Environment

Hamlet of Tuktoyaktuk

Municipal Solid Waste Disposal Facility Operation and Maintenance Manual for Existing Landfill Site

Prepared by:

AECOM
18817 Stony Plain Road NW 780 486 7000 tel
Edmonton, AB, Canada T5S 0C2 780 486 7070 fax
www.aecom.com

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60439290 (501)

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1. Introduction

This Operation Manual is for the existing waste disposal facility and will serve to guide in the operations of this facility until it is replaced with the new engineered Municipal Solid Waste (MSW) Disposal Facility located approximately 12 kilometres (km) south of the community.

Water use and waste disposal in the Hamlet of Tuktoyaktuk is regulated by a Type B Water License issued by the Northwest Territories' Inuvialuit Water Board (IWB) as provided in **Appendix A.**

1.1 Objective

This manual has been developed to:

1. Provide the Hamlet of Tuktoyaktuk's with "best management practices" for the operation and maintenance of its existing MSW disposal facility
2. Document these practices for review by the IWB and the community
3. Support the application of an updated water license

1.2 Operating Principles

The facility is to be operated according to the following principles:

- Only approved or authorized waste is accepted
- Wastes are compacted to the greatest practical density
- Wastes are segregated (metal, appliances, tires)
- Hazardous wastes are stored at the municipal yard (batteries, oil, antifreeze, solvents)
- Safe operating practices are followed
- Records are maintained with respect to operations and site development

A contact list for relevant Hamlet personnel may be found in **Appendix B**.

1.3 Operation Policies

Operation Policies were developed to provide specific details related to the operation and maintenance of the facility in general accordance of the requirements of the IWB Water License.

These Policies, presented in **Appendix C** of this manual, cover a wide range of topics; including safety, emergency response, record keeping, list of waste items not accepted, a list of waste items accepted, handling procedures for hazardous waste, litter control, etc. All personnel involved with the operation of the facility must be fully conversant with these Policies.

The Operation Policies may be amended by the Senior Administration Officer (SAO) as required. In case of discrepancies between the content of the manual and the Operation Policies, the Policies shall govern.

1.4 Location of Tuktoyaktuk and Local Infrastructure

The Hamlet of Tuktoyaktuk is situated in the Inuvik Region of the North West Territories (NWT). It is located at 69°27' N latitude and 133°03' W longitude, along the Kugmallit Bay of the Beaufort Sea and west of the Mackenzie River Delta (as shown in **Figure 1-1)**.

Tuktoyaktuk had a population of 935 in 2011 (Northwest Territories Bureau of Statistics, 2011). The population of the Hamlet is concentrated on the small Tuktoyaktuk Peninsula along the eastern shore of Kugmallit Bay.

Tuktoyaktuk's existing MSW facility is located approximately 3 km south of the Hamlet at an elevation of approximately 1 metre (m) above mean sea level (as shown in **Figure 1-2**).

Figure 1-1: Location of Tuktoyaktuk
Modified from original work of Algkalv and Dr. Blofeld, Wikimedia

Figure 1-2: Location of the Hamlet of Tuktoyaktuk Municipal Solid Waste Disposal Facility (AECOM, 2014)

1.5 Geophysical and Climate Information

The Hamlet of Tuktoyaktuk is located approximately 75 km north of the treeline, entirely within the zone of continuous permafrost. The active layer above the permafrost typically begins to thaw once the snow has melted in late May and is generally completely frozen again by the end of November. The active layer varies in thickness from a few centimeters (cm) to a few metres.

The terrain at Tuktoyaktuk is generally covered with an organic mat of peat and tundra vegetation. The landform of the Tuktoyaktuk area is thermokarst topography, which is characterized by an undulated land surface with small depressions and numerous shallow lakes. Most of the Tuktoyaktuk area is below 60 m in elevation. Pingos, massive ground ice, and ice-wedge polygons are common throughout the area.

Soils in the area are mapped as Orthic Turbic Cryosols (ESWG, 1996). Cryosols are permafrost-affected soils which are associated with tundra conditions, and are mineral soils strongly affected by cryoturbation or frost churning that generates various forms of patterned ground.

The climate can be characterized by long cold winters and short cool summers. According to the Environment Canada Climate Normals (ECCCN, 1981-2010) collected from the Tuktoyaktuk Airport's weather station from 1971 to 2010, the annual daily mean temperature was -10.1 degrees Celsius (°C), with a high of -6.4°C and a low of -13.8°C. The average total annual precipitation is 160.7 millimetres (mm); consisting of 103.1 cm of snowfall and 74.9 mm of rainfall. The warmest month on average is July, which has a mean temperature of 11.0°C, a high of 15.1°C and a low of 6.9°C. The coldest month on average is January with a mean temperature of -26.6 °C, a high of -23.0°C and a low of -30.4°C. The coldest temperature on record was -48.9°C on January 13, 1975. The warmest temperature on record was 29.4°C on July 26, 1973 (ECCCN, 1981-2010). The prevailing wind is from the east and northeast with maximum hourly winds recorded during the December to March period (Kiggiak-EBA, 2011).

2. Background

2.1 Facility History

Tuktoyaktuk's landfill site is located approximately 3 km south of the Hamlet along the all-weather road to Reindeer Point. This site has been in operation since the early 1970s. It was developed to replace the original dump located at the end of the community airstrip. The facility covers an area of approximately 20 hectares, although to date only a small portion of the available space has been used. The facility was developed along the shores of a bay of the Beaufort Sea.

Prior to 1984, the MSW disposal area was on the northern side of the current site (now a remediated area); the southern side had limited use as a disposal area. The southwestern side contained a large pile of bulky waste, originally comprising of old cars and metal construction debris. This area was remediated with cover material in 2004.

In 1986 a plan to improve the site conditions was developed, including preparation of an operations and management plan to guide site operations. The plan consisted of filling the site areas prone to tidal action with a layer of compacted debris to an elevation that was above mean sea level and then capping the debris with soil material. Waste was then placed in one area and once a year compacted, covered and graded.

In 1992 the bay was isolated from the ocean by construction of a dyke. Several land masses located offshore from the bay protect the area from storm damage.

Background information on the Tuktoyaktuk community, infrastructure and landfill development was gathered from a variety of locations, and references can be found in **Section 12**.

2.2 Waste Characteristics and Quantity

Waste generated in Inuvialuit communities typically consists of household wastes and a few household hazardous wastes such as paints, solvents, waste oil or batteries. Tuktoyaktuk is home to the "BAR-3" auxiliary DEW line site which ceased operations in 1993. Remediation work was completed in 2002, and therefore, no waste (industrial or otherwise) from that site is anticipated. Solid waste is collected by truck under contract to the Hamlet and transported to the current solid waste facility. The service currently involves one truck operating three days per week.

3. General Overview

The MSW facility provides for the current activities:

- MSW disposal cells
- Sorting and storing pad for potentially recyclable/reusable waste including:
  - Wood area
  - Scrap tire area
  - Construct and demolition (C&D) waste area
  - Metal waste area
  - An exchange area (i.e. Take It or Leave It area) is also provided for people to drop-off and pick-up re-useable items

The Hamlet currently provides a MSW pick-up service and therefore, it is estimated that the majority of the waste at the Landfill will enter the facility via this service. It is assumed that wood, metal, tires, household hazardous waste, and some MSW will be delivered to the facility by residents. No provision has been made at this time for commercial or industrial hazardous waste; if any commercial or industrial entities wish to dispose of their hazardous waste in the Tuktoyaktuk Landfill, they will have to make an application to the Hamlet of Tuktoyaktuk and any appropriate government department before disposal is allowed.

The MSW facility is to provide MSW disposal and storage areas until the new engineered landfill is constructed and operational. This manual provides the operation and maintenance procedures required to properly manage the MSW facility, and to satisfy the requirements of the IWB Water License.

Wastes are deposited at the facility by the Hamlet waste collector in the active area for MSW and bulky waste. Limited diversion of the waste occurs for the appropriate materials. Hazardous waste found at the site is collected by Hamlet personnel and transported for storage at the municipal yard. No burning is allowed at the site.

The Hamlet's collection of MSW is provided by Elias Services of Tuktoyaktuk (867) 977-2153. The service operates three days per week using a three tonne (3 t) truck. It is estimated that 10 cubic metres (m^3) per day of waste is transported to the solid waste site. This equates to an estimated annual volume of 1,560 m^3 of waste deposited at the landfill.

4. Administrative Structure

4.1 Senior Administrative Officer (SAO)

The Senior Administration Officer (SAO) has overall responsibility of all Hamlet Departments, including the Municipal Services/Public Works Department which is responsible for management and operation of the MSW Disposal Facility. The SAO responsibilities in relation to the solid waste facility include:

- Review and allocate operating budget
- Monitor overall operations to confirm compliance with the requirements of the Water License and this manual
- Confirm personnel obtain proper training
- Review emergency response plans and confirm exercises occur on a regular basis
- Coordinate annual audits of the facility
- Liaise with the IWB
- Review and submit reports to the IWB, as required by the Water License
- Respond to public inquiries

4.2 Municipal Services Manager (MSM)

The Municipal Services Manager's (MSM's; also referred to as Municipal Works Manager) responsibilities for the solid waste facility include:

- Prepare annual operation and maintenance budget
- Manage operation and maintenance activities in accordance with the Water License and as indicated in this manual
- Organize training of personnel
- Prepare emergency response plans and schedule regular exercises
- Update the Safety Plan for the facility
- Implement and monitor compliance with the Landfill Operation Policies
- Review and update Landfill Operations Plan and associated policies as required
- Monitor surface water management
- Prepare reports required by the Water License
- Prepare and maintain an operational record of the facility
- Organize Landfill audits
- Monitor operation of the site and confirm regulatory compliance

5. Component Detail and Operation

5.1 Landfill Cells

The following types of waste may be accepted at the Landfill:

- Inert solids – including construction, renovation, and demolition debris
- Municipal solid wastes (MSW) – including plastics; paper; cardboard; wood; kitchen scraps; ceramics; etc.
- Non-hazardous solid wastes – which may include, but not limited to: treated hydrocarbon contaminated soils; solid contents of sump wastes; empty containers (as described in the Empty Container Policy) and other such materials deemed to be non-hazardous as defined by the *Guidelines for the General Management of Hazardous Waste in the Northwest Territories*

The Landfill is to be developed in cells of manageable sizes and compacted using a dozer.

5.2 Metal Waste Diversion Area

An area for the diversion of scrap metal waste is provided at the facility. Metal waste includes, but is not limited to, car bodies, white goods (appliances), metal drums and miscellaneous scrap metal. Metal waste should be crushed and removed from the site on a regular basis when the volume of stored material warrants.

A separate area is allocated for disposal and storage of white goods (i.e. appliances). The “Ozone Depleting Substances Management Policy”, in **Appendix C**, must be followed when receiving refrigerators and other Freon containing appliances. Freon-containing white goods must be segregated until the Freon has been removed. After the Freon has been removed, white goods may be placed in the general metal waste area.

5.3 Tire Diversion Area

Tires are stored here for eventual removal. Access must be provided for fire fighting vehicles. Fire separation must be maintained from other combustible materials.

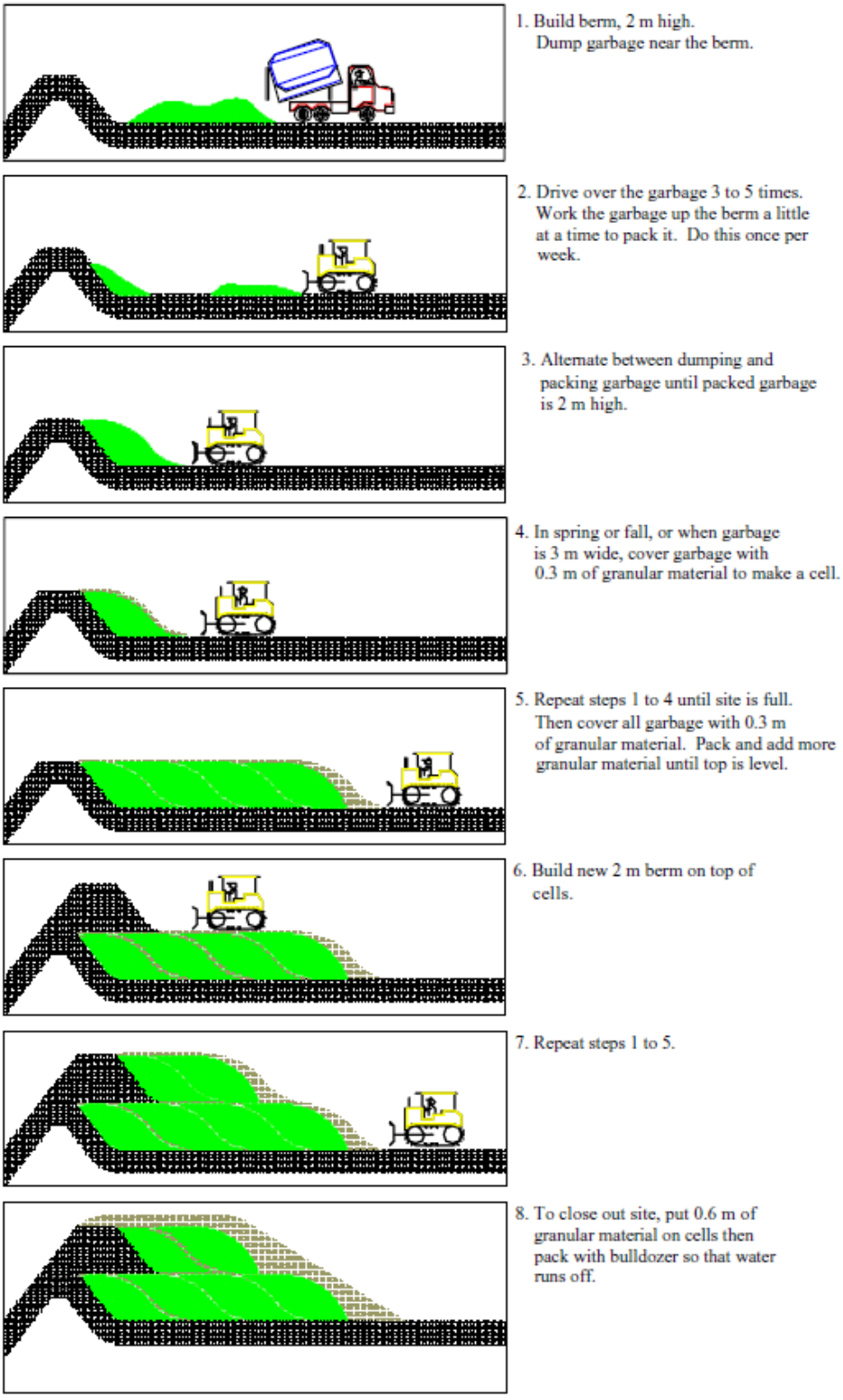

Figure 5-1: Typical Landfill Operation

Taken from *Guidelines for the Planning, Design, Operation and Maintenance of Modified Landfill Sites in the NWT, Government of the Northwest Territories, Municipal and Community Affairs, 2003*

5.4 Household Hazardous Waste (HHW) Temporary Storage

Household Hazardous Waste (HHW) is stored at the municipal yard. The Hamlet of Tuktoyaktuk's hazardous waste program will consist of a series of periodic collections, potentially two per year, during which citizens will bring their household hazardous waste to designated areas for collection and preparation for disposal. A designated drop off spot will be available year round at the facility. After several collection events, over a period of two to four years, the accumulated waste will require ultimate disposal.

Municipal personnel will be trained for hazardous waste handling. Advertising by the Hamlet of the collection event will begin a minimum of 30 days prior to each collection event. The advertisements give the location of the event as well as the dates and the time of day for bringing the wastes to the site. A household hazardous waste collection event will be held in an area, which is easily accessible to the public. The collection event should be organized in such a manner that citizens can drive their vehicles through an area and have the wastes unloaded for them (EarthTech, 2006).

Household hazardous wastes expected to be received at the Municipal Yard include paint, pesticides, batteries, solvents, antifreeze, used motor oil, motor switches, halogen bulbs, etc. Paint drums should be labelled and stored with covers; record types, date, status, etc. It is anticipated that the majority of the HHW will be collected during HHW drop-off events organized by the Hamlet. All hazardous waste accepted at the Municipal Yard shall be properly labeled and identified. Material Safety Data Sheets (MSDS) shall be obtained for all hazardous waste received. MSDS for several products are provided with the **Spill Contingency Plan** in **Appendix D** of this manual.

All personnel responsible for handling hazardous waste shall have Workplace Hazardous Materials Information System (WHMIS) training and shall follow appropriate safety procedures when handling hazardous waste. Personnel working in or around the waste should receive (or have received) and maintain vaccination for Tetanus, Diphtheria (Td) and Hepatitis (A and B). Hamlet personnel shall maintain a record of all hazardous waste on site; such as date of receipt, description, volume, generator, and method of storage.

HHW wastes are stored for eventual removal. Good housekeeping should be maintained and any wastes stored should be segregated by type. For example, batteries should be together, paint cans together, etc.

When hazardous waste is removed from the site the MSM shall maintain a record of the date, description and volume of waste removed, name of carrier, and obtain copies of the Transport of Dangerous Goods forms.

6. Site Management

6.1 Waste Acceptance Procedure

Items that are appropriate for disposal at the Landfill and in the designated cells are identified in **Section 5**. Items that are **not accepted** at the facility are specified in the **Prohibited Waste Policy**. These include:

- Industrial or commercial hazardous waste
- Materials contaminated by hydrocarbons
- Untreated biomedical waste (as per the Canadian Council of Ministers of the Environment Guidelines for the Management of Biomedical Waste in Canada)
- Radioactive waste
- Explosives
- Bulk liquids as defined in the **Prohibited Waste Policy**
- Waste that is smoldering upon delivery (hot loads)
- Asbestos
- Treated wood
- Fuel tanks
- Batteries
- Solvents
- Used oil
- Antifreeze

Wastes that are accepted but require special handling include:

- Animal carcasses
- Appliances containing chlorofluorocarbons (CFCs; i.e. ozone depleting substances)
- Propane tanks and bottles
- Contaminated rags
- Fuel tanks (cleaned and cut as per policy)
- Contaminated soil and contaminated snow
- Empty containers as per the **Empty Container Policy** (**Appendix C**)

Policies for handling these materials are included in **Appendix C** of this manual.

6.2 Hazardous Waste

The IWB water license requires that hazardous waste be segregated and stored in a manner to prevent deleterious substances from entering the water, until such time as they have been removed for proper disposal at an approved facility. Hazardous waste is currently stored at the municipal yard

Hazardous wastes are items that can potentially cause groundwater and/or air pollution when disposed of in a landfill. HHW should be separated from other wastes before they leave the households, and therefore, a special effort by residents will be required to prevent HHW from entering the Landfill for disposal.

6.3 Litter Control

The MSM is responsible for litter control within the facility, surrounding areas and along access roads. The following procedures are recommended to limit litter:

- Limit the size of operating areas so that waste can be compacted at regular intervals
- Housekeeping around recycle and diversion areas
- Use portable fences to catch debris
- Encourage users to secure their load properly for transportation

The MSM or designates shall regularly collect litter from the site, surrounding areas and along access roads.

6.4 Surface Drainage

The site retains spring runoff and rainwater which must be pumped over the berm into the Beaufort Sea in order to control the water level. The Water Licence provides the following conditions regarding removing water from the site:

- GNWT Environment Protection, Inuvik must be notified at least 30 days prior to any discharge of water
- Water can only be discharged once approval has been granted by the GNWT Environment Protection Inspector
- Unless approved by the GNWT Environment Protection Inspector, water can only be discharged between September 15 and October 31
- Discharge cannot occur at the same time as discharge of effluent from the Sewage Disposal Facility
- Discharge of water from the facility shall not exceed a discharge rate of 350 m^3 per hour (97 litres per second; L/s, or 1,283 Imperial gallons per minute; IGPM)
- Discharge must occur at the mouth of the small bay adjacent to the disposal facility
- Discharge must occur from an anchored floating discharge pipe fitted with a diffuser located at a minimum distance of 10 m from the shoreline; discharge must cease upon observing the discharge of turbid water

Water that is to be discharged from the solid waste facility must be sampled at the Sample Station SNP 0714-3 (located at 69° 25' 18.8" N, 133° 2' 0.1" W; shown in Figure 6-1) prior to discharge and once during discharge. Each sample must be analysed for the following parameters:

pH	Total Suspended Solids
Total Mercury	Total Cadmium
Total Chromium	Total Cobalt
Total Copper	Total Manganese
Total Nickel	Total Lead
Total Iron	Total Zinc
Biological Oxygen Demand (BOD_5)	Faecal Coliforms
Polychlorinated Biphenyls	Oil and Grease[1]

[1] Oil and grease added to analytical list as there is a Licence discharge limit.

All water discharged from the site shall meet the following discharged criteria:

Sample Parameter	Maximum Average Concentration
Biological Oxygen Demand (BOD_5)	120.0 mg/L
Total Suspended Solids (TSS)	180.0 mg/L
Polychlorinated Biphenyls (PCB)	25.0 µg/L
Oil and Grease	5.0 mg/L

Figure 6-1: Location of Sample Point SNP 0714-3 (Image taken from Google Earth Pro Software™)

6.5 Maintenance

The MSM is responsible for the maintenance of infrastructure and equipment related to the MSW facility as presented below.

6.5.1 Access roads

Access road maintenance includes snow plowing, grading and dust control. Dust control can be achieved by watering or by using a dust suppressant. Occasionally the road will require reshaping and application of granular surfacing material.

6.5.2 Berms and Drainage Courses

Berms and drainage courses shall be inspected monthly during the summer months. Any signs of leachate breakthrough of the containment berm shall be noted and reported immediately to a professional engineer to provide repair recommendations. Drainage courses shall be maintained to ensure that they continue to perform their intended function.

6.5.3 Gates, Signs, Fences

Gates, signs and fences shall be inspected and maintained. Evidence of deterioration or damage shall be noted and reported to the SAO.

6.5.4 Storage Containers, Buildings

Storage containers and buildings shall be inspected regularly. Evidence of deterioration or damage shall be noted and reported to the SAO.

6.5.5 Heavy Equipment

Heavy equipment used for the MSW operations shall be maintained in good operating condition.

