difficult and dangerous. Efforts to contain spills in large streams should be limited to land-based operations where the oil might pool in accessible back eddies. The recovery of water soluble chemicals is not possible.

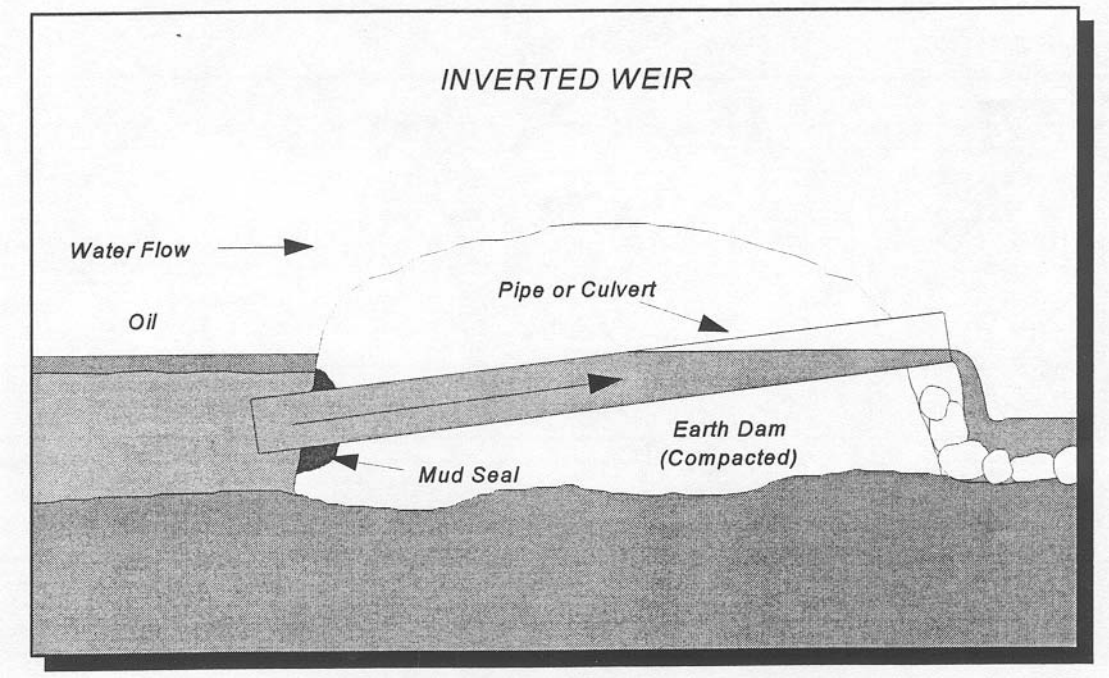
In flowing streams, oil travels at the same speed as the surface current. On larger rivers or in open lake areas, slicks are also transported at 3.5% of the wind speed. Although a comparatively small effect, it can be an important factor if the wind is at right angles to the water flow and if the water surface involved is extensive. The wind can force the spill to the sides of the river where flows are slower or to the shore of a lake. Long reaches of the river may become contaminated although containment and recovery might also be possible.

In smaller streams, the wind will have less impact and the slick speed can be easily estimated by placing a small stick in the middle of the stream and determining the length of time required for it to travel a given distance, typically 10 m. This information can be quickly converted to speed (36 / time (sec) = ***x*** km/h) to determine the estimated travel time to a confluence or other sensitive area.

Containment Strategies
Determining the best possible strategy for containment will depend on a number of factors:

- speed of slick travel
- location of possible containment sites
- availability of personnel and equipment
- location of sensitive areas
- safety of operations

Spills on water can be contained by using floating booms (sorbent or non-sorbent) or by constructing a temporary berm and inverted weir. The objective is to build a barrier against which the (normally floating) oil will pool while allowing the underflow of water.