7. Record Keeping and Reporting

7.1 Monthly Reports

The Hamlet must estimate the monthly and annual quantity of waste accepted at the MSW facility, and include this information in the annual report to the IWB.

The facility must also keep a monthly summary of all quantities of hazardous waste removed from the site for storage at the Municipal Yard and a record of hazardous waste transported off site for disposal. The summary of monthly quantities is then to be rolled up into the annual report.

7.2 Annual Report

The Hamlet's Water License (N7L3-0714) requires an Annual Report to be submitted to the IWB. A full list of reporting requirements and submission dates can be found in the IWB Water License, in **Appendix A**. Generally the report must contain the following:

- The monthly and annual quantities of each and all wastes discharged
- Summary of the monthly and annual quantities of hazardous waste stored on site and transported off site
- Any problems, modifications or repairs done to the Waste Disposal Facility
- Tabular summary of the analytical results of the surface water monitoring
- A list of any spills and unauthorized discharges

7.3 Corrective Action Report

In the event that conditions of the Water License are not met, corrective action is required. The corrective action shall be documented and maintained in the operating record. A corrective action report may include:

- A description of the problem
- A description of activities undertaken to correct the problem and results
- A description of the monitoring and effectiveness of the corrective action

7.4 Accident/Incident Reports

Special reports shall be filed for any accident/incidents occurring on site; including vehicle accidents (**Section 11.5**), personal injury (**Section 8.3, 11.3 and 11.4**), spill of deleterious substances **(Appendix D**), fires (**Section 11.1 and 11.2**), etc.

7.4.1 Spill of Deleterious Substances and Unauthorized Discharges

In the event of a spill, the MSM shall immediately report to the 24 Hour Spill Report Line (867-920-8130):

- Nature of the spill
- Cause of the spill
- Current actions to contain the spill
- Anticipated time frame to correct the problem

The MSM will report the spill by telephone to the Hamlet of Tuktoyaktuk SAO. The MSM will document the call and keep a record of the call in the operating record. The **Spill Contingency Plan** is provided in **Appendix D**.

7.5 Wildlife

The presence of bears or other animals at the site shall be reported to the MSM and to the Government of the Northwest Territories (GNWT) Department of Environment and Natural Resources' (DENR) local Tuktoyaktuk office at 867.977.2350. If the local office is unavailable, the GNWT DENR Inuvik regional office can be reached at 867.678.6650.

8. Safety Plan

8.1 General

Site safety is coordinated through the MSM. The MSW facility shall be operated according to the **Safe Work Policy** provided in **Appendix C**.

All operations shall be conducted with safety as a priority at all times. All municipal employees shall:

- Receive the appropriate safety training
- Wear the appropriate personal safety equipment
- Not endanger themselves or others at any time
- Report unsafe practices
- Notify other employees or site users when they are acting in an unsafe manner
- Receive and maintain vaccination for Tetanus, Diphtheria (Td) and Hepatitis (A and B)

All **accidents, injuries,** or **near misses** shall be reported to the Municipal Services Manager and the appropriate safety official at the Hamlet, and the following steps shall be taken:

- Investigate the incident immediately
- Find out the cause
- Make a complete incident report
- Take immediate measures to correct the cause and prevent it from reoccurring
- Have a safety meeting with employees as soon as possible after the incident

8.2 Traffic Accidents

Traffic accidents occurring at the site shall be reported to the RCMP and investigated by the MSM who shall also complete an **Accident Report Form** (provided in **Appendix E**).

8.3 Medical Emergencies

All injuries, even minor injuries, should be considered important and should be reported as a safety incident to the MSM or Tuktoyaktuk Safety Officer.

First Aid should be applied in a manner that is appropriate to the nature of the injury. If the injury requires medical assistance, the individual should be taken to a medical emergency centre or an ambulance service contacted.

A medical doctor should be consulted for all injuries that may result in infections as a result of working with waste materials. This includes injuries such as cuts and scrapes, skin punctures with sharp items, and fire or chemical burns.

If the person injured on-site is a customer or visitor, the MSM and employees shall provide any assistance necessary and administer appropriate First Aid.

8.4 Personal Decontamination Procedures

In instances where workers accidentally come in contact with unknown substances, the following procedures shall be followed.

Skin Contact: Wash with water for approximately 15 minutes. See a physician if any sign of irritation occurs.

Eye Contact: Flush eye(s) with a gentle stream of water for 15 minutes (use eye wash station with distilled water). See physician, without exception.

Ingestion: Contact emergency services immediately and provide them with as much information as possible about the product that was ingested. Do not induce vomiting unless instructed to do so.

Inhalation: Remove person to fresh air. If discomfort persists, take victim to physician. Provide physician with as much information on the inhaled material as possible.

9. Fires

All fires shall be considered serious and immediately reported to the MSM. An incident report must be completed for all fire occurrences, with a copy kept on file and one sent to the Hamlet Safety Official.

The MSM may take charge of extinguishing fires that are small and contained. However, fires that are burning out of control or giving off toxic fumes shall be managed by the Fire Department.

9.1 Fire Prevention

The Landfill shall be operated in a manner that minimizes the potential for fires. Fire prevention techniques include:

- Prohibit staff and customers from lighting fires at the facility
- Prohibiting smoking at the Landfill facility outside of designated smoking area(s)
- Thoroughly compact all waste regularly
- Do not authorize the dumping of hot/burning debris, explosives or highly combustible waste
- Provide an area apart from the general tipping area for dumping of ash barrels
- Maintain a reserve of cover material near active working areas for immediate action in case of fire
- Conduct a site inspection at the end of the day looking for evidence of smoke
- Train employees on early fire hazard recognition

9.2 General Fire-Fighting Procedures

- Cover the burning material with soil
- Dig out the burning debris and let it burn in a controlled environment, away from other combustible materials
- Use water

9.3 General Fire Response Procedure

- Secure the area
- In cases of small fires, direct customers to safe areas. In cases of large fires, follow **Emergency Response** procedures and quick reference guides for **Fire at the Landfill** and **Fire in Recycle Area**
- Notify the MSM
- Call the Tuktoyaktuk Fire Department at 867.977.2222
- Do not fight a fire alone, work with other staff members, and ONLY if safe to do so
- Do not place yourself or others in danger while fighting a fire
- Heavy equipment shall only be used to place material to smother a fire, and only when safe to do so

10. Emergency Response

Emergency response may be required in cases of:

- Fire or gaseous release
- Spills
- Accidental Injury or Medical

In all emergencies the MSM shall have complete authority over the site. The MSM's responsibilities in an emergency are:

- Declare the emergency
- Evacuate non-essential personnel or isolate the area – as warranted by the severity of the situation
- Notify the appropriate response agency
- Notify the SAO and other Hamlet personnel
- Establish control and manage the situation prior to arrival of the response agency
- Liaise with the emergency response representatives upon their arrival
- Declare the end of the emergency
- Complete a report documenting the nature of the emergencies and actions undertaken

The MSM will contact the appropriate agency to report incidents related to environmental or health and safety associated with the emergency.

Municipal Services / Works of the Hamlet of Tuktoyaktuk will review the emergency plan annually and following an emergency incident ensure that:

- Emergency response procedures for the Landfill are effective and updated as necessary
- Appropriate individuals are appointed to manage emergency situations
- Regular fire prevention meetings are conducted with all Landfill employees and the Fire Department
- Regular safety and emergency meetings are held with Landfill employees

10.1 Contact Information

Additional contact information is also provided in **Appendix B**.

- Hamlet of Tuktoyaktuk Office: 867.977.2286
- Hamlet of Tuktoyaktuk Works: 867.977.2479
- GNWT Environment and Natural Resources Regional Office - Inuvik: 867.678.6650 or 867.678.6690
- GNWT Environment and Natural Resources Local Office - Tuktoyaktuk: 867.977.2350
- GNWT Environment Protection – Inuvik:867.678.6676
- RCMP - Tuktoyaktuk Detachment: 867.977.1111
- Tuktoyaktuk Fire Department: 867.977.2222
- Tuktoyaktuk Health Centre: 867.977.2321
- Inuvik Regional Hospital: (general) 867.777.8000 or (emergency) 867.777.8160
- Hazardous Waste Spill 24 Hour Hotline: 867.920.8130
- Elias Services of Tuktoyaktuk (Waste Collection Contractor): 867.977.2153

11. Reference Guide

The following tables provide a quick reference guide describing how to prevent and respond to several potential contingency situations that may arise.

11.1 Fire at the Landfill

Prevention

- Staff training and awareness
- Waste acceptance procedures and policies
- Diversion of hot loads, combustible and/or explosive material from working area
- Application of cover soils to minimize size of the active working area

Response Plan

Action	Time Frame	Who?	Resources
Evacuate and secure the area	Immediately	MSM	Municipal Works Personnel
Call: Fire Department IWB MSM Hamlet Safety Official	Immediately	MSM	Municipal Works Personnel
Isolate the burning wastes	Immediately	MSM	Landfill Equipment
Determine the nature and extent of the fire	Immediately	MSM	Municipal Works Personnel
Excavate, remove, and soak the burning waste	As soon as it is determined safe to do so	MSM	Municipal Works Personnel Fire Department Landfill equipment Water truck Water pumps
Cover the burning area	Immediately after the source of burning waste has been excavated and removed, and as soon as it is safe to do so	MSM	Municipal Works Personnel Fire Department Landfill equipment
Appoint staff for fire guard	After fire is extinguished	MSM	Municipal Works Personnel Fire Department
Confirm the fire is extinguished	Immediately	MSM	Fire Department
Review the cause of fire and implement mitigative measures	Within 1 month	MSM Hamlet Safety Official	Municipal Works Personnel Fire Department

11.2 Fire in Recycle Area

Prevention

- Separation of materials according to the Fire Code

Response Plan

Action	Time Frame	Who?	Resources
Evacuate and secure the area	Immediately	MSM	Municipal Works Personnel
Call: Fire Department MSM Hamlet safety official	Immediately	MSM	Municipal Works Personnel
Determine the nature of the burning material and potential for emission of toxic fumes	Immediately	MSM	Fire Department IWB
Isolate the burning material	Immediately, if safe to do so	MSM	Fire Department
Determine the nature and extent of the fire	Immediately	MSM	Municipal Works Personnel
Extinguish the fire as appropriate; according to the nature of the material	As soon as it is safe to do so	MSM	Municipal Works Personnel Fire Department Landfill equipment Water truck Water pumps
Confirm the fire is extinguished	Immediately	MSM	Fire Department
Review cause of fire and prepare appropriate mitigative measures	Within 1 month	MSM Hamlet Safety Official	Municipal Works Personnel Fire Department

11.3 Minor Medical Injuries

Prevention

- Safety plan and procedures
- Employee safety training and awareness
- First Aid training

Response Plan

Action	Time Frame	Who?	Resources
Apply appropriate First Aid	Immediately	First Aider	
Recommend that the injured person consult a physician	Immediately	First Aider	
Take the injured person to a medical emergency centre or contact an ambulance service if deemed appropriate	Immediately	First Aider	
Record injury in the weekly report	By end of the work day	MSM	Municipal Works Personnel
Review cause of the injury and prepare appropriate mitigative measures	Within 1 month	MSM Hamlet Safety Official	Municipal Works Personnel Occupational Health and Safety

11.4 Serious Medical Injury

Prevention

- Safety plan and procedures
- Employee safety training and awareness
- First Aid training

Response Plan

Action	Time Frame	Who?	Resources
Assess site conditions for personal safety and safety of others, and take appropriate actions to secure unsafe areas	Immediately	MSM First Aiders	Municipal Works Personnel
Attend to the injured person and apply First Aid	Immediately when safe to do so	First Aider	
Contact: Ambulance MSM Hamlet Safety Official	Immediately	First Aider MSM	
Stay with the injured person until medical assistance arrives	Duration of medical emergency	First Aider	
Record injury in the weekly report	By the end of the work day	MSM or Designated Alternate	Municipal Works Personnel
Conduct an investigation to determine the cause of injury and prepare appropriate mitigative measures	Investigate immediately following the incident. Complete mitigative measures within 1 month of the incident	MSM Hamlet Safety Official	Municipal Works Personnel Occupational Health and Safety

11.5 Vehicle or Equipment Accidents

All vehicle accidents shall be reported and an investigation as to the cause should be carried out. Following the investigation, appropriate mitigative measure should be implemented to avoid future accidents.

Prevention

- Safety plan and procedures
- Employee safety training and awareness
- Traffic control signs

Response Plan

Action	Time Frame	Who?	Resources
Report the accident to the MSM	Immediately	Municipal Works Personnel	
If damage is minor, have the vehicle driver report the accident to the RCMP	Immediately	MSM	
If the damage is significant, call the RCMP	Immediately	MSM	
If an injury is involved, call the Hamlet of Tuktoyaktuk Municipal Services / Works at 867.977.2286 or 867.977.2479 , and implement medical response actions	Immediately	MSM	
Secure the area for a follow-up investigation	Immediately	MSM	
Record the injury in the weekly report	By the end of the work day	MSM or Designated Alternate	Municipal Works Personnel
Conduct an investigation into the cause of the accident and prepare appropriate mitigative measures	Within 1 month of the accident	MSM RCMP Hamlet Safety Official	Occupational Health and Safety

11.6 Prohibited Wastes Delivered to the Landfill

Prevention

- Waste acceptance policies and procedures
- Employee training and awareness

Response Plan

Action	Time Frame	Who?	Resources
Deny entry of the load	Immediately	MSM	Operation and Maintenance Plan Waste Acceptance Procedures IWB
Determine if load is safe for transport on local roads	Within 1 hour	MSM	Transport Canada Transport of Dangerous Goods Regulations
Inform the waste generator of the infraction	Within 1 hour	MSM	
Document the nature of incident and actions taken	Within 1 hour	MSM	Weekly Activity Log Book Hazardous Material Check Form
Review waste acceptance procedures and implement necessary mitigative measures	Within 1 month	MSM	Hamlet safety official

11.7 Prohibited Waste Discovered at the Landfill

Prevention

- Waste acceptance policies and procedures
- Employee training and awareness

Response Plan

Action	Time Frame	Who?	Resources
Isolate waste and cease operations in the area of the waste	Immediately	MSM	IWB Environmental Consultant
Construct containment around perimeter of the waste if necessary	Immediately	MSM	Landfill equipment 50 Gal Spill Kit
Determine source of waste, and if possible the waste hauler and generator	Within 1 week	MSM	Scale Records Staff observations
If identified, contact the hauler and waste generator to review options	Within 1 to 2 weeks	MSM	
Document nature of incident and actions taken	Within 1 hour	MSM	Weekly Activity Log Book Hazardous Material Check Form
Inform Inuvialuit Water Board (IWB)	When results have been confirmed	MSM	
Review waste acceptance procedures and practices, and implement mitigative measures	Within 1 month	MSM	Hamlet Safety Official

11.8 Hot Loads (Loads with Smoldering Materials) Delivered to the Landfill

Prevention

- Waste acceptance policies and procedures
- Employee training and awareness

Response Plan

Action	Time Frame	Who?	Resources
Designate an area away from the working area	Immediately	MSM	
Contain burning material within soil berms	Immediately	MSM	Municipal Works Personnel
Apply appropriate measures to extinguish the fire: wet, smother with soil, or allow to burn out	Within 1 hour	MSM	Water truck Landfill Equipment Municipal Works Personnel
Monitor fire	For duration of fire	MSM	Municipal Works Personnel
Remove extinguished material and dispose at working area	Within 2 to 3 days after being extinguished	MSM	Landfill Equipment Municipal Works Personnel

11.9 Wind Blown Litter

Prevention

- Ensure the customer or operator is transporting landfill acceptable materials which are properly covered and secured
- Maintain as small a working area as practical
- Maintain portable litter catchment fences around active areas
- Maintain perimeter fencing free of debris, papers and wind-blown substances

Response Plan

Action	Time Frame	Who?	Resources
Review working area and litter catchment fence placement	Immediately	MSM	Environmental Consultant
Implement off-site litter pick-up	Within 1 week	MSM	Temporary staff
Implement on-site litter pick-up	Within 1 month	MSM	Temporary staff
Review litter control program and revise if necessary	Within 2 months	MSM	Environmental Consultant

11.10 Hazardous Material Spill Contingency

Prevention

- Waste acceptance
- Employee training and awareness

Storage

The MSM should develop hazardous spill contingency plans associated with removal of hazardous material in conjunction with Northwest Territories officials when transportation opportunities arise.

Scope

Other than the HHW, which already has secondary containment, the most probable source of a hazardous material spill is petroleum products from vehicles or equipment at the site; which would be a spill limited to the size of the vehicle or equipment tank. For additional information please see the **Hamlet of Tuktoyaktuk Spill Contingency Plan** in **Appendix D**.

Equipment

- 50 Gallon Capacity Universal Sorbent Spill Kit includes:
  - 10 – 3" x 48" socks
  - 4 – 3" x 10' socks
  - 50 – 15" x 17" pads
  - 4 pillows
  - 50 wipers
  - 5 disposal bags and ties
  - 5 tamperproof seals
  - 2 pair nitrile gloves
  - 1 emergency response guidebook

Response Plan

Action	Time Frame	Who?	Resources
Contain and clean spill	Immediately	MSM	50 Gallon Spill Kit
Contact Fire Department for support & additional response	Immediately	MSM	
Call Hazardous Spill Hotline	Immediately	MSM	Environmental Consultant
Review operating procedures and acceptance policies and identify appropriate mitigative measures	Within 1 week	MSM	Environmental Consultant Hamlet Safety Official

12. Reference Information

The preparation of this O&M manual is based upon the following information sources:

1. **AECOM, 2009.** *"Hamlet of Tuktoyaktuk - Background Report for Water Licence Renewal"*. AECOM, 2009.
2. **AECOM, 2013.** *"Hamlet of Tuktoyaktuk - Solid Waste Site Relocation - Planning Report"*. AECOM, 2013.
3. **AECOM, 2014.** *"Hamlet of Tuktoyaktuk - Project Description - Solid Waste Landfill".* AECOM, 2014.
4. **AECOM, 2014.** *"Hamlet of Tuktoyaktuk - Spill Contingency Plan".* AECOM, 2014.
5. **CCME, 2008.** *"Inuvialuit Settlement Region Impact Analysis".* Canadian Council of Ministers of the Environment, 2008.
6. **DMCA GNWT, 1996.** "Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories". D. Duong & R. Kent, Department of Municipal and Community Affairs, Government of Northwest Territories, 1996.
7. **DMCA GNWT, 1990.** *"Establishing Guidelines for the Separation of Solid Waste Disposal Sites and Airports in the Northwest Territories. Final Report - Phase 1"*. R. M. Soberman, G. W. Heinke, and M. Lovicsek, Department of Municipal and Community Affairs, Government of Northwest Territories, 1990.
8. **DMCA GNWT, 2003**. *"Guidelines for the Planning, Design, Operation and Maintenance of Modified Solid Waste Sites in the Northwest Territories"*. R. Kent, P. Marshall, and L. Hawke, Department of Municipal and Community Affairs, Government of Northwest Territories, 2003.
9. **DMCA GNWT, 2003.** *"Guidelines for the Collection, Treatment and Disposal of Hazardous and Bulky Wastes in the Northwest Territories"*, P.L. Heeney & G.W. Heinke, Department of Municipal and Community Affairs, Government of Northwest Territories, 2003.
10. **EarthTech, 2005.** *"Hamlet of Tuktoyaktuk Operation and Maintenance Documentation - Sewage Treatment Facility"*. EarthTech, 2005.
11. **EarthTech, 2006.** *"Hamlet of Tuktoyaktuk Operation and Maintenance Documentation - Municipal Solid Waste Facility"*. EarthTech, 2006.
12. **ESWG, 1996.** *"A National Ecological Framework for Canada".* Ecological Stratification Working Group, 1996.
13. **DEN, 2011.** *"Environmental Guideline for Industrial Waste Discharges into Municipal Solid Waste and Sewage Treatment Facilities"*. Department of Environment, Government of Nunavut, 2011.
14. **INAC, 2007**. *"Guidelines for Spill Contingency Planning".* Indian and Northern Affairs Canada, 2007.
15. **IWB, 1992.** "Guidelines for the Discharge of Treated Municipal Wastewater in Northwest Territories". Northwest Territories' Inuvialuit Water Board (IWB), 1992.
16. **IWB, 2010**. *"Hamlet of Tuktoyaktuk Type B Water License N7L3-0714*". Northwest Territories' Inuvialuit Water Board (IWB), 2010.
17. **IWB, 2014**. "Guidance for the Preparation of Waste Management Plans", Inuvialuit Water Board, 2014.
18. **Kiggiak-EBA, 2011.** *"Environmental Impact Statement for construction of the Inuvik to Tuktoyaktuk Highway, NWT"*. Kiggiak-EBA. 2011.
19. **Romanovsky, 2010.** *"Permafrost Thermal State in the Polar Northern Hemisphere during the International Polar Year 2007–2009: a Synthesis"*. Romanovsky, Smith, and Christiansen, 2010.

Appendix A

Northwest Territories' Inuvialuit Water Board (IWB) Water Licence

NORTHWEST TERRITORIES WATER BOARD

NUNAPPA SIVUNIUKPAIT IMMAKUN

April 23, 2010

Attention: Debbie Raddi
Senior Administrative Officer
Hamlet of Tuktoyaktuk
BOX 120
Tuktoyaktuk, NT
X0E 1C0

File: N7L3-0714

Dear Ms. Raddi:

ISSUANCE OF TYPE B WATER LICENCE RENEWAL

Attached is Water Licence N7L3-0714 granted by the Northwest Territories Water Board (the Board) in accordance with the *Northwest Territories Waters Act*. A copy of this Licence has been filed in the Public Registry at the NWTWB offices. Water Licence N7L3-1525 has been approved for a period of three years commencing April 23rd, 2010 and expiring November 20, 2013. Also attached are the general procedures for the administration of Licences in the Northwest Territories. Please review these carefully and address any questions to the Board's office.

This letter, with attached procedures, all Inspection Reports and correspondence related thereto are part of the Public Registry and are intended to keep all interested parties informed of the manner in which the Licence requirements are being met. All Public Registry material will be considered if an amendment to the Licence is requested.

The full cooperation of Hamlet of Ulukhaktok is anticipated and appreciated. Should you have any further questions or concerns, please telephone the Northwest Territories Water Board at (867) 678-2942 or e-mail at info@nwtwb.com.