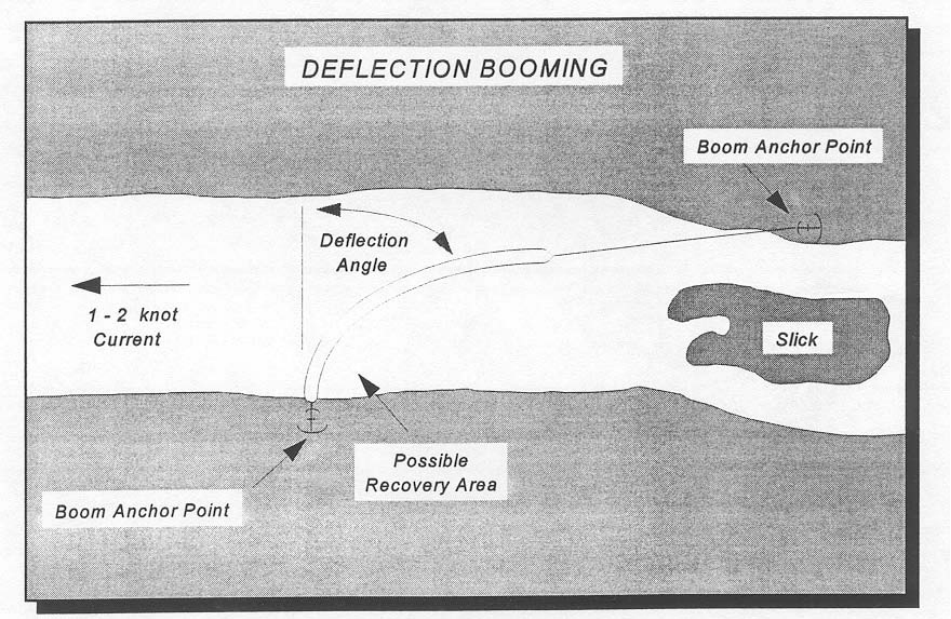


IMPORTANT ☐	Whenever the construction of a berm or flume is considered as part of a spill response operation, the impacts of the disturbance must be weighed against the potential impacts of the uncontained spill. Care must be taken to minimize any adverse effects. The Federal Department of Fisheries and Oceans should be consulted if fish spawning streams are involved. (Phone (867) 669-4902)

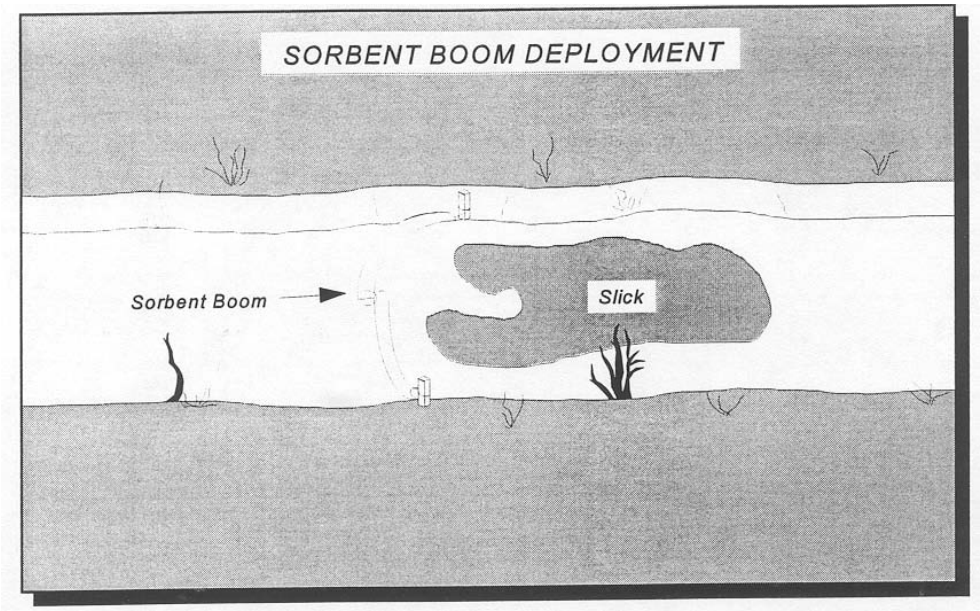
Barriers can be constructed from earth or rocks although if large rocks are used, plastic sheets or packed mud should be used to ensure that a complete seal is made. Choosing and positioning the pipe is critical to effective operation of the weir. The pipe should be low enough at the inlet end to ensure that an increase of the slick thickness or substantial lowering of the water will not result in a loss of oil through the pipe. Larger pipes which allow greater volume (and slower) flows will minimize the tendency of the oil to become entrained in the water at the inlet side. The outlet end of the pipe should be positioned to create a continuous, smooth flow. Underflow of oil (under the pipe) should also be prevented by ensuring that the pipe inlet is not located on loose gravel.