Yours sincerely,

Eddie Dillon
Chair

Attachments

Copied to: Carol Mills, Manager, Water Resources, INAC;
Conrad Baetz, North Mackenzie District Office- INAC

NORTHWEST TERRITORIES WATER BOARD

Pursuant to the *Northwest Territories Water Act* and Regulations, the Northwest Territories Water Board, hereinafter referred to as the Board, hereby grants to:

Hamlet of Tuktoyaktuk
(Licensee)

of P.O. Box 120, Tuktoyaktuk, NT, X0E 1C0
(Mailing Address)

Hereinafter called the Licensee, the right to alter, divert or otherwise use water subject to the restrictions and conditions contained in the *Northwest Territories Waters Act* and Regulations made thereunder and subject to and in accordance with the conditions specified in this Licence.

Licence Number:	N7L3-0714 (RENEWAL)
Licence Type:	"B"
Water Management Area:	NORTHWEST TERRITORIES 07
Location:	Hamlet of TUKTOYAKTUK, Northwest Territories
Purpose:	WATER USE AND WASTE DISPOSAL FOR A MUNICIPAL UNDERTAKING
Quantity of water **not to be exceeded**:	100,000 CUBIC METRES
Effective Date of Licence:	April 23rd, 2010
Expiry Date of Licence:	November 20th, 2013

This Licence issued and recorded at Yellowknife includes and is subject to the annexed conditions.

NORTHWEST TERRITORIES WATER BOARD

Witness **Chair**

GENERAL PROCEDURES FOR THE ADMINISTRATION OF LICENCES ISSUED UNDER THE NORTHWEST TERRITORIES WATERS ACT IN THE NORTHWEST TERRITORIES

1. At the time of issuance, a copy of the Licence is placed on the Water Register in the Office of the Northwest Territories Water Board in Yellowknife, and is then available to the public.

2. To enforce the terms and conditions of the Licence, the Minister of Indian Affairs and Northern Development has appointed Inspectors in accordance with Section 35(1) of the *Northwest Territories Waters Act*. The Inspectors coordinate their activities with officials of the Water Resources Division of the Department of Indian Affairs and Northern Development. The Inspector responsible for Licence No. N7L3-0714 is located in the North Mackenzie - Inuvik District Office.

3. To keep the Water Board and members of the public informed of the Licensee's conformity to Licence conditions, the Inspectors prepare reports which detail observations on how each item in the Licence has been met. These reports are forwarded to the Licensee with a covering letter indicating what action, if any, should be taken. The inspection reports and covering letters are placed on the public Water Register, as are any responses received from the Licensee pertaining to the inspection reports. It is therefore of prime importance that you react in all areas of concern regarding all inspection reports so that these concerns may be clarified.

4. If the renewal of Licence No. N7L3-0714 is contemplated it is the responsibility of the Licensee to apply to the Water Board for renewal of the Licence. The past performance of the Licensee, new documentation and information, and points raised during a public hearing, if required, will be used to determine the terms and conditions of any Licence renewal. Please note that if the Licence expires and another has not been issued, then water and waste disposal must cease, or you, the Licensee, would be in contravention of the *Northwest Territories Waters Act*. It is suggested that an application for renewal of Licence No. N7L3-0714 be made at least eight months in advance of the Licence expiry date.

5. If, for some reason, Licence No. N7L3-0714 requires amendment, then a public hearing may be required. You are reminded that applications for amendments should be submitted as soon as possible to provide the Water Board with ample time to go through the amendment process. The process may take up to six (6) months or more depending on the scope of the amendment requested.

.....2

6. Specific clauses of your Licence make reference to the Board, Analyst or Inspector. The contact person, address, phone and fax number of each is:

BOARD:

Executive Director
Northwest Territories Water Board
Box 2531
INUVIK, NT X0E 0T0

Phone No: (867) 678-2942
Fax No: (867) 678-2943

Executive Director
Northwest Territories Water Board
Box 1326
YELLOWKNIFE, NT X1A 2N9

Phone No: (867) 765-0106
Fax No: (867) 765-0114

ANALYST:

Analyst
Water Laboratory
Department of Indian Affairs
and Northern Development
Box 1500, 4601 - 52nd Avenue
YELLOWKNIFE, NT X1A 2R3

Phone No: (867) 669-2780
Fax No: (867) 669-2718

INSPECTOR:

Inspector
North Mackenzie-Inuvik District Office
Department of Indian Affairs
and Northern Development
P.O. Box 2100
INUVIK, NT X0E 0T0

Phone No: (867) 777-3361
Fax No: (867) 777-2090

PART A: SCOPE AND DEFINITIONS

1. Scope

This Licence entitles the Incorporated Hamlet of Tuktoyaktuk to use water and dispose of Waste for municipal undertakings at Tuktoyaktuk, Latitude 69°27' North and Longitude 133°02' West, Northwest Territories.

This Licence is issued subject to the conditions contained herein with respect to the taking of water and the depositing of Waste of any type in any Waters or in any place under any conditions where such Waste or any other Waste that results from the deposits of such Waste may enter any Waters. Whenever new Regulations are made or existing Regulations are amended by the Governor in Council under the *Northwest Territories Waters Act*, or other statutes imposing more stringent conditions relating to the quantity or type of Waste that may be so deposited or under which any such Waste may be so deposited, this Licence shall be deemed, upon promulgation of such Regulations, to be automatically amended to conforming to such Regulations.

Compliance with the terms and conditions of this Licence does not absolve the Licensee from responsibility for compliance with the requirements of all applicable Federal, Territorial and Municipal legislation.

This Licence is issued subject to the conditions contained herein with respect to the Use of Waters as prescribed in Section 8 of the Act and the Deposit of Waste to any Waters as prescribed in Section 9 of the Act.

2. Definitions

In this Licence: **N7L3-0714**

"*Act*" means the *Northwest Territories Waters Act;*

"Analyst" means an Analyst designated by the Minister under Section 35(1) of the *Northwest Territories Waters Act*;

"Average Concentration" means the discrete average of up to four consecutive analytical results submitted to the Board in accordance with the sampling and analysis requirements specified in the "Surveillance Network Program";

"Average Concentration for Faecal Coliforms" means the running geometric mean of up to four consecutive analytical results submitted to the Board in

accordance with the sampling and analysis requirements specified in the "Surveillance Network Program";

"Bagged Toilet Waste Disposal Facilities" comprises the area and associated structures designed to contain bagged Toilet Waste (honey bags);

"Board" means the Northwest Territories Water Board established under Section 10 of the *Northwest Territories Waters Act*;

"Freeboard" means the vertical distance between water line and the lowest elevation of the effective water containment crest on a dam or dyke's upstream slope;

"Geotechnical Engineer" means a professional engineer registered with the Northern Association of Professional Engineers and Geoscientist and whose principal field of specialization is the design and construction of earthworks in a permafrost environment;

"Greywater" means all liquid Waste from showers, baths, sinks, kitchens and domestic washing facilities, but does not include Toilet Waste;

"Inspector" means an Inspector designated by the Minister under Section 35(1) of the *Northwest Territories Waters Act;*

"Licensee" means the holder of this Licence;

"Minister" means the Minister of Indian Affairs and Northern Development;

"Modification" means an alteration to a physical work that introduces a new structure or replaces an existing structure and does not alter the purpose or function of the work, but does not include an expansion;

"Pump-out Sewage" means all Toilet Wastes and/or Greywater collected by means of a vacuum truck for disposal at an approved facility;

"Regulations" means Regulations proclaimed pursuant to Section 33 of the *Northwest Territories Waters Act;*

"Sewage" means all Toilet Wastes and Greywater;

"Sewage Disposal Facilities" comprises the area and engineered structures designed to contain Sewage;

"Solid Waste Disposal Facilities" comprises the area and associated structures designed to contain solid Waste including structures used to contain surface runoff;

"Toilet Wastes" means all human excreta and associated products but does not include Greywater;

"Waste" means Waste as defined by Section 2 of the *Northwest Territories Waters Act;*

"Waste Disposal Facilities" means all facilities designated for the disposal of Waste and include the Sewage Disposal Facilities, Solid Waste Disposal Facilities, and Bagged Toilet Wastes Disposal Facilities;

"Water Supply Facilities" means all facilities designed to collect, treat and supply water for municipal purposes; and

"Waters" means any Waters as defined by Section 2 of the *Northwest Territories Waters Act;*

PART B: GENERAL CONDITIONS

1. The Licensee shall file an Annual Report with the Board and an Inspector no later than April 30th of the year following the calendar year reported that shall contain the following information:

    a. The monthly and annual quantities in cubic metres of fresh water obtained from all sources;

    b. the monthly and annual quantities of each and all Wastes discharged;

    c. a summary of the monthly and annual quantities of hazardous Waste stored on site and transported off site;

    d. the monthly and annual quantities of solid Waste (e.g. sludge) removed from the Sewage Disposal Facilities for disposal;

    e. any problems, Modifications or repairs done to the Water Supply and Waste Disposal Facilities, including all associated structures;

    f. tabular summaries of all data generated under the "Surveillance Network Program";

    g. a list of spills and unauthorized discharges;

    h. an outline of any spill training and/or other operator training carried out;

    i. a summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year;

j. a summary of any studies requested by the Board that relate to Waste disposal, water use, or reclamation, and a brief description of any future studies planned;

k. updates and/or revisions to the approved Spill Contingency Plan, Municipal Solid Waste Operations and Maintenance Plan, and Sewage Treatment Plan; and,

l. any other details on Waste disposal or water use requested by the Board by November 1st of the year being reported.

2. The Licensee shall comply with the "Surveillance Network Program" annexed to this Licence, and any amendment to the said "Surveillance Network Program" as may be made from time to time, pursuant to the conditions of this Licence.

3. The "Surveillance Network Program" and compliance dates specified in the Licence may be modified at the discretion of the Board.

4. The Licensee shall, within 60 days of the issuance of this Licence, submit to the Board for approval a map or drawing indicating the location of all Surveillance Network Program sampling stations.

5. The Licensee shall, within 60 days of issuance of the Licence, post signs in the appropriate areas to inform the public of Water Supply, Waste Disposal Facilities and the segregated temporary storage of Hazardous waste areas. All postings shall be located and maintained to the satisfaction of an Inspector.

6. Any meters, devices or other such methods used for measuring the volumes of water used or Waste disposed and discharged shall be installed, operated and maintained to the satisfaction of an Inspector.

7. The Licensee shall immediately report to the 24 Hour Spill Report Line (**867 920-8130**) any spills which are reported to, or observed by, the Licensee within the municipal boundaries, or in the areas of the Water Supply or Waste Disposal Facilities.

8. The Licensee shall ensure a copy of this Licence is maintained at the municipal office at all times.

PART C: CONDITIONS APPLYING TO WATER USE

1. The Licensee shall obtain all water for human consumption from Kudlak Lake using the Water Supply Facilities or as otherwise approved by the Board.

2. The Licensee may obtain water from an alternate water supply for use on an emergency basis upon approval of an Inspector when it is not possible to obtain water from Kudlak Lake as stated in Part C, Item 1.

3. The yearly quantity of water used for all purposes shall not exceed 100,000 cubic metres.

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall direct all Pump-out Sewage to the Sewage Disposal Facilities or as otherwise approved by the Board

2. All Sewage effluent discharged from the Sewage Disposal Facilities at "Surveillance Network Program" Station Number 0714-2 shall meet the following effluent quality standards:

Parameter	Maximum Concentration	Average
Faecal Coliforms	1×10^4 CFU/100ml	
Biological Oxygen Demand (BOD_5)	120.0 mg/L	
Oil and Grease	5 mg/L	
Total Suspended Solids (TSS)	180.0 mg/L	

The Waste discharged shall have a pH between six (6) and nine (9) and no visible sheen of oil and grease.

3. The Licensee shall advise an Inspector at least ten (10) days prior to initiating and decant of the Sewage Disposal Facilities.

4. The Licensee shall ensure that the Sewage Disposal Facilities are maintained and operated in such a manner as to prevent structural failure.

5. The Licensee shall maintain the Sewage Disposal Facilities to the satisfaction of an Inspector.

6. A Freeboard limit of 1.0 metres or as recommended by a qualified Geotechnical Engineer and as approved by the Board, shall be maintained at all dykes and earthfill structures associated with the Solid Waste Disposal Facilities.

7. All Bagged Toilet Wastes (honey bags) shall be disposed of at the Bagged Toilet Waste Disposal Facilities to the satisfaction of an Inspector.

8. The Licensee shall dispose of all solid Wastes at the Solid Waste Disposal Facilities or as otherwise approved by the Board.

9. The Licensee shall notify an Inspector at least thirty (30) days prior to any discharge of water from the Solid Waste Disposal Facilities.

10. The Licensee may commence the discharge of water from the Solid Waste Facilities upon receipt of an Inspector's approval.

11. Any discharge of water from the Solid Waste Disposal Facilities shall be conducted between September 15 and October 31. No discharge shall occur at any other time unless approved by the Inspector.

12. Any discharge of water from the Solid Waste Disposal Facilities shall not be conducted at the same time as the discharge of sewage effluent from the Sewage Disposal Facilities.

13. Any discharge of water from the Solid Waste Disposal Facilities shall not exceed a discharge rate of 350 cubic metres per hour.

14. Any discharge of water from the Solid Waste Disposal Facilities shall be discharged to the mouth of the small bay adjacent to the Solid Waste Disposal Facilities.

15. The Solid Waste Disposal Facilities discharge outlet shall be located ten (10) metres from the shoreline, at a minimum.

16. The Solid Waste Disposal Facilities discharge outlet shall be anchored to minimize drifting and shall be fitted with a diffuser.

17. Any discharge of water from the Solid Waste Disposal Facilities shall require the use of a floating intake.

18. The Licensee shall cease discharge of water from the Solid Waste Disposal Facilities immediately upon observing the discharge of turbid water.

19. All water discharged from the Solid Waste Disposal Facilities at "Surveillance Network Program" Station Number 0714-3 shall meet the following effluent quality criteria:

Sample Parameter	Maximum Average Concentration
Biological Oxygen Demand (BOD_5)	120.0 mg/L
Total Suspended Solids (TSS)	180.0 mg/L
Polychlorinated Biphenyls (PCB)	25.0 µg/L
Oil and Grease	5.0 mg/L

20. A Freeboard limit of 0.5 metres or as recommended by a qualified Geotechnical Engineer and as approved by the Board, shall be maintained at all dykes and earthfill structures associated with the Solid Waste Disposal Facilities.

21. The Licensee shall notify an Inspector when any contaminated soil or contaminated snow is deposited at the Solid Waste Disposal Facilities.

22. The Licensee shall contain all contaminated soil or contaminated snow in such a manner as to minimize the potential for migration of contaminants into any Waters, to the satisfaction of an Inspector.

23. The Licensee shall segregate and store hazardous Waste in a temporary storage area, to the satisfaction of an Inspector.

24. The Licensee shall not open burn solid or liquid Waste, with the exception of paper products, paperboard packaging and untreated wood in accordance with, for exemple, the guideline *Municipal Solid Wastes Suitable for Open Burning*, developed by the GNWT Department of Environment and Natural Resources.

25. The Licensee shall ensure that any unauthorized Wastes associated with the municipal undertaking do not enter any Waters.

26. The Licensee shall, by July 31st, 2013, submit an assessment of the effects of the Solid Waste Disposal Facilities on the small bay adjacent to the facilities, including, but not be limited to:

    a. sampling and analysis of water before, during and after decanting from the Solid Waste Disposal Facilities;
    b. sampling and analysis of sediments before and after decanting from the Solid Waste Disposal Facilities; and
    c. sampling and analysis of fish, shellfish and benthic organisms.

PART E: CONDITIONS APPLYING TO OPERATION AND MAINTENANCE

1. The Licensee shall submit to the Board for approval by January 31st, 2011 a Spill Contingency Plan in accordance, for exemple, with the *Guidelines for Spill Contingency Planning, April 2007,* developed by INAC-Water Resources Division.

2. The Licensee shall submit to the Board for approval, by January 31st 2012, a Sewage Treatment Plan that includes the following:

    a. specifications of the Sewage Treatment Facility including engineering drawings and design performance standards;
    b. operations, maintenance and monitoring programs for the Sewage Treatment Facility including maintenance schedules (e.g. frequency of inspection of dams, dykes and drainage courses);

c. sludge management program including the disposal of sludge generated at the Sewage Treatment Facility; and
d. operator training standards and plans.

3. The Licensee shall submit to the Board for approval by June 30, 2012 a Municipal Solid Waste Operations and Maintenance Plan in accordance with , for exemple, the *Guideline for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest* Territories, *April 2003* developed for The Department of Municipal and Community Affairs, Government of the Northwest Territories.

4. The Licensee shall implement the Spill Contingency Plan, the Sewage Treatment Plan, and the Municipal Solid Waste Operations and Maintenance Plan as and when approved by the Board.

5. The Licensee shall review the Spill Contingency Plan, the Sewage Treatment Plan, and the Municipal Solid Waste Operations and Maintenance Plan annually, and shall modify the plans as necessary to reflect changes in operation and technology or any other changes that may be required by an Inspector. The proposed changes shall be submitted to the Board for approval.

PART F: CONDITIONS APPLYING TO MODIFICATIONS

1. The Licensee may, without written approval from the Board, carry out Modifications to the Water Supply Facilities or Waste Disposal Facilities provided that such Modifications are consistent with the terms of this Licence and the following requirements are met:
    a. the Licensee has notified the Board in writing of such proposed Modifications at least sixty (60) days prior to beginning the Modifications;
    b. such Modifications do not place the Licensee in contravention of either the Licence or the *Act*;
    c. the Board has not, during the sixty (60) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and
    d. the Board has not rejected the proposed Modifications.

2. Modifications for which the conditions referred to in Part F, Item 1 have not been met may be carried out only with written approval from the Board.

3. The Licensee shall provide to the Board site plans of the Modifications referred to in Part F, Item 1 within ninety (90) days of completion of the Modifications.

PART G: CONDITIONS APPLYING TO CONSTRUCTION

1. Prior to construction of any dams, dykes or structures intended to contain, withhold, divert or retain water or Waste, other than as contemplated in an approved Spill Contingency Plan, the Licensee shall submit to the Board a rationale and design

drawings.

2. Construction of designed structures as described in Part G, Item 1, shall be carried out as approved by the Board.

3. As-built drawings of the dams, dykes or structures shall be stamped by a qualified engineer registered in the Northwest Territories and submitted to the Board within ninety (90) days of completion of construction.

4. Any fill material used in the construction of any structures as described in Part G, Item 1, shall be clean and free of contaminants.

PART H. CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION

1. The Licensee shall submit to the Board for approval an Abandonment and Restoration Plan at least six (6) months prior to abandoning any Water Supply, Sewage or Solid Waste Disposal Facilities. The Plan shall include, but not be limited to, the following:

    a. contaminated site remediation;

    b. the potential for groundwater contamination (leachate prevention);

    c. consideration of altered drainage patterns;

    d. type and source of cover materials;

    e. future area use;

    f. hazardous waste removal, transportation and disposal;

    g. an implementation schedule; and,

    h. maps delineating all disturbed areas, borrow material locations, and site facilities.

    i. a restoration monitoring plan.

2. The Licensee shall implement the Plan specified in Part H, Item 1 as and when approved by the Board.

NORTHWEST TERRITORIES WATER BOARD

Chair **Witness**

NORTHWEST TERRITORIES WATER BOARD

LICENSEE: Incorporated Hamlet of Tuktoyaktuk

LICENCE NUMBER: N7L3- 0714

EFFECTIVE DATE OF LICENCE: *******

EFFECTIVE DATE OF SURVEILLANCE NETWORK PROGRAM: *******

SURVEILLANCE NETWORK PROGRAM

A. Location of Sampling Stations

Station Number	Description
0714-1	Supply line to reservoir
0714-2	Sewage Disposal Facilities at or near the point of effluent discharge
0714-3	Water contained within the Solid Waste Disposal Facilities at or near the point of effluent discharge

B. Sampling and Analysis Requirements

1. Water at Station Number 0714-2 shall be sampled prior to, and once during each decant and analysed for the following parameters:

   BOD5
   CBOD5
   TSS
   pH
   Faecal Coliforms
   Oil and Grease

2. Water at Station Numbers 0714-2 and 0714-3 shall be inspected monthly during periods of flow for the presence of an oily sheen. If a sheen is detected a sample shall be collected and analysed for the presence of Oil and Grease.

3. Water at Station Number 0714-3 shall be sampled prior to, and once during each discharge of Water from the Solid Waste Disposal Facilities,. Each sample shall be analysed for the following parameters:

pH	Total Suspended Solids
Total Mercury	Total Cadmium
Total Chromium	Total Cobalt
Total Copper	Total Manganese
Total Nickel	Total Lead
Total Iron	Total Zinc
BOD_5	Faecal Coliforms
Polychlorinated Biphenyls	

4. More frequent sample collection may be required at the request of an Inspector.

5. All sampling, sample preservation, and analyses shall be conducted in accordance with methods prescribed in the current edition of "Standard Methods for the Examination of Water and Wastewater" or by such other methods approved by an Analyst.

6. All analyses shall be performed in a laboratory approved by an Analyst.

C. Flow Measurement and Recording Requirements

1. The Licensee shall measure and record in cubic metres the monthly and annual quantities of Sewage discharged to the Sewage Disposal Facilities.

2. The Licensee shall measure and record in cubic metres the monthly and annual quantities of water pumped from SNP Station Number 1531-1 for municipal purposes.

3. The Licensee shall measure and record in cubic metres the monthly and annual quantities of water pumped from the Solid Waste Disposal Facilities.

D. Reports

1. The Licensee shall submit all of the information generated by Part B and Part C of the Surveillance Network Program annually as specified in Part B, Item 1 of the Licence.

NORTHWEST TERRITORIES WATER BOARD

Chairman **Witness**

Appendix B

Contact List

Tuktoyaktuk Municipal Solid Waste Contact Information		
Name	**Position**	**Phone Number**
Terry Testart	Senior Administrative Officer	867.977.2286
Davy Krengnektak	Municipal Services Manager	867.977.2479
Terry Testart	Hamlet Safety Official	867.977.2286
Emergency Contact Information		
Fire Department		867.977.2222
Police (RCMP)		867.977.1111
Medical (Tuktoyaktuk Health Centre)		867.977.2321
Medical (Inuvik Regional Hospital)	Emergency Department	867.777.8160
Hazardous Waste Spill (24 hr)		867.920.8130
GNWT Environment Protection		867.678.6676
Other Contact Information		
Taiga Environmental Services	Lab Services	867.765.6638
GNWT Environmental & Natural Resources		867.678.6690
GNWT Environmental Protection, Inuvik		867.678.6651
NWT Water Board	Regulator	867.678.2942
Inuvialuit Land Administration		867.977.7100
Elias Services of Tuktoyaktuk	Waste Collection Contractor	867.977.2153
AECOM (Yellowknife)	Consultant	867.873.6316

Appendix C

Landfill Policies

Administrative Record Keeping
Automobile Batteries Policy
Empty Container Policy
Environmental Policy
Fire Policy
Litter Control Policy
Ozone Depleting Substances Management Policy
Prohibited Waste Policy
Propane Bottle Policy
Random Load Checking Program Policy
Safe Work Policy
Spill Contingency Policy
Treated Wood Policy
Vehicle Accident Response Policy
Wash Up Policy

HAMLET OF TUKTOYAKTUK

	Policy No.
Facility: Tuktoyaktuk Municipal Solid Waste Facility	**Effective Date:**
Policy: Administrative Record Keeping	**Page:** 1 of 1

Purpose:

To outline the requirements for administrative record keeping.

POLICY:

Records shall be kept of all operational activities including:

- Weekly/Monthly Log
- Monthly Site Operations Inspection Record
- All annual reports
- All incident reports
- All sampling reports

Records shall be kept in the Municipal Services Office for at least the current and previous water licence. Digital copies are preferred and will be backed up regularly.

RESPONSIBILITIES:

1. The SAO will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

HAMLET OF TUKTOYAKTUK

	Policy No.
Facility: Tuktoyaktuk Municipal Solid Waste Facility	**Effective Date:**
Policy: Automobile Batteries Policy	**Page:** 1 of 1

PURPOSE:

To establish the storage and management of automobile batteries for recycling.

POLICY:

1. Automobile and lead batteries will be accepted at the Municipal Yard from residents for recycling purposes.
2. Batteries will be placed at the hazardous wastes temporary storage area.
3. Batteries will not be accepted from commercial businesses.
4. All efforts will be made to encourage customers to separate batteries from other waste.
5. Batteries accepted for recycling will be stored:
   a. On wooden pallets placed over a lime pad
   b. In a sheltered area; and
   c. Covered with a tarp or plastic or placed in a weather-proof structure.
6. Recycling of automobile batteries will be coordinated by the Municipal Services Manager in accordance with contractual agreements.

RESPONSIBILITIES:

.1 The SAO will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

HAMLET OF TUKTOYAKTUK

	Policy No.
Facility: Tuktoyaktuk Municipal Solid Waste Facility	**Effective Date:**
Policy: Empty Container Policy	**Page:** 1 of 1

PURPOSE:

To provide direction to the Municipal Services Manager (MSM) for acceptance and management of empty containers.

POLICY:

1. Empty containers include:
   a. 45 gallon drums;
   b. Grease and oil drums; and
   c. Other industrial containers.
2. Empty containers will only be accepted if:
   a. The top of the container has been removed; and
   b. The container has been cleaned.
3. Containers will not be accepted that:
   a. Are closed and sealed; and
   b. The container holds any liquids.
4. The waste generator or hauler must provide a description of the previous contents of the container and identify if the container has been properly rinsed in accordance with the Northwest Territories Environmental Guideline for the General Management of Hazardous Waste.
5. The MSM may refuse acceptance of any container if the previous contents are not known or if the container has not been properly cleaned.
6. Empty containers that are recyclable will be stored in appropriate storage areas.
7. Empty containers that are not recyclable may be disposed in the Landfill.

RESPONSIBILITIES:

1. The SAO will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

HAMLET OF TUKTOYAKTUK

	Policy No.
Facility: Tuktoyaktuk Municipal Solid Waste Facility	**Effective Date:**
Policy: Environmental Policy	**Page:** 1 of 1

PURPOSE:

To apply “best management” practices with regards to environmental protection.

POLICY:

1. The Senior Administrative Officer will manage the Landfill using due diligence towards development and operations of the Landfill in accordance with regulatory requirements and best management principles.
2. Municipal Works employees and Contractors will endeavour to work according to the operating principles as set out in this policy.
3. “Due diligence” is defined as “the taking of all reasonable steps as part of the due care and attention to prevent the occurrence of an accident or mishap, as well as having a contingency plan to control an incident and limit any consequential damage”. This includes: policy development, checking and corrective action, and management review.
4. Best management practices include:
   a. Good housekeeping
   b. Preventative maintenance
   c. Inspections and record keeping
   d. Security
   e. Employee hiring and training
   f. Reporting of incidents
   g. Operations procedures
   h. Emergency response planning
   i. Identification and assessment of risks
   j. Review and corrective action.

RESPONSIBILITIES:

1. The Municipal Services Manager will be responsible to conduct, or arrange for, routine inspections of the Landfill, operating procedures, and records in regards to this policy.
2. The SAO will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

HAMLET OF TUKTOYAKTUK

	Policy No.
Facility: Tuktoyaktuk Municipal Solid Waste Facility	**Effective Date:**
Policy: Fire Policy	**Page:** 1 of 1

PURPOSE:

To set out emergency procedures for responding to a fire.

POLICY:

1. Upon discovery of fire at the Landfill, the MSM shall call:
   - The Fire Department at 867.977.2222 immediately to report the fire, its location, and the materials that are burning.
   - The MSM shall call the SAO immediately.
   - Contact adjacent property owners, particularly if it appears the fire will go off-site
2. Remove all operating and non-operating persons to a safe location. All non-operating persons shall be escorted to the gates, and the entrance gates are to be closed.
3. Maintain access to the site for Emergency Vehicles throughout the duration of the emergency.
4. Clear the Fire area of all persons, vehicles, and equipment with due consideration to safety.
5. For small fires (i.e. little or no flame present and capable of being extinguished by a portable fire extinguisher), if safe to do so, isolate the burning material from other waste, then extinguish or otherwise contain the fire to one area.
6. If the fire is isolated from other wastes, the fire may be extinguished by either covering it with sand or other soils, or by dousing it with water and covering it with soils.
7. If safe to do so, move flammable materials and wastes away from the fire **OR** cover these materials with sand or other soils to minimize the potential for the fire to spread to these materials.
8. **Do not bury any fire into the working area under any circumstances.**
9. Upon arrival of emergency response vehicles (Fire Truck, Ambulance) the senior staff members, e.g. Municipal Works Employees, on-site shall identify themselves to the Emergency Commander and offer full assistance as requested. Once the Fire Department arrives, the Fire Commander in is full control and landfill staff takes instructions from the Fire Commander.
10. The Landfill operating staff are to remain at the site unless otherwise evacuated or released by the Fire Commander.
11. Following a fire, an incident report is to be completed and an investigation into the cause of the fire is to be conducted by the Municipal Services Manager.
12. Once the fire is extinguished and it is safe to do so, the waste and debris is to be cleaned up and the site operations returned to normal conditions.

RESPONSIBILITIES:

1. The SAO will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

HAMLET OF TUKTOYAKTUK

	Policy No.
Facility: Tuktoyaktuk Municipal Solid Waste Facility	**Effective Date:**
Policy: Litter Control Policy	**Page:** 1 of 1

PURPOSE:
To define litter control methods and responsibilities.

POLICY:

In summary, the following litter control methods are to be followed:

- All delivered loads should be secured;
- Compact waste as soon as practical after being deposited;
- Position wind catchment fences according to the location and configuration of the working area and wind direction;
- Retrieve litter as soon as practical following high wind events;
- Collect litter twice a year, once in the spring and once in the fall;
- Immediately clean up and, if safe to do so, dispose of waste dumped illegally at the site or along access roads; and
- Regularly check ditches along adjacent roads and site access roads and pick up and dispose of spilled or blown litter as required.

RESPONSIBILITIES:

1. The Municipal Services Manager (MSM) is responsible for controlling and litter retrieval of litter escaping from the working area and cleanup of litter on the north side along roads.
2. The MSM is responsible for litter control and cleanup of litter in the recycling compounds.
3. The MSM is responsible for inspecting the Landfill to monitor litter control and cleanup.
4. The SAO will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

HAMLET OF TUKTOYAKTUK

	Policy No.
Facility: Tuktoyaktuk Municipal Solid Waste Facility	**Effective Date:**
Policy: Ozone Depleting Substances Management Policy	**Page:** 1 of 1

Purpose:

To prevent the uncontrolled release of Ozone Depleting Substances from appliances and equipment stored at the Landfill.

POLICY:

1. In this policy, the term "units" applies to all household and commercial appliances and equipment that may contain Ozone Depleting Substances (i.e. CFC's) and may include refrigerators, freezers, and air conditioning equipment, and may also include automobile air conditioners.
2. All units will be inspected prior to acceptance for storage or disposal at the Landfill, and only those units that are tagged by a qualified technician indicating that the CFC's have been purged, may be accepted for storage and recycling.
3. Units that are NOT tagged by a qualified technician indicating that the ozone depleting substances are not purged, the Municipal Services Manager (MSM) may:
   a) Refer the customer to a qualified technician for purging of the ozone depleting substance and tagging of the unit; or
   b) May accept the unit for storage at the Landfill.
4. All untagged units accepted for storage at the Landfill will be stored in an area separate from tagged units and will not be crushed, recycled, or disposed until they are inspected and purged by a qualified technician in accordance with the Ozone Depleting Substances Regulations and appropriately tagged.
5. Units that have been improperly deposited at the working area or at other locations at the Landfill will be separated and inspected for appropriate tags and moved and stored in the appropriate area. In all cases where an untagged unit is identified, attempts will be made to identify the customer and if identified, the appropriate fee will be assessed.

RESPONSIBILITIES:

1. The MSM will be responsible for inspecting all units delivered to the site.
2. The SAO will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

HAMLET OF TUKTOYAKTUK

	Policy No.
Facility: Tuktoyaktuk Municipal Solid Waste Facility	**Effective Date:**
Policy: Prohibited Waste Policy	**Page:** 1 of 1

PURPOSE:
To define waste that is prohibited from disposal at the Landfill.

POLICY:

Prohibited waste is all substances and materials listed below:

- Any household, industrial or commercial hazardous waste;
- Materials contaminated by hydrocarbons that are resistant to, or preclude, biological treatment by Landfill
- Biomedical waste that is not rendered inert
- Asbestos waste
- Radioactive waste
- Combustible waste
- Explosives
- Bulk liquids, defined as any liquid transported in a vehicle tank or body that is not contained in barrels or other such containers, or wastes that do not pass the paint filter test
- Fuel tanks
- Asbestos
- Treated Lumber

1. The Municipal Services Manager reserves the right to determine if a waste is acceptable at the Landfill for storage or disposal. The prohibited waste may include soils or materials containing non-hazardous materials, such as those containing high concentrations of chlorides or other such constituents.

RESPONSIBILITIES:

1. The Municipal Services Manager (MSM) shall be responsible to inspect the site for prohibited debris and to take necessary actions to prevent such waste from entering the Landfill site.
2. The SAO will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

HAMLET OF TUKTOYAKTUK

	Policy No.
Facility: Tuktoyaktuk Municipal Solid Waste Facility	**Effective Date:**
Policy: Propane Bottle Policy	**Page:** 1 of 1

PURPOSE:

To provide guidance for the acceptance and handling of propane bottles.

POLICY:

1. Propane bottles will not be accepted at the Landfill unless the container has been purged or emptied of its contents and the operating valve is in an open position, or if it has been removed from the bottle.
2. If the operating valve is closed, the propane bottle will not be accepted.
3. Empty propane bottles will be stored in the metal recycling area.
4. Propane bottles will not be offered, given, or sold to any person for use, unless that person is qualified to refurbish and certify the propane bottle.
5. All valves will be removed from propane bottles for recycling.
6. Empty propane bottles with removed valves will be recycled through scrap metal dealers if possible, but will otherwise be disposed in the Landfill.

RESPONSIBILITIES:

1. The SAO will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

HAMLET OF TUKTOYAKTUK

	Policy No.
Facility: Tuktoyaktuk Municipal Solid Waste Facility	**Effective Date:**
Policy: Safe Work Policy	**Page:** 1 of 1

PURPOSE:

To protect employees from flying debris, dust, heat, noise, traffic, and other potential hazards.

POLICY:

1. Employees are to be aware of safe work practices and must know how and when to use personal protective equipment.
2. Employees working at the Landfill shall wear appropriate personal protective equipment for specific duties undertaken and in accordance with specific circumstances such as windy conditions, high dust conditions, or other situations that may arise.
3. Personal Protective Equipment to be worn by employees in accordance with the above includes:
   a. Steel toed safety boots (for all field duties)
   b. Safety vest (in the field when out of vehicles or Landfill equipment)
   a. Hard hat (where appropriate to specific duties)
   b. Eye protection (in high wind or dusty conditions)
   c. Ear protection (when operating or working around equipment)
   d. Long pants and shirts (for all field duties) and
   e. Hat (in hot weather)
4. All near misses and accidents must be reported and documented on the Accident and Incident Report Form.
5. Workers exposed to waste should receive and maintain vaccination for Tetanus, Diphtheria (Td) and Hepatitis
   (A and B).

RESPONSIBILITIES:

1. All employees must take responsibility for their own safety and the safety of other employees, customers, and visiting pubic.
2. The Municipal Services Manager (MSM) shall provide input into the Policy and is responsible for enforcing the Policy.
3. The SAO will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

HAMLET OF TUKTOYAKTUK

	Policy No.
Facility: Tuktoyaktuk Municipal Solid Waste Facility	**Effective Date:**
Policy: Spill Contingency Policy	**Page:** 1 of 2

Purpose:

To establish appropriate procedures to follow in the event of a spill that occurs on the Landfill site including the active operations area, storage areas, compost facility, or in buildings or parking areas. This Spill Contingency Policy shall be reviewed annually and revised as necessary to reflect changes in regulations, operations, and technology. Any proposed revisions shall be submitted to the Northwest Territories Water Board (IWB) for approval.

POLICY:

1. Immediately close off and isolate (with a barricade if appropriate) the area of the spill to the public and site employees who are not directly involved in the clean-up of the spill.
2. Identify, if possible, the material involved in the spill. If the material cannot be clearly identified, take note of the nature of the material (i.e. liquid or solid, colour, odour, original container, approximate amount, presence of vapours or fumes, or any other distinguishing features).
3. Direct traffic away from the spill area.
4. The Municipal Services Manager (MSM) shall coordinate the clean-up of the spill.
5. Control the source of the spill first then work on containing the spill using earth berms or other appropriate means.
6. For large spills, berm drainage ditches in the vicinity of the spill to prevent release of the material off-site.
7. Recover the spilled material and contaminated soils and deposit into an appropriate container for proper disposal. **DO NOT HANDLE CHEMICALS**.
8. Conduct personal decontamination if a chemical is spilled upon a person:
    - Remove and dispose of contaminated outer coveralls or personal clothing
    - Utilize emergency eye wash and shower station if required
    - Re-dress in cloth coveralls or a change of clothes that is kept on hand; and
    - If contaminated clothing cannot be washed safely, discard it.
9. If uncomfortable or hazardous fumes, bioinfectious, or radioactive materials are involved, follow evacuation procedures immediately and call Municipal Services / Works at 867.977.2286 or 867.977.2479. Explain to the emergency operator the situation, identify the material (if possible) and provide as much information about the substance as possible such as liquid, solid, colour, quantity, or odours, and the location of the material on the site.
10. If outside fuel or oil storage tanks leak, contact a vacuum truck operator to vacuum up the free liquid product and use a spill kit to clean up any residue. Oil or fuel soaked soil should be excavated and properly handled through the biodegradation facility or other proper disposal.
11. Contact the GNWT Environmental Protection, Inuvik location at (867) 678-6676.

	Policy No.
Facility: Tuktoyaktuk Municipal Solid Waste Facility	**Effective Date:**
Policy: Spill Contingency Policy	**Page:** 2 of 2

RESPONSIBILITIES:

1. The MSM shall be responsible for carrying out spill containment in the active landfill operating area.
2. The MSM shall be responsible for advising Environmental Protection Service, as necessary.
3. The SAO shall be responsible for the review and update of this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

HAMLET OF TUKTOYAKTUK

	Policy No.
Facility: Tuktoyaktuk Municipal Solid Waste Facility	**Effective Date:**
Policy: Vehicle Accident Response Policy	**Page:** 1 of 1

Purpose:

To establish appropriate response in the event of a vehicle accident at the landfill site.

Policies:

All vehicle accidents should be reported and an investigation into the cause of the accident should be carried out. In the event of a vehicle accident, the following actions should be taken:

1. Alert the MSM of the accident.
2. If the damage to the vehicle(s) is minor, the MSM may instruct the individual(s) involved in the accident to report to the RCMP station.
3. If the damage is major, the MSM is to call the RCMP.
4. Secure the site for safety and for follow-up investigation.
5. Traffic is to be directed around the scene of the accident.
6. If the vehicle accident results in any injuries, the injured person(s) should be provided with any assistance required as set out in the Medical Emergencies Response Policy.
7. Assist Health and Social Services (HSS) and the Police with any investigation that is undertaken.
8. Complete the Incident Accident Form.

Responsibilities:

1. The SAO will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

HAMLET OF TUKTOYAKTUK

	Policy No.
Facility: Tuktoyaktuk Municipal Solid Waste Facility	**Effective Date:**
Policy: Wash Up Policy	**Page:** 1 of 1

Purpose:

To establish appropriate hygiene for operations staff at the Landfill.

POLICY:

Hands **MUST BE** thoroughly washed before handling or consuming **ANY FOOD OR BEVERAGE**. Food and beverage is to be consumed only in the Maintenance Area, another area designated by the Landfill Operator, or **OFF-SITE**.

Hands **MUST BE** thoroughly washed before **SMOKING**.

Hands must be thoroughly washed **BEFORE LEAVING** the landfill site for any reason, except in the case of an emergency when the site must be quickly evacuated.

Exterior clothing worn while working around any special wastes **MUST BE** must be removed prior to leaving the site.

RESPONSIBILITIES:

1. The SAO will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

Appendix D

Spill Contingency Plan

Environment

The Hamlet of Tuktoyaktuk

Spill Contingency Plan

Prepared by:

AECOM
200 – 6807 Railway Street SE
Calgary, AB, Canada T2H 2V6
www.aecom.com

403 254 3301 tel
403 270 9196 fax

Project Number:

60250472

Date:

September, 2015

Statement of Qualifications and Limitations

The attached Report (the "Report") has been prepared by AECOM Canada Ltd. ("Consultant") for the benefit of the client ("Client") in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations");
- represents Consultant's professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to Consultant which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time.

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This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

AECOM: 2014-01-06

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Appendices

1. Introduction and Project Details

1.1 Introduction

Municipality Name: The Hamlet of Tuktoyaktuk

Site Name: Tuktoyaktuk, NT

Site Location: 69° 27' N and 133° 02' W

Effective Date of Plan: September 15, 2015

Plan Revisions: Revision v3 dated September 15, 2015

Distribution List: AECOM, NWT WB, AANDC

Purpose of the Plan: This spill contingency plan describes the proper responses to several types of spills that may occur in the operations and activities of the Hamlet of Tuktoyaktuk, NT (hereinafter referred to as “the Hamlet”). Included in the plan is a spill response Contact List for the Northwest Territories, and the reporting requirements in the event of a chemical, fuel, or hazardous waste spill.

2. Community Brief

The Hamlet of Tuktoyaktuk (or Tuktuujaartuq, “looks like a caribou”) is located on Kugmallit Bay near the Mackenzie River Delta. Tuktoyaktuk is accessible by plane, or seasonally by ice-road. The 137 kilometre (km) all season Inuvik-Tuktoyaktuk Highway (ITH) is currently under construction and is scheduled for completion in 2017-2018.

Tuktoyaktuk is the most northern community on Canada’s mainland. Prior to 1900, the area was home to many Inuit whalers, but this original population was badly hit by years of influenza epidemics brought by American whalers. Eventually Alaskan Dene people and inhabitants of Herschel Island settled in the area. A Hudson’s Bay trading post was built in 1928, and in the 1950s Tuktoyaktuk became a supply base for the Cold War DEW Line. Today, many community residents work in oil and gas, and transportation (i.e., Inuvik-Tuk Highway), support local tourism and Arctic research, or practice traditional economic activities such as hunting and trapping.

Table 2-1 below presents a brief profile of the community including size, terrain, climate and socio-economic characteristics.

Table 2-1. Profile of Tuktoyaktuk

Category	Description
Location:	69° 27' N and 133° 02' W
Population:	962 (2014 NWT Bureau of Statistics)
Residences:	265 (2014 NWT Bureau of Statistics)
Proximity:	137 km north of Inuvik, 1130 km northwest of Yellowknife
Weather:	Annual Daily Average = -10.2°C July Daily Average = 11.0°C and January Daily Average = -26.6°C (Canadian Climate Normals 1981-2010)
Precipitation:	7.49 cm of rainfall and 10.31 cm of snowfall annually
Vegetation:	Surrounding vegetation consists of moss, peat, grasses, lichens, and small bushes of willow and Labrador Tea. Small flowering plants are common in summer (GNWT, 1982).
Transportation:	Accessible by air year-round, or by ice road from Inuvik or Aklavik in winter. All season road from Inuvik to Tuktoyaktuk is expected to be completed in 2017/18 winter season.
Economy:	Major industries include transportation, petroleum exploration, tourism and traditional trapping and hunting
Services:	Public School, Health Centre, RCMP Station, etc.
Geology/Terrain:	Terrain around Tuk is flat, barren tundra dotted with shallow lakes and pingos. Permafrost is continuous, with an active layer generally less than 0.5 m. The peninsula under the community is coarse sand, silt, clay and gravel with interbedded ice lenses, formed from erosion material.

3. Infrastructure Descriptions

This section provides an overview of Tuktoyaktuk's water supply and waste disposal systems. **Figure 3-1** shows the locations of the water and waste management infrastructure described below.