Booms

Booming with either sorbent or non-sorbent booms can also be an effective means of containing spills on slow-moving waters and in lakes. Effective containment using conventional booming techniques will be very difficult in streams or rivers where currents exceed 0.7 knots (0.4 m/s). At these speeds, oil will become entrained in the water flowing under the boom resulting in significant losses. Some improvement can be achieved in waters flowing at 1- 2 knots (0.5 - 1 m/s) if the boom is deployed at an angle of less than 90^{o} to the direction of flow as shown below:



Sordent booms or socks can also be used to provide a barrier to floating oil. These types of booms should be checked regularly to ensure that they do not become saturated with either water or oil since they will tend to float very low in the water or even sink and release oil downstream.



F3 Spills In Ice And Snow

Oil can remain relatively fresh, i.e., in an unweathered state, under snow and ice for several months or more after a spill. Evaporation rates will still be high when the oil is ultimately exposed to atmosphere except in very low temperatures approaching its flash point. Oil can also move up and down small hills (several metres high) due to the capillary action of the snow.

Containment

Snow and ice can be used to create berms to keep spills from spreading. In frozen rivers, angled slots about 1 m wide or holes can be cut in the ice, where safety permits, to allow possible spill recovery. The oil will rise up into the openings where it will concentrate, and be available for recovery using skimmers or pumps.

Disposal

Oil spills in snow and ice can sometimes be burned if the spill can be isolated from the source. Although there is generally a reduced fire hazard, due attention to safety of operations is still required. If burning is not effective, recovered contaminated material will need to be collected and transported to a designated disposal/treatment facility
(Reference BHP Waste Management Plan).

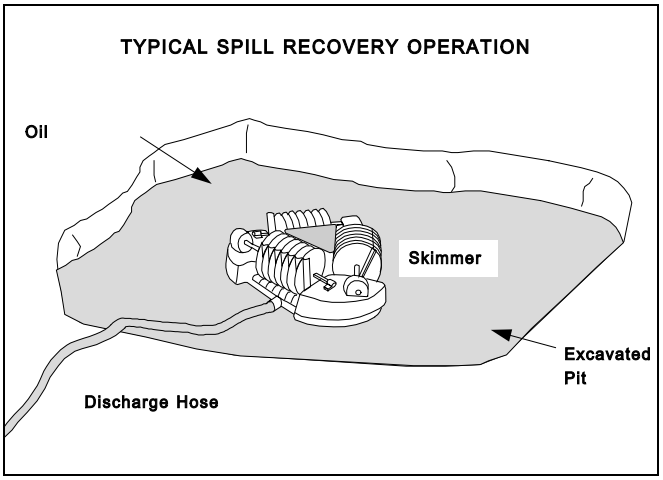
RECOVERY

When large volumes of oil have been contained either through natural or mechanical containment, it will be necessary to remove or recover the accumulated oil. This will generally occur in excavated trenches or adjacent to berms or natural barriers and occasionally in slow running streams or quiet ponds.

Vacuum trucks are ideal at cleanup sites accessible by road and where a large volume of oil has pooled that is generally free of water. The truck must be positioned at a safe distance so that there is no possibility of fire or explosion.

Oleophilic devices, such as disc or drum skimmers, can selectively recover oil in water, and are better suited to applications where the oil has formed a distinct layer on top of quiet water. Accumulations adjacent to an inverted weir are an example. A vacuum truck would be largely ineffective in this instance since it would recover large amounts of water, particularly in a thin layer of oil with water flowing through the pipe or culvert.

An example of a disc skimmer application in an excavated pit is shown in this appendix.



When using disc or drum skimmers, ensure that small items of debris are periodically removed from scrapers to ensure their efficient operation.

TRANSFER

Pumps can be used to transfer oil recovered by a skimmer to temporary and/or final storage facilities. Pumps can also be used for low-pressure flushing of contaminated areas, although this spill response technique should only be carried out under the guidance of an environmental advisor. BHP personnel should be familiar with the operation and maintenance of available transfer equipment:

- Centrifugal ("trash") pumps are capable of moving oil but will emulsify oil and water, resulting in the generation of larger volumes of liquid waste.
- Peristaltic, diaphragm and other positive displacement type pumps tend to reduce oil/water emulsification.
- Ensure that pumps and drives selected for transferring Jet-B, gasoline or other flammable products are explosion proof.

Solid wastes, such as contaminated sediment, used sorbent, spent boom and other debris, will require the use of rakes and shovels for initial pickup and then lined containers, pickup trucks, etc. for their transfer to disposal sites. Care should be taken during such operations to prevent the contamination of soil and water at transfer points.