3.1 Water Supply

The Hamlet's potable water supply system consists of the following elements:

- Seasonal raw water supply from Kudlak Lake
- Raw water storage reservoir
- Water treatment facility and truckfill station
- Trucked water delivery

3.1.1 Seasonal Raw Water Supply

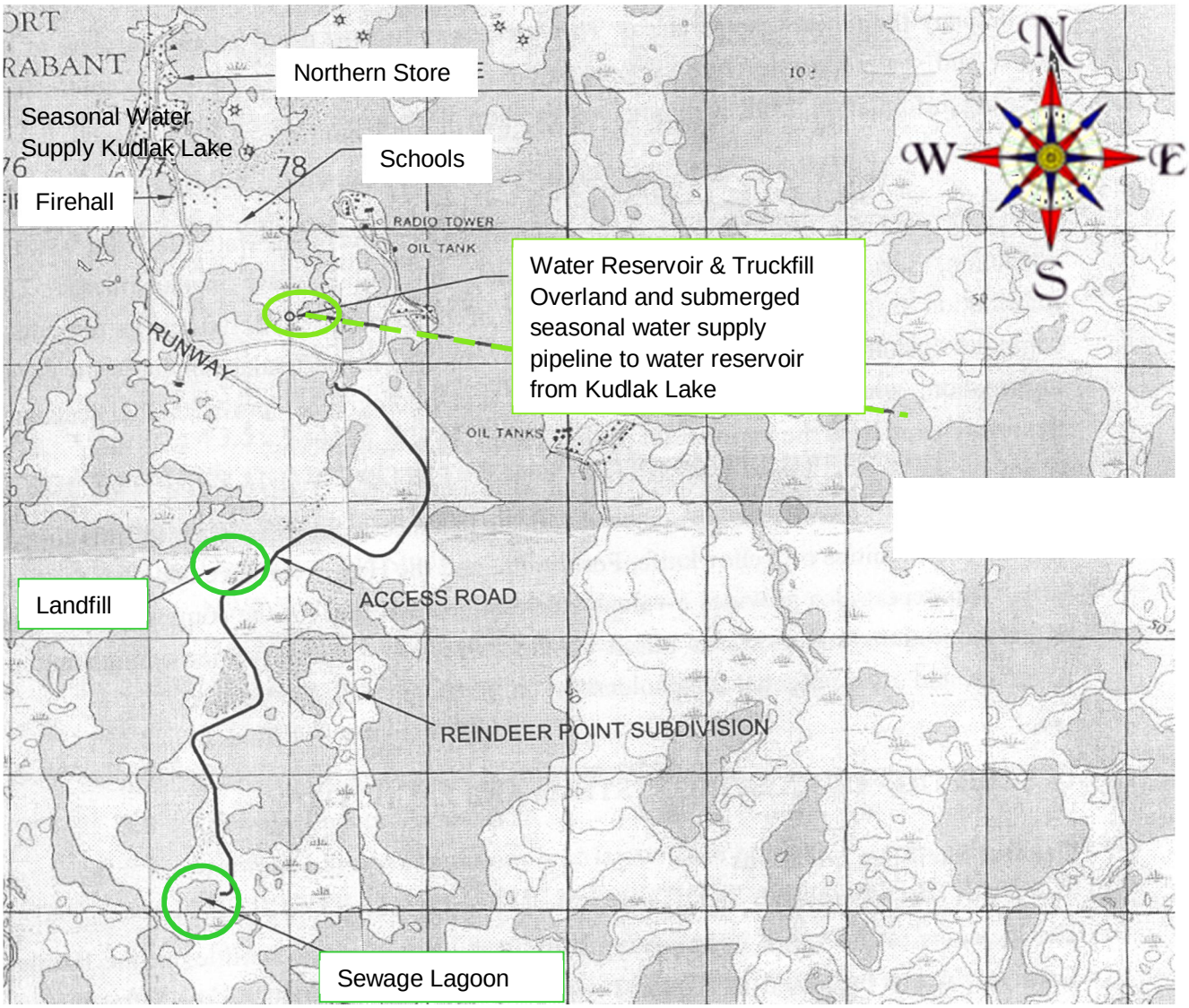
Tuktoyaktuk's raw water comes from Kudlak Lake, a shallow lake located approximately 5.5 km east of the community centre and 4.5 km east of the raw water reservoir. Tuktoyaktuk's raw supply water is of good chemical quality for domestic use. The water is clear, moderately hard, well buffered, slightly alkaline, and has a moderate amount of dissolved solids.

In winter, the lake freezes deep enough that obtaining water from the lake is difficult and water quality is poor. The Hamlet uses a raw water storage reservoir to hold water for use during winter months.

The community obtains water from the lake via a high-density polyethylene pipeline. This intake line is partially submerged under Tuktoyaktuk Harbour and runs along the ground surface for the overland distance to the raw water reservoir. The intake line was replaced in October 2006 with a new 200 millimetre (mm; 8") diameter pipe after the old 100 mm diameter pipeline broke in the summer of 2006.

The water pumphouse at Kudlak Lake was relocated south of the previous location in April 2007.

Figure 3-1. Facility Locations



3.1.2 Water Storage Reservoir

The water reservoir, built in 1984, is an earth structure with a capacity of approximately 90,300 cubic metres (m³). The reservoir characteristics are presented in **Table 3-1** below.

Table 3-1. Tuktoyaktuk Water Reservoir Characteristics

Characteristic	Description
Maximum Reservoir Capacity	94,300 m³
Usable Volume Under Ice	53,100 m³
Maximum Water Depth	7.0 m
Design Ice Thickness	2.1 m
Dead Storage Depth	0.5 m
Freeboard	1.3 m
Full Reservoir Water Surface Dimension	102 m in diameter
Inside Slope	4:1
Liner	0.8 mm CPE with sand cover

The design capacity of the water reservoir is equivalent to consumption by 1,900 community residents and 250 camp residents.

The raw water storage reservoir is filled to capacity in the late summer of each year. This filling procedure usually takes about a week of continuous pumping of water from Kudlak Lake.

3.1.3 Water Treatment and Truckfill Station

Prior to 2009, water was treated by chlorinating with calcium hypochlorite (powdered form of chlorine) during truckfill.

A new water treatment plant and truckfill station was constructed in 2009 by Corix Water Systems. The new water treatment process includes 50 micron cartridge filters, a pressure filter, UV reactors applying a 40 mJ/cm^2 dose, and a chlorine contact chamber.

3.1.4 Distribution

Water is distributed throughout the community using water trucks operated by a private contractor. Two trucks operate seven days per week, filling individual building water tanks. Most of the existing houses have small tanks that are filled daily. Each truck has a capacity of 15, 890 litres (L.) Water deliveries are metered at the truck.

3.2 Sanitary Sewage Facility

Tuktoyaktuk's sewage is collected using trucked pumpout services. The sewage is treated at a sewage lagoon, which is located approximately 3.9 km due south of the Airport Terminal Building.

3.2.1 Trucked Sewage Pumpout

Sewage is collected by a local contractor using 15,890 L vacuum trucks. Two trucks operate seven days per week. The sewage is transferred from holding tanks in each building to a retention lagoon approximately 5 km south of the community via an all-weather gravel road.

3.2.2 Lagoon Access Road and Sewage Truck Discharge Area

The access road to the sewage lagoon is an all-weather gravel road which exits the Reindeer Point subdivision access road. The access road leads to the truck discharge area at the north end of the lagoon. A seasonal access road extends to the south end of the lagoon.

The truck discharge area consists of a gravel area with two gravel ramps leading to a steel chute and pipe system for the discharge from the vacuum trucks. The vacuum trucks discharge by elevating the tank at the front end of the truck, and opening a valve at the back of the truck.

The dispersion structures at the sewage lagoon consist of a timber retaining wall and a metal ramp from the base of the retaining wall into the lagoon. The metal ramp provides a means of effluent dispersion into the lagoon and provides erosion protection to the retaining wall.

3.2.3 Sewage Lagoon

The Hamlet's sewage lagoon is located approximately 5.8 km due south from the Hamlet Office, or 3.9 km south of the Airport Terminal Building, and 1.5 km southwest of the Reindeer Point subdivision.

The sewage retention lagoon provides 365-day retention to treat the sanitary sewage generated by the community. This is a secondary sewage treatment facility. The facility is a 5.9 hectare natural lake that has been modified with a perimeter berm at the south edge to provide the necessary retention capacity. The lagoon has sufficient capacity for a population of 1,900 community residents and 250 camp residents, assuming only domestic use.

3.2.4 Lagoon Effluent Discharge

The sewage lagoon is discharged in the early fall of each year to a saltwater inlet. Fall discharge ensures that the sewage receives the maximum possible natural aerobic treatment within the lagoon provided by sunlight, warm temperatures, and wind in the summer.

The seasonal discharge point is located on the constructed berm at the south edge of the lagoon, 3.0 km directly southeast from the open ocean of Kugmallit Bay and approximately 6.5 km from the ocean by way of the inlet channels. Discharge is accomplished by pumping effluent over the berm.

Over the recent water licence term, the Hamlet has collected samples from the sewage lagoon (SNP 0714-2) and the run-off lagoon at the landfill (SNP 0714-3) during summer and fall months. Data is available from Taiga labs for the number of samples shown in **Table 3-2**.

Table 3-2. Lagoon Effluent Sampling Summary

SNP Sampling Location	Number of Samples with Available Data			
	2005	2006	2007	2008
0714-2 (Sewage Lagoon)	6	2	4	1
0714-3 (Runoff Lagoon at Landfill)	1	3	1	0

The following tables show the average sample results for the sewage lagoon and solid waste lagoon, along with the operating parameter requirements of the Hamlet's Water Licence.

Table 3-3. Results of Sewage Lagoon Effluent Sampling

Parameter	Units	Licence Requirement	Average Sample Result
BOD_5	mg/L	120 (MAC)	28
TSS	mg/L	180 (MAC)	92
pH		6 to 9	7.93
Oil / Grease Sheen		None visible	None visible
Fecal Coliforms	CFU/100mL	No requirements	11000

Table 3-4. Results of Solid Waste Run-off Lagoon Effluent Sampling

Parameter	Units	Licence Requirement	Sample Result (2012)
BOD_5	mg/L	120 (MAC)	10
TSS	mg/L	180 (MAC)	6
Polychlorinated Biphenyls (PCBs)	µg/L	25 (MAC)	<0.1
pH			8.36
Fecal Coliforms	CFU/100mL		55
Cadmium	µg/L		<0.05
Cobalt	µg/L		<0.01
Chromium	µg/L		0.8
Copper	µg/L		<0.02
Iron	µg/L		391
Mercury	µg/L		<0.01
Manganese	µg/L		7.4
NIckel	µg/L		2.2
Lead	µg/L		<0.01
Zinc	µg/L		6.6

3.3 Solid Waste Facility

Tuktoyaktuk's solid waste is collected by truck and transported to the solid waste landfill, approximately 3 km south of the Hamlet. The landfill site consists of the following components:

- Perimeter fence and access roads to landfill areas
- Active municipal waste disposal area (east area)
- Bulky waste disposal area (south area)
- Remediated disposal areas
- On-site drainage retention system

3.3.1 Solid Waste Collection and Site Access

Solid waste collection is done by truck under contract to the Hamlet. Collection currently involves two trucks operating seven days per week.

The Solid Waste Disposal site is accessed from a gate along the all-weather road to Reindeer Point. This entrance provides access to the bulky waste area, the hazardous waste storage area, and storage shed for the Hamlet's caterpillar tractor. The gate is normally closed to provide security for the caterpillar tractor.

The landfill site is surrounded by a 1200 metre (m) perimeter fence on the inland side of the site. The ocean-facing side of the landfill, to the west, is not fenced.

3.3.2 Solid Waste Disposal Facility

The Tuktoyaktuk Solid Waste Disposal site is a large fenced-in facility, approximately 3 km south of the Hamlet. It has been in operation since the early 1970s as a replacement to the dump formerly located at the end of the community airstrip. The facility covers an area of approximately 20 hectares, but not all of the area is currently in use.

The municipal waste area occupies an area approximately 70 m wide and 50 m long. There are designated areas for separation of municipal solid waste, metal, white goods, tires. Hazardous waste is stored at the municipal yard. The municipal waste area is used by both the community and the local industries with no direct fee charged. Access to the site is not controlled and the site is not manned.

The Hamlet was operating a bulky metal waste area approximately 100 m wide by 100 m long. This area was remediated with complete cover in 2004.

Several old landfill areas were remediated in the north, southwest and east portions of the landfill site. These areas have been covered, and have limited vegetative cover in the north and southwest areas and substantial vegetative cover in the east area.

The existing landfill is scheduled to cease operation and is a listed priority site of the Government of Northwest Territories (GNWT) and Aboriginal and Northern Development Canada (AANDC) for closure. A new landfill site located approximately 17 km southwest of the community has been designed and approved and construction was initiated in 2015. As of this writing, Phase 1, including a landfill cell and access road to the site, has been completed. Phase 2, including fencing, gate, and buildings is underway. Final operations will be contingent upon receipt of final permission for direct access to the new ITH.

3.3.3 Solid Waste Disposal Facility On-site Drainage Retention and Control Berm

Most of the surface area of the Solid Waste Disposal facility is covered by a lagoon containing surface runoff from the landfill. The surface runoff lagoon is retained by a 250 m long gravel and clay berm on the eastern edge of the landfill site.

The berm does not have any discharge control structure, so water that accumulates from spring melt and rain is pumped over the berm into the ocean periodically. The perimeter berm also prevents the ingress of the ocean.

3.3.4 Water Pollution

The pollution factors associated with the landfill include surface water pollution, and subsurface water pollution. Surface water pollution is a concern which is managed with the on-site runoff collection within the landfill area.

4. Water Licence Compliance Inspections and Annual Reports

This section summarizes the information from past AANDC inspection reports and the Hamlet's annual reports. All Water Licence renewals, amendments, annual and inspection reports are available in the Northwest Territories Water Board Public Registry.

4.1 Water Licence and Amendments

The Hamlet of Tuktoyaktuk currently holds Water Licence N7L3-0714 from the NWT Water Board, for municipal water use up to 100,000 m^3/year and municipal waste disposal. The Licence was first issued to the Hamlet in 1984 for water use up to 150,000 m^3/year and waste disposal.

Table 4-1. Summary of Water Licence Periods

Effective Date	Expiry Date	Licence #
November 19, 2013	June 30, 2014	N7L3-0714 (renewal)
April 23, 2010	November 20, 2013	N7L3-0714 (renewal)
June 28, 2005	June 27, 2009	N7L3-0714 (renewal)
April 30, 2002	April 29, 2005	N7L3-0714 (renewal)
March 1, 2000	April 29, 2002	N7L3-0714 (extension)
March 1, 2000	February 28, 2002	N7L3-0714
January 1, 1997	February 29, 2000	N7L3-0714 (extension)
September 11, 1997	December 31, 1999	N7L3-0714 (amendment)
January 1, 1997	December 31, 1999	N7L3-0714
March 1, 1994	February 28, 1997	N7L3-0714
March 1, 1984	February 28, 1994	N7L4-0714

4.2 Water Licence Annual Reports

The Hamlet did submit annual reports during the years 2008, 2011, and 2012.

The Hamlet's average water use from 2008 to 2012 was 48,053 m^3 per year, or 145 litres per capita per day.

SNP sampling results, as summarized in the annual reports, indicate that the sewage lagoon and solid waste disposal run-off lagoon are operating within the water licence parameters.

4.3 Water Licence Compliance Inspection Reports

A Water Licence inspection was done in 2013 by inspectors from AANDC.

5. Recent and Planned Improvements

Some modifications to the water licence infrastructure since the last water licence renewal (November 2013) include:

- A new solid waste landfill has been approved by the EISC in 2014 and construction initiated in 2015
- The new landfill is expected to commence operations contingent upon receipt of final permission to access the new ITH.

6. Response Organization

6.1 Spill Response Responsibilities

The following is a primary list of contacts for spill response.

Organization	Contact	Phone Number
Northwest Territories 24 Hour Spill Report Line		867-920-8130
NWT Water Board	Mardy Semmler	867-678-2942
GNWT Environment Protection, Inuvik (ENRP)	Philippe Thibert-Leduc	867-678-6676
GNWT Environment & Natural Resources, Inuvik	Stephen Charlie	867-678-6690
Inuvialuit Land Administration (Env. Mgmt.)	Shawna Wilson	867-977-7100

6.2 Spill Reporting Procedures

All spills regardless of quantity will be reported to the Hamlet Management, GNWT Environment Protection Inspector and the NWT/NU Spill Line where the release:

- Is near or into a water body
- Is near or into a designated sensitive environment or sensitive wildlife habitat
- Poses an imminent threat to human health or safety; or
- Poses an imminent threat to a listed species at risk or its critical habitat

If applicable a detailed report including GPS location must be submitted to the GNWT Environment Protection Inspector no later than 30 days after the initial report for any occurrence.

The NT/NU Spill Report Form is provided in Appendix A and will be kept with a copy of the Spill Response Plan at all areas where potentially harmful substances or fuel are stored or transferred and extra copies will be available with the Hamlet Management.

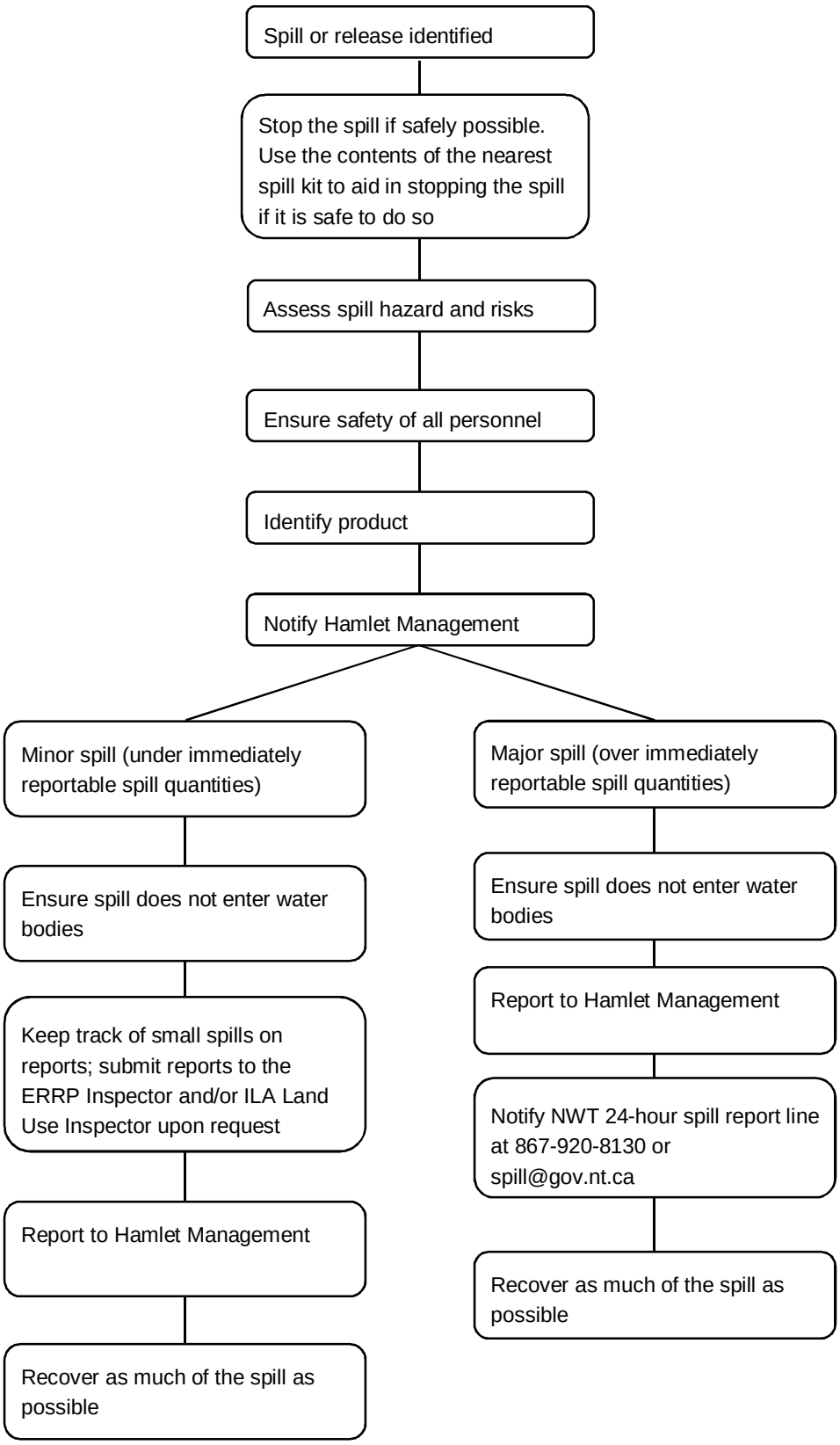
6.3 Initial Spill Response Actions

- Ensure safety of all personnel.
- Assess spill hazards and risks.
- Remove all sources of ignition.
- Stop the spill if safely possible (e.g. shut off pump, replace cap, tip drum upwards, patch leaking hole). Use the contents of the nearest spill kit to aid in stopping the spill if it is safe to do so.
- No matter what the volume is, notify Hamlet Management.
- Contain the spill - use contents of spill kits to place sorbent materials on the spill, or use shovel to dig to contain spill. Methods may vary depending on the nature of the spill.
- Relay information to internal company contacts, government agencies and, if required, the designated Communications representative.
- If needed workers will be evacuated or diverted from the spill area.
- If the spill involves petroleum products, all sources of ignition will be eliminated from spill area, and the area will be evaluated for risk of fire or explosion.
- Personal Protective Equipment (PPE) will be used until concentrations are determined to be within acceptable levels.
- If the area is deemed hazardous, it will be marked, flagged and ribbon off.

- Ground and Weather conditions will be evaluated to assess the risk to environment. (Rain, gravel, sand, water body, muskeg, etc.)
- Leak location will be identified, the type of leak, the duration and the volume release, and reported to the Hamlet Management who will advise the authority having jurisdiction.
- Monitor the air at the perimeter of the flagged off area as necessary.
- In the event of a large spill, or a spill in a watercourse, the spill will be evaluated for: possibility of migrating, anticipated direction of migration, how far can it go, what lands or water bodies may be affected. This information will be collected and provided to the Hamlet Management and authorities having jurisdiction.
- The spill will initially be contain and then cleaned up using appropriate methods.
- For large spill or in a watercourse, the access to the spill and the recovery points will be established as well as the equipment required to perform the cleanup operation.
- Minimize vehicular traffic as much as possible at the spill site.
- The spill site may be cordoned off to prevent wildlife from entering.

Spills of hazardous materials in the NWT present a potential threat to the public interest and environment. Agencies responsible for conducting spill investigations and monitoring clean-up of spills have signed an agreement to promote a well-coordinated state of preparedness for these activities.

6.4 Flowchart of Response Organization



6.5 Designation of Lead Investigating Agency for Spill on Land in the NWT:

- The GNWT, Department of Environment and Natural Resources (ENR) is the lead agency in dealing with spills on lands and facilities in the Northwest Territories
- The National Energy Board (NEB) is responsible for spills at oil and gas exploration and production facilities
- The Inuvialuit Land Administration (ILA) is responsible for spills on land in the NWT set aside under the Inuvialuit Land Claim Agreement

6.6 Designation of Lead Agency for Spills on Water in NWT:

- The Government of the Northwest Territories, Department of Environment and Natural Resources (ENR) is the lead agency responsible for spills on water in the NWT.
- Transport Canada is the Lead Investigating Agency for all ship source spills
- The Canadian Coast Guard is the Lead Response Agency ensuring spills from ships and barges (including Oil Handling Facility re-supply) and unreported spills on water are addressed.
- The National Energy Board is responsible for spills on water at oil and gas exploration and production facilities.

7. Spill Response Training

The Hamlet is committed to ensure all personnel involved in a spill response fully understand their roles and the roles of others whom they may interact with during an incident. To meet this commitment and to ensure personnel respond effectively, training activities will include the following.

7.1 Orientation

- Provide employees and contractor personnel with an orientation to the Spill Contingency Plan and its applicable elements
- Discuss and clarify bridging between contractors' emergency response procedures and this Spill Contingency Plan where applicable
- Utilize summary wall charts outlining key responsibilities and lines of communication for quick reference purposes
- Devote a portion of scheduled safety and/or staff meetings to discussion of spill response issues on and on-going basis

7.2 Specialized Spill Response Training

- Make available (through the Hamlet Management) all required training
- Ensure employees and contractor personnel comply with the Hamlet's safety training requirements (e.g. First Aid/CPR, Workplace Hazardous Materials Information System (WHMIS), Transportation of Dangerous Goods, Firefighting, etc.)

7.3 Spill Drills

Employees and contractors should conduct drills on an on-going basis to ensure readiness.

7.4 External Orientation

As appropriate, brief and familiarize all external groups or agencies having a role in this Spill Contingency Plan with the overall plan and their specific responsibilities under the plan.

8. Action Plan in the Event of a Spill

This section contains an outline of the steps to take for reporting, clean-up, and disposal of any spilled contaminants and contaminated soil or water.

8.1 Potential Environmental Impacts of Spill

8.1.1 Gasoline

Environmental impacts: Gasoline may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Gasoline is quick to volatize. Runoff into water bodies must be avoided.

Worst case scenario: All tanks or drums were punctured or open simultaneously and contents seeped into surrounding soil and water bodies. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

8.1.2 Diesel Fuel

Environmental impacts: Diesel may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Diesel burns slowly and thus risk to the environment is reduced during recovery as burn can be more readily contained compared to volatile fuels. Runoff into bodies of water must be avoided.

Worst case scenario: All fuel tanks and drums were punctured or open simultaneously and contents seeped into surrounding soil and water bodies. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

8.1.3 Aviation Fuel

Environmental impacts: Aviation fuel may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bio accumulation in the environment. Aviation fuel volatizes relatively quickly. Runoff into water bodies must be avoided.

Worst case scenario: All fuel drums were punctured or open simultaneously and contents seeping into surrounding soil and water bodies. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

8.1.4 Propane

Environmental impacts: Propane may be harmful to wildlife and surrounding environment. It has the potential to accumulate in the environment. Propane is extremely volatile and is the most flammable material stored on site, thus immediate impacts to the surrounding environment are a concern.

Worst case scenario: All cylinders were punctured or failed simultaneously and contents leaked into the surrounding environment and ignited leading to an explosion. This could cause serious environmental impacts in the immediate surroundings. Safety during emergency response to a propane spill is the utmost concern.

8.2 Specific Spill Containment Methods

8.2.1 Spill Assessment (Land)

Following the initial hazard assessment and development of a site safety plan, gather detailed information on the location and effects on the spill on the land base.

Identify and document the spill boundary with the appropriate equipment, including:

- Personal Protective Equipment (PPE)
- Gas detection monitors
- Compass
- Measuring device (i.e. GPS)
- Shovel
- Quantabs or conductivity meter for produced water or emulsion spills
- Hoe, drill or sampling equipment of sub-surface contamination is suspected
- Camera

Use one of the handheld air monitor to confirm there are no flammable vapors in the area. Produce a sketch of the spill and take appropriate photographs. Next, identify land uses in areas affected by the spill. Look at whether the spill affects private land owners, public land (green areas, parks), dispositions (pipelines, utilities, roads, facilities, trappers, etc.), or sensitive areas (protected areas, wildlife habitat, archaeological resources etc.).

Based on the land use in the spilled area, determine the possible public that could be directly impacted; evaluate site for wildlife, and determine the approval requirements for accessing the spill site. It is important to note the terrain, soil types, characteristics and conditions, as well as the vegetation types on site. Surface run-off patterns, erosion potential, moisture levels and movement of the water table can all impact the severity of the spill and the way in which it can be contained so it is imperative to take note of all these things before proceeding with cleanup. When the previous considerations have been addressed, the next course of action is to determine the equipment resources that are required to control the spill. The initial assessment will impact what equipment will be used, how it will be transported to the spill site and how it will improve or create access to the spill.

8.2.2 Land Spills

Land spills will spread outward from the initial spill point toward lower-lying areas. Penetration downward into the soil will also occur at a rate that is dependent on the soil type and the nature of the product spilled. During spills in winter petroleum will spread under the snow making definition of the extent of the spill area difficult.

The Hamlet Management should:

- Attempt to restrict spills on land to as small an area as possible based on site conditions
- Prevent the spill from entering water bodies or flow watercourses or flowing into culverts, within the bounds of safety and practicality

8.2.3 Spill Assessment (Water)

Begin by assessing the characteristics of the affected watercourse including width, depth and velocity. Shoreline characteristics and sensitivities also need to be taken into consideration. The degree of oil impact, degree of sensitivity (ecological, cultural, human use, etc.) and the physical limitations can all affect the way in which a spill will be contained.

Preventing potential impacts on stakeholders can be done by advising downstream water users that contaminated water may pass their intakes. Their reserve water supplies (if any) may permit them to close the intakes until the spilled product passes. Examples of users include area residents, cities and towns.

8.2.4 Spills into a Watercourse

Petroleum products will spread outward from the origin of the spill eventually achieving a stable thickness on the water. Spills on rivers, creeks or streams will flow downstream, contaminating riverbanks and vegetation, affecting wildlife, fish and water users in the area of the spill.

The rate of the spill movement will depend on the current speed of the water and the time of year. Current may flow faster in the deepest channels in the river and slower in the shallower areas, due to varying volumes of water.

Flow in a watercourse will also be faster in the spring because of snowmelt entering from the surrounding area. River currents in summer and fall will be generally slower than in the spring. Wind and wave action will also affect the rate and direction of spill travel.

Spill velocity on a watercourse may be estimated quickly by using a current velocity meter or by timing the movement of a floating object on the watercourse over a set distance.

The velocity calculated will be an approximation only, as the watercourse velocity varies at different points across the river, due to changes in river depth and at various points upstream and downstream on the river. In the initial stages of spill on a watercourse, lighter-end materials will tend to evaporate, especially in warm weather. Other processes that might affect spill behavior include dispersion of the petroleum into the water, formation of stable oil/water emulsions and stranding or oil along the shoreline.

Containment of a spill on a watercourse should be completed as quickly as possible as the spilled material has the potential to travel a much greater distance and contaminate a larger area than spills on land. The Hamlet Management will implement appropriate containment actions based on the size of the watercourse and current velocity.

8.2.5 Spills into Waterbodies

In the absence of any current or wind, spill on water bodies such as lakes will spread out in all directions from the site of the spill until a uniform stable thickness is reached. If a wind and/or current are present, the spill will move with the wind or current until it reaches the shoreline.

Wave action in the water body may also affect the spill causing oil-in-water or water-in-oil emulsions to form, making recover and cleanup efforts more difficult.

The Hamlet Management should attempt to contain the spill to as small an area as possible and the water body near the spill source. Dispersion of the spill over a large area on the water body could cause widespread impacts when the spill reaches the shore. If the spill can be contained on the water body, the spilled material is moved toward shore for recovery.

Containment options for spills on water bodies use a containment boom to surround the spill. If the area that may be impinged by the spilled materials is environmentally sensitive, appropriate shoreline protection measure may be implemented as recommended by the Environmental Specialists.

8.2.6 Spills into Wetlands or Muskeg

Wetlands are areas with high organic content, which contain large amounts of water in the soil. Wetlands may be continuously covered in water or water levels may fluctuate throughout the year. Muskeg is a land area that contains high moisture content and is boggy in the summer because of large quantities of peat, moss, or other vegetative material in the soil. In winter, muskeg will freeze making excavation extremely difficult.

Spills in wetlands or muskeg can be some of the most difficult spills to contain, recover and clean up because of limited site access for both manpower and equipment. Because of the sensitive nature of these ecosystems, more damage may be cause by emergency response operations than was caused by the original spill. The Project Manager may consult with government officials before conducting emergency response operations in wetlands or muskegs. This will ensure that containment, recovery, and cleanup operations represent the most viable option for the spill, based on the type of product, size of spill and site specific safety, operational or environmental concerns.

If all other options are considered unviable, natural recovery may be approved by environmental protection agencies. Natural recovery uses micro-organisms already present in the ecosystem to degrade the oil. Degradation of the oil may be enhanced by addition of other nutrients required by the micro-organisms, to ensure sufficient levels of these nutrients are present to allow degradation to continue.

Natural recovery may be preferable to recovery and cleanup depending on:

- The amount, type and persistence of the oil
- The location of the site
- The nature and uses of the area

Whether the impacts of various cleanup methods are greater than damage related to the actual spill, Natural recovery should be considered if:

- Cleanup activities will cause more harm than leaving the site to recover naturally
- Leaving the area to recover naturally will not cause further harm to environmentally sensitive areas
-

Containment operations for wetland or muskeg spills in winter are similar to those for spills on land or ice. If containment operations are conducted at the site in the summer, a combination of land containment and water containment options will be used as appropriate.

8.3 Chemical Spills

The action plan laid out here is generally applicable to any chemical spills that the Project may deal with, but some chemicals may have special handling and disposal requirements. Refer to WHMIS labels and Material Safety Data Sheets (MSDS) for chemical-specific information.

8.3.1 Initial Action

In the event of a chemical spill, the following measures should be taken immediately:

- Evacuate unnecessary personnel
- Ventilate area of leak or spill (opening all doors and windows)
- Wear personal protective equipment (gloves, safety glasses, impervious material long-sleeved shirt/coat)
- If available wear respirator/self-contained breathing apparatus (SCBA), especially for large spills

- Remove all other chemicals from the area if safe to do so
- For small spills, dilute with water, mop or wipe up and place in proper container
- For large spills, contain by diking (soil/dry sand/kitty litter), absorb with inert material (soil/dry sand/kitty litter) and place in chemical waste container
- After mopping up chemical, wash area well with soap and water, mopping into spill container and not to the ground
- Do not use combustible materials! (i.e. sawdust or cardboard)
- Contain runoff from spill clean-up
- Notify the Northwest Territories twenty-four (24) hour Spill Report Line at (867) 920-8130 and receive disposal information

8.3.2 Follow-Up Action

After the spill has been cleaned up, other reporting, disposal, and follow-up activities may be required. The following measures should be taken if applicable:

- Dispose of chemical, inert absorbent material, and mop-up water as directed by Spill Report Line personnel
- Arrange for repair or replacement of chemical containers, pipelines and equipment, if damaged or leaking
- Submit a detailed report on the occurrence to the GNWT, ENRP Inspector, within thirty (30) days of reporting the event

8.3.3 Spill Kit

A spill kit will be available at the Hamlet storage depot in the event of a chemical spill. The kit should include:

- Heavy-duty gloves
- Safety glasses
- Mop/wringer/spill squeegee
- Shovel/ broom/dustpan
- Chemical spill container with sealable lid
- Sand/kitty litter (absorbent, non-flammable material).

Alternatively, a 50 Gallon Universal Sorbent Spill Kit can be provided, which includes:

- 10 - 3" x 48" socks
- 4 - 3" x 10' socks
- 50 - 15" x 17" pads
- 4 pillows
- 50 wipers
- 5 disposal bags and ties
- 5 tamperproof seals
- 2 pair nitrile gloves
- 1 emergency response guidebook

8.3.4 First Aid

First aid with chemicals is very specific to the materials involved. It is recommended that personnel follow all chemical-specific instructions or call the twenty-four (24) hour Spill Reporting Line for assistance. Below are procedures for caustic or toxic chemicals that may be encountered.

Skin Contact

Immediately flush skin with water for at least 20 minutes while removing all exposed clothing. Get medical attention immediately. Wash all exposed clothing with soap and water and dry before reuse, thoroughly clean exposed shoes.

Inhalation

Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Ensure the person is at rest – no physical exertion. Get medical attention immediately.

Ingestion

If swallowed, **DO NOT INDUCE VOMITING**. If the person is conscious, have the person rinse their mouth with water. Have the person drink large quantities of water. If milk is available, have person drink milk AFTER the water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Information on poison control hazardous chemicals be ingested can be obtained by calling the Tuktoyaktuk Regional Health Services at 867-977-2321 or Inuvik Regional Hospital at 867-777-8000.

Eye Contact

Immediately flush eyes with plenty of water for at least 20 minutes, lifting lower and upper eyelids occasionally at eye wash station. Get medical attention immediately.

8.4 Petroleum Product and Antifreeze Product Spills

Petroleum products have many operational uses and used petroleum product drums or other containers may be present. Petroleum product spills range from minor spills during operations such as gas tank filling, to constant leakage from pipelines in need of repair, to major spills causing large contaminated soil/water issues.

Depending on the location of the spill, a petroleum product spill may result in contaminated soil or water. The contaminated material must be cleaned up and removed for disposal along with the spilled petroleum product.

Antifreeze or engine coolant products are used in automotive engines and generally consist of ethylene glycol or propylene glycol mixed with distilled water; of the two, propylene glycol is significantly less toxic. Like petroleum products and used antifreeze product drums or other containers may cause minor spills to large spills from punctured containers.

Petroleum and antifreeze product spills can be handled in the same manner. Refer to WHMIS labels and MSDS for chemical-specific information.

8.4.1 Initial Action

In the event of a petroleum or antifreeze product spill, the following measures should be taken immediately:

- Shut off ignition sources, if safe to do so
- Identify the spilled material and locate the source
- Stop the spill at the source, if safe to do so
- Take actions to contain/clean up spilled material
- Record relevant information for reporting: this includes quantity of material spilled, product type, location, date, weather, and other relevant information
- Notify the Northwest Territories 24 hour Spill Report Line at (867) 920-8130 and receive disposal information.

8.4.2 Follow-Up Action

After the initial clean-up and reporting procedures, other activities may be required such as reporting and disposal. The following measures should be taken if applicable:

- Dispose of soil in the onsite Petroleum Hydrocarbon Contaminated (PHC) soil Treatment facility if appropriate or offsite with the excavated heavy end PHC soil and metals contaminated soils
- Arrange for repair or replacement of petroleum product containers, pipelines and equipment, if damaged or leaking
- Submit a detailed report on the occurrence to the GNWT ENRP Inspector, within thirty (30) days of reporting the event
- For large spills, install wells to monitor the groundwater for signs of contamination. Determine the level of final clean-up in consultation with the GNWT ENRP inspector

8.4.3 Spill Kit

One spill kit should be on-hand at each of the fuel storage areas and in every pick-up truck onsite. The kit should include:

- Heavy-duty gloves
- Safety glasses
- Mop/wringer/spill squeegee
- Shovel/ broom/dustpan
- Chemical spill container with sealable lid
- Sand/kitty litter (absorbent, non-flammable material)

Alternatively, a 50 Gallon Universal Sorbent Spill Kit can be provided, which includes:

- 10–3" x 48" socks
- 4–3" x 10' socks
- 50–15" x 17" pads
- 4 pillows
- 50 wipers
- 5 disposal bags and ties
- 5 tamperproof seals
- 2 pair nitrile gloves
- 1 emergency response guidebook

8.5 Hazardous Waste Management

Hazardous waste, such as used oil, battery acid, antifreeze, etc. must be stored in a safe and secure manner. In general, hazardous waste should be stored according to the following:

- Hazardous waste shall be stored and shipped in certified containers for the material type.
- Hazardous waste is to be stored in a secure area with controlled access. Only persons authorized to enter and trained in waste handling procedures should have access to the storage site.
- Drainage into and from the site is controlled to prevent spills or leaks from leaving the site and to prevent run off from entering the site.
- Regular inspections are performed and recorded. Containers are placed so that each container can be inspected for signs of leaks or deterioration. Leaking or deteriorated containers should be removed and their contents transferred to a sound container.
- Storage sites shall meet all local bylaw and zoning requirements.

Disposal of any Hazardous Waste encountered will be at a licensed disposal facility.

8.6 Classification of Dangerous Goods

The shipper (consignor) is responsible for classifying all dangerous goods that are shipped. Goods classified by the manufacturer should be verified by the shipper. Where the composition of the products has been changed (e.g. mixtures of hazardous waste) the products may need to be reclassified. The carrier is responsible to ensure that the documentation matches the package. All vehicles transporting dangerous goods into, or out of the site should have proper placarding on vehicles. Containers should also be labeled according to the requirements laid out by the TDG Act and Regulations. The shipper (consignor) is responsible for completing the shipping document. The carrier shall ensure that the documents match the package. Persons ordering and receiving dangerous goods shall ensure that shipping documents are sent by the suppliers where required by the TDG Act and Regulations and shall refuse shipments if not in compliance. Documents must be retained for at least two years. A person that handles, offers for transport or transports dangerous goods must be adequately trained and have a training certificate or work under the direct supervision of an adequately trained person. Within each area or department that ships or receives dangerous goods, management shall identify individuals who require transportation of dangerous goods training. Retraining is required every three years. A training certificate must be requested for inspection.

9. Spill Response Contact List

Table 9-1. Contact List

Organization	Contact	Phone Number
Northwest Territories 24 Hour Spill Report Line		867-920-8130
NWT Water Board	Mardy Semmler	867-678-2942
GNWT Environment Protection, Inuvik (ENRP)	Philippe Thibert-Leduc	867-678-6676
GNWT Environment & Natural Resources, Inuvik	Stephen Charlie	867-678-6690
Inuvialuit Land Administration (Env. Mgmt.)	Shawna Wilson	867-977-7100

10. Reporting Requirements

The Hamlet's Water License will require any chemical or petroleum product spill or unauthorized discharge of waste to be reported immediately to both the twenty-four (24) hour Spill Report Line and to the GNWT ENRP Inspector (see contact details in previous section). Spills to be reported include spills that have already occurred, or potential spills that are about to occur. Spills must be reported if the amount is greater than or equal to the amount listed in the GNWT Spill Contingency Planning and Reporting Regulations for each contaminant.

Environment and Natural Resources requires that spills or environmental accidents be reported to the twenty-four (24) hour Spill Report Line.

When reporting a spill to the twenty-four (24) Hour Report Line, give as much of the following information as possible:

- Date and time of spill
- Location of spill
- Direction spill is moving
- Name and phone number of a contact person close to the location of spill
- Type and quantity of contaminant spilled
- Whether spill is continuing or stopped
- Actions taken to contain, recover, clean-up and dispose of contaminant
- Name and phone number of person reporting spill and person in charge of the facility

The Hamlet must also submit to an Inspector a detailed report on the occurrence within thirty (30) days of reporting the event.

A Northwest Territories spill report is included at the back of this plan.

11. Material Safety Data Sheets (MSDS)

Representative Material Safety Data Sheets (MSDS) have been provided in Appendix B. These MSDS are presented for informational purposes only and should not be used for WHMIS purposes; MSDS from the Hamlet's vendors should be acquired and maintained for WHMIS compliance and, if applicable, should replace the sheets in this plan.

The list of contaminants presented above is not intended to be a comprehensive list of potential contaminants the Hamlet might face, but merely present the common contaminants that the Hamlet might encounter on a regular basis. Always review the MSDS for any of any chemical you are unfamiliar with.

12. References

AANDC. "Guidelines for Spill Contingency Planning".

Northwest Territories Water Board. "Guidelines for Contingency Planning" 1987.

GNWT. "Consolidation of Regulation R-068-93 Spill Contingency Planning and Reporting Regulations", 1993.

Appendix A

NT-NU Spill Report Form

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

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

REPORT LINE USE ONLY

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

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

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

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

REPORT LINE USE ONLY

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

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

SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN

FILE STATUS ☐ OPEN ☐ CLOSED

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

Appendix B

Material Safety Data Sheets (MSDS)

MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

EMERGENCY OVERVIEW
DANGER!
EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT - EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF SWALLOWED - ASPIRATION HAZARD

NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

1. CHEMICAL PRODUCT and COMPANY INFORMATION

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

EMERGENCY TELEPHONE NUMBER (24 hrs): **CHEMTREC (800)424-9300**
COMPANY CONTACT (business hours): Corporate Safety (732)750-6000
MSDS (Environment, Health, Safety) Internet Website www.hess.com

SYNONYMS: Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS *

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Gasoline (86290-81-5)	100
Benzene (71-43-2)	0.1 - 4.9 (0.1 - 1.3 reformulated gasoline)
n-Butane (106-97-8)	< 10
Ethyl Alcohol (Ethanol) (64-17-5)	0 - 10
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Tertiary-amyl methyl ether (TAME) (994-05-8)	0 to 17.2
Toluene (108-88-3)	1 - 25
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 - 15

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME).

Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

3. HAZARDS IDENTIFICATION

EYES
Moderate irritant. Contact with liquid or vapor may cause irritation.

SKIN
Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

INGESTION
The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION
Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY
Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

4. FIRST AID MEASURES

EYES
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION
Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

FLASH POINT:	-45 ^{o}F (-43^{o}C)
AUTOIGNITION TEMPERATURE:	highly variable; > 530 ^{o}F (>280 ^{o}C)
OSHA/NFPA FLAMMABILITY CLASS:	1A (flammable liquid)
LOWER EXPLOSIVE LIMIT (%):	1.4%
UPPER EXPLOSIVE LIMIT (%):	7.6%

FIRE AND EXPLOSION HAZARDS
Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA
SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 “Low Expansion Foam - 1994 Edition.”