F4 Cleaning Stream Banks, Shoreline & Muskeg

Site restoration, stream banks and general "shoreline" cleanup of lakes are the final spill response steps. Due to seasonal variations and various types of stream banks and muskeg, a standard restoration program cannot be prescribed. Consultation with environmental advisors is critical to ensuring cleanup efforts do not create adverse impacts. General cleanup rules include:

1. **Minimize** the impact to shoreline or muskeg, particularly vegetated areas, during all phases of spill response. Cleanup can cause more damage to such habitat than an untreated spill, especially where permafrost and vegetation are involved.

2. **Assess** area requiring cleanup in terms of three factors:

- environmental sensitivity
- property, archaeological or other damage
- natural cleansing action at the site

Oil typically does not adhere to the banks of fast moving rivers. Little or no cleanup action can usually be taken. On the other hand, muskeg can undergo long-term contamination and reduced environmental productivity that cleanup may or may not help to alleviate because of other damage inflicted. Whatever method is chosen to deal with an area affected by a spill, minimizing damage to root systems is vital.

3. **Obtain** approval and instruction prior to conducting cleanup operations.

4. **Be particularly careful if oil has entered marshy areas and wetlands**.

Personnel and equipment should NOT be deployed into such areas without explicit approval from environmental authorities. Damage to both upland and water areas may result.

5. Approach vegetated areas and other sensitive zones from the water side, if possible and if cleanup is to be attempted. Be aware that various plant species, birds, fish and animals can all be adversely affected by cleanup operations. In the Arctic, breeding and blooming periods during the summer months are particularly critical.

BURNING

The *in-situ* burning of spilled oil may be useful option, particularly in the North, where terrain and/or safety concerns may make conventional cleanup methods impractical. It is important that the decision to burn be made as soon as possible after the spill because as the more volatile light ends evaporate, burning becomes more difficult. For this reason, it is recommended that BHP obtain prior approval from the necessary regulatory agencies.

Application

The best results will be achieved when burning fresh (less than 24 hours old) spills in winter or in muskeg with a high water table. Burning can also be effective in containment trenches or ponds where significant oil thicknesses can collect. Special care should be taken in winter conditions as the heat from the burn will melt adjacent snow, increasing the potential for penetration of the oil, and potentially transporting the oil to the surrounding area.

Care must also be exercised during the summer. Natural occurring bog and other plants on the Arctic tundra can burn creating more damage than the original spill. Material for burning should be isolated from the surrounding terrain (in windrows or containers) prior to burning if there is ANY chance of adjacent areas being inadvertently set on fire.

Limitations

The burning of heavy or weathered oil is very difficult or impossible. Severe weather conditions such as high winds, snow and rain may also make burning impossible. Areas with vegetation cover which have not been severely damaged by the oil should not be burned as more damage will result than if the oil is left to degrade naturally. Care should also be taken in muskeg with a relatively low water table as burning may destroy sensitive root systems.

Preventive Measures

Drum Cache Storage

- Choose ground that is sandy or gravely and which is either level or represents a naturally containing depression.
- Wherever practicable, drums should be stored within a containing berm made from snow, gravel, or rocks and lined with fuel-impervious material. The volume of the berm must be equal to or greater than 110% the volume of the largest container.
- Preferably arrange in single tier rows although two tier stacking is permissible in confined sites.
- All bungs must be visible to inspect for leakage. Parallel rows must have walkways between them.
- Place drums so bungs are in the 9:00/3:00 o'clock position. If this cannot be done, it is preferable to have the larger bung topmost as it is more apt to be the source of a leak.
- Badly dented or questionable drums should be used first. In the case of fuels other than turbo, the contents should be pumped into competent containers for future use. Turbo fuel from leaking drums that cannot be immediately used must be pumped into competent drums and *disposed of.*
- Empty drums should never be stored with the bungs down.
- At least 1 – 205 litre comprehensive hydrocarbon spill kit per 300 drums should be supplied at every fuel cache. Additional hydrocarbon absorption pads must be available to resupply all sites.

Inspections

- Drum caches should be inspected every 2 days for indications of leakage.
- Drums connected to heaters or machine driven equipment should be inspected daily.

Fuel Transfer

- Motorised fuel pumps must be never be left running unattended during a transfer procedure.
- Fuel control values and shut-off controls must be tested before refueling to ensure proper function.
- Hydrocarbon spill kits must be immediately available during any refueling procedure.

NWT SPILL REPORT FORM

Acrobat Document

MSDS


I:\HSEC\MSDS Sheets\Aviation Fuel_


I:\HSEC\MSDS Sheets\Gasoline_Dies


I:\HSEC\MSDS Sheets\Gasoline_Unle

GENERAL SITE MAP

Acrobat Document