FIRE FIGHTING INSTRUCTIONS
Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE

HANDLING PRECAUTIONS

******USE ONLY AS A MOTOR FUEL******
******DO NOT SIPHON BY MOUTH******

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION

EXPOSURE LIMITS

Component (CAS No.)	Source	TWA (ppm)	STEL (ppm)	Exposure Limits Note
Gasoline (86290-81-5)	ACGIH	300	500	A3
Benzene (71-43-2)	OSHA	1	5	Carcinogen
	ACGIH	0.5	2.5	A1, skin
	USCG	1	5	
n-Butane (106-97-8)	ACGIH	1000	--	Aliphatic Hydrocarbon Gases Alkane (C1-C4)
Ethyl Alcohol (ethanol) (64-17-5)	OSHA	1000	--	
	ACGIH	1000	--	A4
Ethyl benzene (100-41-4)	OSHA	100	--	
	ACGIH	100	125	A3
n-Hexane (110-54-3)	OSHA	500	--	
	ACGIH	50	--	Skin
Methyl-tertiary butyl ether [MTBE] (1634-04-4)	ACGIH	50		A3
Tertiary-amyl methyl ether [TAME] (994-05-8)				None established
Toluene (108-88-3)	OSHA	200		Ceiling: 300 ppm; Peak: 500 ppm (10 min.)
	ACGIH	20	--	A4
1,2,4- Trimethylbenzene (95-63-6)	ACGIH	25	--	
Xylene, mixed isomers (1330-20-7)	OSHA	100	--	
	ACGIH	100	150	A4

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem ®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE

A translucent, straw-colored or light yellow liquid

ODOR
A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

ODOR THRESHOLD

	Odor Detection	Odor Recognition
Non-oxygenated gasoline:	0.5 - 0.6 ppm	0.8 - 1.1 ppm
Gasoline with 15% MTBE:	0.2 - 0.3 ppm	0.4 - 0.7 ppm
Gasoline with 15% TAME:	0.1 ppm	0.2 ppm

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	85 to 437 ^{o}F (39 to 200 ^{o}C)
VAPOR PRESSURE:	6.4 - 15 RVP @ 100 ^{o}F (38 ^{o}C) (275-475 mm Hg @ 68 ^{o}F (20 ^{o}C)
VAPOR DENSITY (air = 1):	AP 3 to 4
SPECIFIC GRAVITY (H_2O = 1):	0.70 – 0.78
EVAPORATION RATE:	10-11 (n-butyl acetate = 1)
PERCENT VOLATILES:	100 %
SOLUBILITY (H_2O):	Non-oxygenated gasoline - negligible (< 0.1% @ 77 ^{o}F). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 ^{o}F); ethanol is readily soluble in water

10. STABILITY and REACTIVITY)

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID
Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

INCOMPATIBLE MATERIALS
Keep away from strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS
Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

11. TOXICOLOGICAL PROPERTIES

ACUTE TOXICITY
Acute Dermal LD50 (rabbits): > 5 ml/kg
Acute Oral LD50 (rat): 18.75 ml/kg
Primary dermal irritation (rabbits): slightly irritating
Draize eye irritation (rabbits): non-irritating
Guinea pig sensitization: negative

CHRONIC EFFECTS AND CARCINOGENICITY
Carcinogenicity: OSHA: NO IARC: YES - 2B NTP: NO ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

This product may contain methyl tertiary butyl ether (MTBE): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API (www.api.org) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME:	Gasoline
DOT HAZARD CLASS and PACKING GROUP:	3, PG II
DOT IDENTIFICATION NUMBER:	UN 1203
DOT SHIPPING LABEL:	FLAMMABLE LIQUID

PLACARD:

15. REGULATORY INFORMATION

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION WT. PERCENT
Benzene (71-43-2)	0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline)
Ethyl benzene (100-41-4)	< 3

n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Toluene (108-88-3)	1 to 15
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 to 15

US EPA guidance documents (www.epa.gov/tri) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following deminimis levels of toxic chemicals subject to Section 313 reporting:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION - Parts per million (ppm) by weight
Polycyclic aromatic compounds (PACs)	17
Benzo (g,h,i) perylene (191-24-2)	2.55
Lead (7439-92-1)	0.079

CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

INGREDIENT NAME (CAS NUMBER)	Date Listed
Benzene	2/27/1987
Ethyl benzene	6/11/2004
Toluene	1/1/1991

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 2 (Flammable Liquid)
Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

16. OTHER INFORMATION

NFPA® HAZARD RATING	HEALTH:	1	Slight
	FIRE:	3	Serious
	REACTIVITY:	0	Minimal
HMIS® HAZARD RATING	HEALTH:	1 *	Slight
	FIRE:	3	Serious
	PHYSICAL:	0	Minimal
			* CHRONIC

SUPERSEDES MSDS DATED: 07/01/06

ABBREVIATIONS:

AP = Approximately	< = Less than	> = Greater than
N/A = Not Applicable	N/D = Not Determined	ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists	CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
AIHA	American Industrial Hygiene Association	DOT	U.S. Department of Transportation [General Info: (800)467-4922]
ANSI	American National Standards Institute (212)642-4900	EPA	U.S. Environmental Protection Agency
API	American Petroleum Institute (202)682-8000	HMIS	Hazardous Materials Information System

IARC	International Agency For Research On Cancer	REL	Recommended Exposure Limit (NIOSH)
MSHA	Mine Safety and Health Administration	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
NFPA	National Fire Protection Association (617)770-3000	SCBA	Self-Contained Breathing Apparatus
NIOSH	National Institute of Occupational Safety and Health	SPCC	Spill Prevention, Control, and Countermeasures
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)	STEL	Short-Term Exposure Limit (generally 15 minutes)
NTP	National Toxicology Program	TLV	Threshold Limit Value (ACGIH)
OPA	Oil Pollution Act of 1990	TSCA	Toxic Substances Control Act
OSHA	U.S. Occupational Safety & Health Administration	TWA	Time Weighted Average (8 hr.)
PEL	Permissible Exposure Limit (OSHA)	WEEL	Workplace Environmental Exposure Level (AIHA)
RCRA	Resource Conservation and Recovery Act	WHMIS	Workplace Hazardous Materials Information System (Canada)

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909
US GHS

Synonyms: Ultra Low Sulfur Diesel; Low Sulfur Diesel; No. 2 Diesel; Motor Vehicle Diesel Fuel; Non-Road Diesel Fuel; Locomotive/Marine Diesel Fuel

* * * Section 1 - Product and Company Identification * * *

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS
Emergency # 800-424-9300 CHEMTREC
www.hess.com (Environment, Health, Safety Internet Website)

* * * Section 2 - Hazards Identification * * *

GHS Classification:

Flammable Liquids - Category 3
Skin Corrosion/Irritation – Category 2
Germ Cell Mutagenicity – Category 2
Carcinogenicity - Category 2
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)
Aspiration Hazard – Category 1
Hazardous to the Aquatic Environment, Acute Hazard – Category 3

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

DANGER

Hazard Statements

Flammable liquid and vapor.
Causes skin irritation.
Suspected of causing genetic defects.
Suspected of causing cancer.
May cause respiratory irritation.
May cause drowsiness or dizziness.
May be fatal if swallowed and enters airways.
Harmful to aquatic life.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash hands and forearms thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing fume/mist/vapours/spray.

Response
In case of fire: Use water spray, fog or foam to extinguish.
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.
If swallowed: Immediately call a poison center or doctor. Do NOT induce vomiting.
IF exposed or concerned: Get medical advice/attention.

Storage
Store in a well-ventilated place. Keep cool.
Keep container tightly closed.
Store locked up.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
68476-34-6	Fuels, diesel, no. 2	100
91-20-3	Naphthalene	<0.1

A complex mixture of hydrocarbons with carbon numbers in the range C9 and higher.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

First Aid: Skin
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

First Aid: Ingestion
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, and other gaseous agents.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks."

Incompatibilities

Keep away from strong oxidizers.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Fuels, diesel, no. 2 (68476-34-6)

ACGIH: 100 mg/m3 TWA (inhalable fraction and vapor, as total hydrocarbons, listed under Diesel fuel)
Skin - potential significant contribution to overall exposure by the cutaneous route (listed under Diesel fuel)

Naphthalene (91-20-3)

ACGIH: 10 ppm TWA
15 ppm STEL
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 10 ppm TWA; 50 mg/m3 TWA
NIOSH: 10 ppm TWA; 50 mg/m3 TWA
15 ppm STEL; 75 mg/m3 STEL

Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Clear, straw-yellow.	**Odor:**	Mild, petroleum distillate odor
Physical State:	Liquid	**pH:**	ND
Vapor Pressure:	0.009 psia @ 70 °F (21 °C)	**Vapor Density:**	>1.0
Boiling Point:	320 to 690 °F (160 to 366 °C)	**Melting Point:**	ND
Solubility (H2O):	Negligible	**Specific Gravity:**	0.83-0.876 @ 60°F (16°C)
Evaporation Rate:	Slow; varies with conditions	**VOC:**	ND
Percent Volatile:	100%	**Octanol/H2O Coeff.:**	ND
Flash Point:	>125 °F (>52 °C) minimum	**Flash Point Method:**	PMCC
Upper Flammability Limit (UFL):	7.5	**Lower Flammability Limit (LFL):**	0.6
Burning Rate:	ND	**Auto Ignition:**	494°F (257°C)

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

Incompatible Products

Keep away from strong oxidizers.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Harmful if swallowed.

B: Component Analysis - LD50/LC50

Naphthalene (91-20-3)

Inhalation LC50 Rat >340 mg/m3 1 h; Oral LD50 Rat 490 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >20 g/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause mild irritation.

Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity

This material has been positive in a mutagenicity study.

Carcinogenicity

A: General Product Information

Suspected of causing cancer.

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

B: Component Carcinogenicity

Fuels, diesel, no. 2 (68476-34-6)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed under Diesel fuel)

Naphthalene (91-20-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)
IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))

Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any specific target organ general toxicity single exposure effects.

Specified Target Organ General Toxicity: Repeated Exposure

This product is not reported to have any specific target organ general toxicity repeat exposure effects.

Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Fuels, diesel, no. 2 (68476-34-6)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	35 mg/L [flow-through]	

Naphthalene (91-20-3)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	5.74-6.44 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	1.6 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	0.91-2.82 mg/L [static]	
96 Hr LC50 Pimephales promelas	1.99 mg/L [static]	

96 Hr LC50 Lepomis macrochirus	31.0265 mg/L [static]
72 Hr EC50 Skeletonema costatum	0.4 mg/L
48 Hr LC50 Daphnia magna	2.16 mg/L
48 Hr EC50 Daphnia magna	1.96 mg/L [Flow through]
48 Hr EC50 Daphnia magna	1.09 - 3.4 mg/L [Static]

Persistence/Degradability
No information available.

Bioaccumulation
No information available.

Mobility in Soil
No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions
See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging
Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 14 - Transportation Information * * *

DOT Information
Shipping Name: Diesel Fuel
NA #: 1993 **Hazard Class:** 3 **Packing Group:** III
Placard:

* * * Section 15 - Regulatory Information * * *

Regulatory Information

Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Naphthalene (91-20-3)

CERCLA: 100 lb final RQ; 45.4 kg final RQ

SARA Section 311/312 – Hazard Classes

Acute Health	Chronic Health	Fire	Sudden Release of Pressure	Reactive
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the de minimis levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right- To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

State Regulations

Component Analysis - State

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

Component	CAS	CA	MA	MN	NJ	PA	RI
Fuels, diesel, no. 2	68476-34-6	No	No	No	Yes	No	No
Naphthalene	91-20-3	Yes	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

Additional Regulatory Information

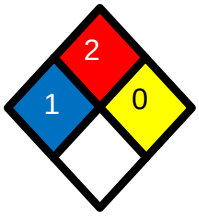
Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Fuels, diesel, no. 2	68476-34-6	Yes	DSL	EINECS
Naphthalene	91-20-3	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

NFPA® Hazard Rating

Health	1
Fire	2
Reactivity	0



HMIS® Hazard Rating

Health	1*	Slight
Fire	2	Moderate
Physical	0	Minimal
		*Chronic

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

Literature References

None

Other Information

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End of Sheet

MATERIAL SAFETY DATA SHEET
ENVIROGUARD ANTIFREEZE/COOLANT

HAZARD RATING

Health: 0 Flammability: 1 Reactivity: 0 * Personal Protection: 0

1. 1. GENERAL

Trade Name:	ENVIROGUARD
Chemical Family:	Glycol
Generic Name:	Proprylene Glycol (Proprylene Glycol with Dionized water when premixed)

DOT Hazmat proper

Shipping Name:	Not regulated
DOT Hazard Class:	Not regulated
CASE NO:	See Section 9 UN/NA ID NO. N/AP

2. 2. CAUTION

SUMMARY OF HAZARDS

Physical Hazards:	Slightly Combustible liquid
Acute Health Effects: (Short term)	Slight Eye irritant No inhalation hazard identified from data found No skin absorption hazard identified from data found No skin irritation identified from data found No ingestion hazard identified from data found All of above are conditioned for intended use of product

*Purchasers should review personal protection recommendations. Workplace conditions are an important factor in specifying adequate protection.

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2. 2. CAUTION (CONT'D)

SUMMARY OF HAZARDS

Chronic Health Effects: No chronic health effects are expected from normal use.

3. 3. FIRE AND EXPLOSION

Flash Point:	AP 211 degrees F
Autoignition Temp:	AP 700 degrees F
Flammable Limits - Atmospheric Temp & Pressure (% Volume in air)	Normal Lower AP – 2.4 Upper AP – 17.4
Fire and Explosion:	Heat from fire can generate flammable vapor when mixed with air and exposed to ignition source. Vapors can explode if confined. Vapors may travel long distances along ground before igniting/flashing back to vapor source. Fine sprays/mist may be combustible at temperatures below normal flash point. See supplement for hazards of aqueous solutions.
Extinguishing Media:	Dry chemical, CO2, Alcohol type foam.
Special Fire Fighting Procedures:	Do not enter fire area without proper protection. See "decomposition products possible" Fight fire from safe distance in a protected location. Heat may build pressure and rupture closed containers, spreading fire and increasing the risk of burns and injuries. Use water spray/fog for cooling. Avoid frothing/steam explosion. Burning liquid may float on water. Although soluble, may not be practical to extinguish fire by water dilution. Notify authorities if liquid enters sewer/public waters.

4. 4. HEALTH HAZARDS

Summary of Acute Hazards:

Slight Health hazard – See below for route-specific details.

ROUTE OF EXPOSURE	SIGNS AND SYMPTOMS
Inhalations	No significant signs or symptoms indicative of any adverse health hazard are expected to occur as a result of inhalation exposure.
Eye Contact	may cause minor eye irritation
Skin Absorption	No significant signs or symptom indicative of any adverse health hazard are expected to occur as a result of skin exposure.
Skin Irritation	No significant signs or symptoms indicative of any adverse health hazard are expected to occur as a result of skin exposure.
Ingestion	no significant signs or symptoms indicative of any adverse health hazard are expected to occur as a result of ingestion
Summary of chronic Hazards and special Health effects.	No chronic health effects are expected from normal use. This material or its emissions may aggravate pre-existing eye decease

5. 5. PROTECTIVE EQUIPTMENT AND OTHER CONTROL MEASURES

Respiratory:	NP special respiratory protection equipment is recommended under anticipated conditions of normal use with adequate ventilation.

PROTECTIVE EQUIPTMENT AND OTHER CONTROL MEASURES CONT'D

Eye:	Eye protection such as chemical splash goggles and/or face shield should be worn when the possibility exists for eye contact due to splashing or spraying liquid, airborne particles, or vapor. Contact lenses should not be worn.
Skin:	Not normally considered a skin hazard. When us results in skin contact wash hands and other exposed areas with mild soap and water before eating, drinking, smoking and when leaving work.
Engineering Controls:	No special ventilation is recommended under anticipated conditions of normal use beyond that needed for normal comfort control.
Other Hygiene And Work Practices	Use good personal hygiene practices. Wash hands before eating drinking, smoking or using toilet facilities. Promptly remove soiled clothing wash thoroughly before reuse. Shower after work using soap and water. No special work practices are needed beyond the above recommendations under anticipated conditions of normal use.

6. 6. OCCUPATIONAL EXPOSURE LIMIITS

No established standards

7. 7. EMERGENCY AND FIRST AID

Inhalation:	Not expected to present a significant inhalation hazard under anticipated conditions of normal use.
Eye Contact:	In case of eye contact immediately rinse with clear water for 20 to 30 minutes, retracting eyelids often. Obtain emergency medical attention if pain, blinking, tears or redness persists.
Skin Contact:	Not expected to present a significant skin hazard under anticipated conditions of normal use.
Ingestion:	Not expected to present a significant ingestion hazard under anticipated conditions of normal use.
Emergency Medical Treatment Procedures;	After adequate first aid, no further treatment is required unless symptoms reappear.

8. SPILL AND DISPOSAL

Precautions if Material is Spilled or Released	may contaminate water supplies/pollute public waters. Evacuate/limit access. Equipment responder with proper protection to prevent flow to sewers or public waters. Stop release. Notify environmental authorities. Restrict water use for cleanup – slippery walking conditions. Spread granular cover. Impound/recover large land spill, soak up small spill with inert solids. Use suitable disposal containers. On water material is soluble and may float or sink. May biodegrade. Contain/minimize dispersion. Disperse residue to reduce aquatic harm. Report per regulatory requirements.

SPILL AND DISPOSAL CONT'D

Waste Disposal Methods :	Landfill solids at permitted sites. Use registered transporters. Burn concentrated liquids, diluting with clean low viscosity fuel. Avoid flameouts assure emissions comply with applicable regulations. Dilute aqueous waste – may biodegrade. Avoid overloading/poisoning plant biomes. Assure effluent complies with applicable regulations. Soil or water should not be designated RCRA hazardous waste.

9. 9. COMPONENTS

COMPONENT NAME	CAS NO.	CARCINOGEN#	COMPOSITION WT.
Propylene Glycol	57-55-6	N/AP	99%

10. 10. LABEL INFORMATION

Manufacturer:	MARCUS PRODUCTS COMPANY
Use Statement:	For industrial use only. Keep out of reach of children
Signal Word:	Caution
Physical Hazards: Health Hazards:	Combustible Eye irritant
Precautionary Measures:	Do not handle near heat, sparks or open flame Avoid contact with eyes
DOT Information; Hazard Class: Proper Shipping:	UN/NA ID# - N/AP Not regulated Not regulated
In case of Fire:	Use dry chemical, Co2, Alcohol type foam

First Aid:

Inhalation:	Not expected to present a significant inhalation hazard under anticipated conditions of normal use.
Eye Contact:	In case of eye contact, immediately rinse with clear water for 20 to 30 minutes, retracting eyelids often. Obtain emergency medical attention if pain, blinking, tears or redness persists.
Skin Contact:	Not expected to present a significant skin hazard under anticipated conditions of normal use
Ingestion:	Not expected to present a significant ingestion hazard under anticipated conditions of normal use

Protective Equipment:

Respiratory:	No special respiratory protection normally required when used with adequate ventilation
Eye;	Chemical splash goggles and/or face shield
Skin:	No special clothing normally required. When use results in skin contact, wash thoroughly before eating, drinking, smoking or leaving work

11. SUPPLEMENT

Regulatory Information:

SARA TITLE III

Section 311/312 Hazard Categories: None Apply

Section 313: No chemical in this product exceed the de minimus reporting level established by SARA 313 and 40 CFR 372.

Supplement to Sections II and IV Health Hazards

Acute Health Effects: One literature report indicates rare eczematous skin reactions and even more rarely an allergic skin reaction from exposure to propylene glycol. (Anderson and Starr, Hautzart 33 (1): 1982

Supplement to Sections I and III Fire and Explosion Hazards

Flammability of aqueous solutions of propylene glycol greater than 22% by weight. If heated sufficiently, will produce flammable vapors. Only aqueous solutions of propylene glycol less than 22% should be used in sprinkler systems or other fire-fighting equipment. Always drain and flush systems containing propylene glycol with water before welding or other maintenance.

National Paint and Coatings Associations Hazardous material ID System:

	Health	0
	Flammability	1
	Reactivity	0
*	Personal Protection	0

- Purchasers should review personal protection recommendations. Workplace conditions are an important factor in specifying adequate protection.

Safety Data Sheet

Material Name: Jet Fuel A and A1 **SDS No. 0325**
US GHS

Synonyms: Aviation Kerosene; Aviation Turbine Fuel Jet A; Jet A; Jet A –1; JP – 1; Military Aviation Jet Fuel JP –1

* * * Section 1 - Product and Company Identification * * *

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS
Emergency # 800-424-9300 CHEMTREC
www.hess.com (Environment, Health, Safety Internet Website)

* * * Section 2 - Hazards Identification * * *

GHS Classification:

Flammable Liquids - Category 3
Skin Corrosion/Irritation - Category 2
Eye Damage/Irritation - Category 2A
Carcinogenicity – Category 1B
Specific Target Organ Systemic Toxicity (STOT) - Single Exposure Category 3
Aspiration Hazard - Category 1
Hazardous to the Aquatic Environment Chronic - Category 2

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

Danger

Hazard Statements

Flammable liquid and vapor.
Causes skin irritation.
Causes serious eye irritation.
May cause cancer.
May cause respiratory irritation.
May cause drowsiness or dizziness.
May be fatal if swallowed and enters airways.
Toxic to aquatic life with long lasting effects.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.

Response
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.
IF SWALLOWED: Immediately call a poison center or doctor/physician. Do NOT induce vomiting.
If exposed or concerned: Get medical advice/attention.
In case of fire: Use water spray, fog or fire fighting foam to extinguish.

Storage
Store locked up.
Store in a well-ventilated place. Keep cool.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
8008-20-6	Kerosene	100
91-20-3	Naphthalene	2

A complex combination of hydrocarbons including naphthenes, paraffins, and aromatics.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

First Aid: Skin
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

First Aid: Ingestion

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, and other gaseous agents.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks."

Incompatibilities

Keep away from strong oxidizers.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Kerosene (8008-20-6)

ACGIH: 200 mg/m3 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/m3 TWA

Naphthalene (91-20-3)

ACGIH: 10 ppm TWA
15 ppm STEL
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 10 ppm TWA; 50 mg/m3 TWA
NIOSH: 10 ppm TWA; 50 mg/m3 TWA
15 ppm STEL; 75 mg/m3 STEL

Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Personal Protective Equipment: Respiratory

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Pale yellow to water-white.	**Odor:**	Characteristic petroleum distillate odor
Physical State:	Liquid	**pH:**	ND
Vapor Pressure:	0.029 psia @ 100 °F (38 °C)	**Vapor Density:**	AP 4.5
Boiling Point:	280 to 572 °F (140 to 300 °C)	**Melting Point:**	ND
Solubility (H2O):	Negligible	**Specific Gravity:**	0.75-0.80
Evaporation Rate:	Slow; varies with conditions	**VOC:**	ND
Percent Volatile:	100%	**Octanol/H2O Coeff.:**	ND
Flash Point:	>100 °F (38 °C)	**Flash Point Method:**	TCC
Upper Flammability Limit (UFL):	5.0	**Lower Flammability Limit (LFL):**	0.7
Burning Rate:	ND	**Auto Ignition:**	410°F (210°C)

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

Incompatible Products

Keep away from strong oxidizers such as nitric and sulfuric acids.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Harmful if swallowed.

B: Component Analysis - LD50/LC50

Kerosene (8008-20-6)

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

Naphthalene (91-20-3)

Inhalation LC50 Rat >340 mg/m3 1 h; Oral LD50 Rat 490 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >20 g/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause mild to moderate irritation.

Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity

This product is not reported to have any mutagenic effects.

Carcinogenicity

A: General Product Information

Dermal carcinogenicity: positive - mice
Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of this finding to human exposure has not been determined.

B: Component Carcinogenicity

Kerosene (8008-20-6)

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

Naphthalene (91-20-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)
IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))

Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any specific target organ general toxicity single exposure effects.

Specified Target Organ General Toxicity: Repeated Exposure

This product is not reported to have any specific target organ general toxicity repeat exposure effects.

Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Harmful to aquatic life with long lasting effects. Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Naphthalene (91-20-3)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	5.74-6.44 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	1.6 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	0.91-2.82 mg/L [static]
96 Hr LC50 Pimephales promelas	1.99 mg/L [static]
96 Hr LC50 Lepomis macrochirus	31.0265 mg/L [static]
72 Hr EC50 Skeletonema costatum	0.4 mg/L
48 Hr LC50 Daphnia magna	2.16 mg/L
48 Hr EC50 Daphnia magna	1.96 mg/L [Flow through]
48 Hr EC50 Daphnia magna	1.09 - 3.4 mg/L [Static]

Persistence/Degradability

No information available.

Bioaccumulation

No information available.

Mobility in Soil

No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 14 - Transportation Information * * *

DOT Information

Shipping Name: Fuel, Aviation, Turbine Engine

UN #: 1863 **Hazard Class:** 3 **Packing Group:** III

Placard:

* * * Section 15 - Regulatory Information * * *

Regulatory Information

Component Analysis – Inventory

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Naphthalene (91-20-3)

CERCLA: 100 lb final RQ; 45.4 kg final RQ

SARA Section 311/312 – Hazard Classes

Acute Health	Chronic Health	Fire	Sudden Release of Pressure	Reactive
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the de minimis levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right- To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

State Regulations

Component Analysis - State

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

Component	CAS	CA	MA	MN	NJ	PA	RI
Kerosene	8008-20-6	No	Yes	No	Yes	Yes	No
Naphthalene	91-20-3	Yes	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

Additional Regulatory Information

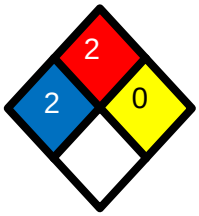
Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Kerosene	8008-20-6	Yes	DSL	EINECS
Naphthalene	91-20-3	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

NFPA® Hazard Rating

Health	2
Fire	2
Reactivity	0



HMIS® Hazard Rating

Health	2*	Moderate
Fire	2	Moderate
Physical	0	Minimal
		*Chronic

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

Literature References

None

Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet

Safety Data Sheet

Material Name: Jet Fuel JP-4

SDS No. 9947
US GHS

Synonyms: JP –4 Jet Fuel

* * * Section 1 - Product and Company Identification * * *

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS
Emergency # 800-424-9300 CHEMTREC
www.hess.com (Environment, Health, Safety Internet Website)

* * * Section 2 - Hazards Identification * * *

GHS Classification:

Flammable Liquid - Category 2
Germ Cell Mutagenicity - Category 1B
Carcinogenicity - Category 1A
Specific Target Organ Systemic Toxicity (STOT) – Single Exposure Category 3
Specific Target Organ Systemic Toxicity (STOT) - Repeat Exposure Category 2
Aspiration Hazard - Category 1
Hazardous to the Aquatic Environment Acute - Category 3
Hazardous to the Aquatic Environment Chronic - Category 3

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

Danger

Hazard Statements

Highly flammable liquid and vapour.
May cause genetic defects.
May cause cancer.
May cause drowsiness or dizziness.
May cause damage to organs (liver, kidneys, blood, central nervous system, skin) through prolonged or repeated exposure.
May be fatal if swallowed and enters airways.
Harmful to aquatic life with long lasting effects.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wash thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe fume/gas/mist/vapours/spray.
Wear protective gloves/protective clothing/eye protection/face protection.
Avoid release to the environment.

Response

IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs, get medical advice/attention. Wash contaminated clothing before reuse.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.
IF exposed or concerned: Get medical advice/attention.
In case of fire: Use water spray, fog or fire fighting foam.

Storage

Store in a well-ventilated place. Keep cool. Keep container tightly closed.
Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
8008-20-6	Kerosene	35-65
64742-73-0	Naphtha, petroleum, hydrodesulfurized light	35-65
71-43-2	Benzene	0.1-0.4

A complex combination of hydrocarbons including naphthenes, paraffins, and aromatics.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

First Aid: Skin

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops.

First Aid: Ingestion

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, and other gaseous agents.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers.

Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Handle as a combustible liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

Incompatibilities

Strong oxidizers.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Kerosene (8008-20-6)

ACGIH: 200 mg/m3 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/m3 TWA

Benzene (71-43-2)

ACGIH: 0.5 ppm TWA
2.5 ppm STEL
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
50 ppm Peak (10 minutes)
25 ppm Ceiling
5 ppm STEL (see 29 CFR 1910.1028)
10 ppm TWA (applies to industry segments exempt from the benzene standard at 29 CFR 1910.1028); 1 ppm TWA
NIOSH: 0.1 ppm TWA
1 ppm STEL

Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Personal Protective Equipment: Respiratory

A NIOSH approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

Personal Protective Equipment: Hands

Gloves constructed of nitrile or neoprene are recommended.

Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Pale yellow to water-white	**Odor:**	Characteristic petroleum distillate odor
Physical State:	Liquid	**pH:**	ND
Vapor Pressure:	2-3 psia @ 100 °F (38 °C)	**Vapor Density:**	AP 4.5
Boiling Point:	135-518 °F (57-270°C)	**Melting Point:**	ND
Solubility (H2O):	Negligible	**Specific Gravity:**	0.75-0.80
Evaporation Rate:	ND	**VOC:**	ND
Percent Volatile:	100%	**Octanol/H2O Coeff.:**	ND
Flash Point:	-10 to 30 °F (-23 to -1 °C)	**Flash Point Method:**	PMCC
Upper Flammability Limit (UFL):	8.0	**Lower Flammability Limit (LFL):**	1.3
Burning Rate:	ND	**Auto Ignition:**	464°F (240°C)

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

Incompatible Products

Keep away from strong oxidizers such as nitric and sulfuric acids.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Harmful or fatal if swallowed.

B: Component Analysis - LD50/LC50

Naphtha, petroleum, hydrodesulfurized light (64742-73-0)

Oral LD50 Rat >5000 mg/kg; Dermal LD50 Rabbit >3160 mg/kg

Kerosene (8008-20-6)

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

Benzene (71-43-2)

Inhalation LC50 Rat 13050-14380 ppm 4 h; Oral LD50 Rat 1800 mg/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact may cause mild irritation.

Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity

May cause genetic defects.

Carcinogenicity

A: General Product Information

May cause cancer.

Studies have shown that similar products produce skin cancer or skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

B: Component Carcinogenicity

Kerosene (8008-20-6)

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

Benzene (71-43-2)

ACGIH: A1 - Confirmed Human Carcinogen
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
NIOSH: potential occupational carcinogen
NTP: Known Human Carcinogen (Select Carcinogen)
IARC: Monograph 100F [in preparation]; Supplement 7 [1987]; Monograph 29 [1982] (Group 1 (carcinogenic to humans))

Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure

May cause drowsiness or dizziness.

Specified Target Organ General Toxicity: Repeated Exposure

This product may cause damage to organs through prolonged or repeated exposure (liver, kidneys, blood, central nervous system, skin).

Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Harmful to aquatic life with long lasting effects. Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Naphtha, petroleum, hydrodesulfurized light (64742-73-0)

Test & Species		Conditions
96 Hr LC50 Chaetogammarus marinus	2.6 mg/L	

Benzene (71-43-2)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	10.7-14.7 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	5.3 mg/L [flow-through]	
96 Hr LC50 Lepomis macrochirus	22.49 mg/L [static]	
96 Hr LC50 Poecilia reticulata	28.6 mg/L [static]	
96 Hr LC50 Pimephales promelas	22330-41160 µg/L [static]	
96 Hr LC50 Lepomis macrochirus	70000-142000 µg/L [static]	
72 Hr EC50 Pseudokirchneriella subcapitata	29 mg/L	
48 Hr EC50 Daphnia magna	8.76 - 15.6 mg/L [Static]	
48 Hr EC50 Daphnia magna	10 mg/L	

Persistence/Degradability

No information available.

Bioaccumulation

No information available.

Mobility in Soil

No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 14 - Transportation Information * * *

DOT Information

Shipping Name: Fuel, Aviation, Turbine Engine
UN #: 1863 **Hazard Class:** 3 **Packing Group:** II
Placard:

* * * Section 15 - Regulatory Information * * *

Regulatory Information

Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Benzene (71-43-2)

SARA 313: 0.1 % de minimis concentration
CERCLA: 10 lb final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule); 4.54 kg final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule)

SARA Section 311/312 – Hazard Classes

Acute Health	Chronic Health	Fire	Sudden Release of Pressure	Reactive
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION PERCENT BY WEIGHT
Benzene (71-43-2)	0.01 to 0.4

State Regulations

Component Analysis - State

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

Component	CAS	CA	MA	MN	NJ	PA	RI
Kerosene	8008-20-6	No	Yes	No	Yes	Yes	No
Benzene	71-43-2	Yes	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.
WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Benzene	71-43-2	0.1 %

Additional Regulatory Information

Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Naphtha, petroleum, hydrodesulfurized light	64742-73-0	Yes	DSL	EINECS
Kerosene	8008-20-6	Yes	DSL	EINECS
Benzene	71-43-2	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

NFPA® Hazard Rating

Health	2
Fire	2
Reactivity	0

HMIS® Hazard Rating

Health	2	Moderate
Fire	2	Moderate
Physical	0	Minimal
		*Chronic

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

Literature References

None

Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet

MATERIAL SAFETY DATA SHEET

SECTION 1 – PRODUCT INFORMATION

Product Name: Propane

Trade Name: LPG (Liquefied Petroleum Gas), LP-Gas

Chemical Formula: C_3H_8

WHMIS Classification: Class A – Compressed Gas
Class B, Division 1 – Flammable G

Supplier: Superior Propane
A Division of Superior Plus LP
1111 - 49th Avenue N.E.
Calgary, AB T2E 8V2
Business: (403) 730-7500

24-Hour Emergency Contact: Canutec (613) 996-6666

Application and Use: Propane is commonly used as a fuel for heating, cooking, automobiles, forklift trucks, crop drying and welding and cutting operations. Propane is used in industry as a refrigerant, solvent and as a chemical feedstock.

SECTION 2 – HAZARDOUS INGREDIENTS

COMPONENTS	CAS No	% VOLUME (v/v)	LD_{50} (RAT, ORAL)
Propane	74-98-6	90% -99%	Not Applicable
Propylene	115-07-1	0% - 5%	Not Applicable
Ethane	74-84-0	0% - 5%	Not Applicable
Butane and heavier hydro carbons	106-97-8	0% - 2.5%	Not Applicable

Occupational Exposure Limit:
Based upon animal test data, the acute toxicity of this product is expected to be inhalation: 4 hour LC50 = 280,000 ppm (Rat)

Note: Composition is typical for HD-5 Propane per The Canadian General Standard Board CGSB 3.14 National Standard of Canada. Exact composition will vary from shipment to shipment.

SECTION 3 – CHEMICAL AND PHYSICAL DATA

Form: Liquid and vapour while stored under pressure

Boiling Point: -42°C @ 1 atm

Freezing Point: -188°C

Evaporation Rate: Rapid (Gas at normal ambient conditions)

Vapour Pressure: 1435 kPa (maximum) @ 37.8°C

Vapour Density: 1.52 (Air = 1)

Coefficient of Water/Oil Distribution: Not available

pH: Not available

Solubility in Water: Slight, 6.1% by volume @ 17.8°C

Specific Gravity: 0.51 (water = 1)

Appearance/Odour: Colourless liquid and vapour while stored under pressure. Colourless and odourless gas in natural state at any concentration. Commercial propane has an odourant added, ethyl mercaptan, which has an odour similar to boiling cabbage.

Odour Threshold: 4800 ppm

With proper handling, transportation and storage, adding a chemical odourant such as ethyl mercaptan has proven to be a very effective warning device, but all odourants have certain limitations. The effectiveness of the odourant may be diminished by a person's sense of smell, by competing odours and by oxidation which may cause a potentially dangerous situation.

SECTION 4 – FIRE OR EXPLOSION HAZARD

Flash Point: -103.4°C

Method: Closed cup

Flammable Limits: Lower 2.4%, Upper 9.5%

Auto Ignition Temperature: 432 °C

Hazardous Combustion Products: Carbon monoxide can be produced when primary air and secondary air aredeficient while combustion is taking place.

Fire and Explosive Hazards: Explosive air - vapour allowed to leak to atmosphere.

Sensitivity to Impact: No

Sensitivity to Static Discharge: Yes

Fire Extinguishing Precautions: Use water spray to cool exposed cylinders or tanks. Do not extinguish fire unless the source of the escaping gas that is fueling the fire can be turned off.
Fire can be extinguished with carbon dioxide and/or dry chemical (BC). Container metal shells require cooling with water to prevent impingement and the weakening of metal.
If sufficient water is not available to protect the container shell from weakening, the area will be required to be evacuated.
If gas has not ignited, liquid or vapour may be dispersed by water spray or flooding.

Special Fire Fighting Equipment: Protective clothing, hose monitors, fog nozzles, self-contained breathing apparatus material, drains and openings to building

SECTION 5 – REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Keep separate from oxidizing agents.
Gas explodes spontaneously when mixed with chloride dioxide.
Incompatibility: Remove sources of ignition and observe distance requirements for storage tanks from combustible

Hazardous Decomposition Products: Deficient primary and secondary air can produce carbon monoxide.

Hazardous Polymerization: Will not occur.

SECTION 6 – TOXICOLOGICAL PROPERTIES OF MATERIAL

Routes of Entry: Skin Contact, Eye Contact, Inhalation

Inhalation: Simple asphyxiant. No effect at concentrations of 10,000 ppm (peak exposures). Higher concentrations may cause central nervous system disorder and/or damage. Lack of oxygen may cause dizziness, loss of coordination, weakness, fatigue, euphoria, mental confusion, blurred vision, convulsions, breathing failure, coma and death. Breathing high vapour concentrations (saturated vapours) for a few minutes may be fatal. Saturated vapours may be encountered in confined spaces and/or under conditions of poor ventilation. Avoid breathing vapours or mist.

Skin and Eye Contact: Exposure to vapourizing liquid may cause frostbite (cold burns) and permanent eye damage.

Ingestion: Not considered to be a hazard.

Acute Exposure: Contact with Liquefied Petroleum Gas may cause frostbite or cold burns. Propane acts as a simple asphyxiant as oxygen content in air is displaced by the propane. At increasing concentration levels, propane may cause dizziness, headaches, loss of coordination, fatigue, unconsciousness and death.

Chronic Exposure: No reported effects from long term low level exposure.

Sensitization to Product: Not known to be a sensitizer.

Occupational Exposure Limits: American Conference of Governmental Industrial Hygienists (ACGIH) lists as a simple asphyxiant.

ACGIH TLV: 1000 ppm

Carcinogenicity, Reproductive Toxicity, Teratogenicity, Mutagenicity: No effects reported.

Other Toxicological Effects: None

SECTION 7 – PREVENTATIVE MEASURES

Eyes:	Safety glasses or chemical goggles are recommended when transferring product.
Skin:	Insulated gloves required if contact with liquid or liquid cooled equipment is expected. Wear gloves and long sleeves when transferring product.
Inhalation:	Where concentration in air would reduce the oxygen level below 18% air or exceed occupational exposure limits in section 6, self-contained breathing apparatus is required.
Ventilation:	Use in well-ventilated areas. Use with explosion proof mechanical ventilation in confined spaces or poorly ventilated areas.

SECTION 8 – EMERGENCY AND FIRST AID PROCEDURES

Eyes:	Should eye contact with liquid occur, flush eyes with lukewarm water for 15 minutes. Obtain immediate medical care.
Skin:	In case of "Cold Burn" from contact with liquid, immediately place affected area in lukewarm water and keep at this temperature until circulation returns. If fingers or hands are frostbitten, have the victim hold his hand next to his body such as under the armpit. Obtain immediate medical care.
Ingestion:	None considered necessary.
Inhalation:	Remove person to fresh air. If breathing is difficult or has stopped, administer artificial respiration. Obtain immediate medical care.
Spill or Leak:	Eliminate leak if possible. Eliminate source of ignition. Ensure cylinder is upright. Disperse vapours with hose streams using fog nozzles. Monitor low areas as propane is heavier than air and can settle into low areas. Remain upwind of leak. Keep people away. Prevent vapour and/or liquid from entering into sewers, basements or confined areas.

SECTION 9 – TRANSPORTATION, HANDLING AND STORAGE

- Transport and store cylinders and tanks secured in an upright position in a ventilated space away from ignition sources (so the pressure relief valve is in contact with the vapour space of the cylinder or tank).
- Cylinders that are not in use must have the valves in the closed position and be equipped with a protective cap or guard.
- Do not store with oxidizing agents, oxygen, or chlorine cylinders.
- Empty cylinders and tanks may contain product residue. Do not pressurize, cut, heat or weld empty containers.
- Transport, handle and store according to applicable federal and provincial codes and regulations.

Transportation of Dangerous Goods (TDG)
TDG Classification: Flammable Gas 2.1

TDG Shipping Name: Liquefied Petroleum Gas (Propane)

PIN Number: UN1075

SECTION 10 – PREPARATION INFORMATION

Prepared by: Superior Propane
Health Safety and Environment Team

Telephone: (403) 730-7500
Revision: January 17, 2014
Supersedes: January 17, 2011

Appendix E

Forms

ACCIDENT/NEAR MISS REPORT
(Page 1 of 2)

Incident Date: _____ Time: _____

Location:
_____

_____

Name and Position of Person Making Report
_____

Name of individual(s) involved:
_____

_____

Driver's License No.(s) if required _____

Individual or Company _____ Phone No. _____

Did the Incident Result in Personal Injury? Yes _____ No _____

Injury report attached Yes _____ No _____
(i.e. Worker's Safety and Compensation Commission form or other applicable form)

Did the incident cause damage to Landfill or other property? Yes _____ No _____

Who investigated the Incident?

Supervisor _____ RCMP _____ Special Committee _____ HS&S _____

Contact Person(s) _____

Details of Equipment/Property Damage if Applicable

Damage was to: Vehicle Equipment Property

Description:

Unit No. Year Make Model

_____

_____

_____

Estimated Value of Vehicle/Equipment/Property _____

Estimated Damage to Vehicle/Equipment/Property _____

ACCIDENT/NEAR MISS REPORT
(Page 2 of 2)

Description of Incident (use attachment if necessary)

Incident Cause (use attachment if necessary)

Sketch of Incident Where Applicable (use attachment if necessary)

Recommendation to Prevent Re-occurrence (use attachment if necessary)

Comments (use attachment if necessary)

Name: _____ Signature: _____

Report Date _____

Distribution List:

Hamlet of Tuktoyaktuk
Tuktoyaktuk Municipal Solid Waste Facility

OPERATIONS LOG

DATE: Day _____ Month _____ Year _____		
WEATHER: Precipitation _____ mm Temp. _____ °C Wind : _____ km from _____		
DAILY WASTE RECORD:		
Received (in-bound)	_____ m^3	Estimated Volume Reduction by Compaction _____m^3
Recycled (out-bound)	_____ m^3	
Compost Materials	_____ m^3	
Clean Wood Materials	_____ m^3	
STAFF:		
Landfill Operator	Start: _____	Leave: _____
EQUIPMENT:		
Compactor	Hours: _____	Activity: _____
	Hours: _____	Activity: _____
SITE MAINTENANCE: (i.e. litter, fences, roads, other)	Activities _____	Comments _____
SITE INSPECTIONS:	Observations	Action Taken or Required
Litter	_____	_____
Surface Water	_____	_____
Intermediate Cover	_____	_____
Final Cover	_____	_____
Compaction	_____	_____
MONITORING:		
SITE MAINTENANCE:	_____	
OTHER:	_____ (Use back of form to note other activities.)	

HAZARD ASSESSMENT CHECKLIST

(Page 1 of 4)

Step 1: Fire Hazard Assessment Checklist		
Facility: _____		Date: _____, ____
Priority for Corrective Action	#1 high risk #2 moderate risk #3 low risk #4 no risk #5 not applicable	

Item	Identified Hazard	Status (Priority)	Safety Hazard and Location
Fire Safety			
1	Employee training		
2	Employee knowledge		
3	On-site communications		
4	Off-site communications		
5	Water supply		
6	Site security		
7	Fire safety plan		
8	Fire drills		
Storage of Materials			
1	Compressed Gases		
2	Aerosols		
3	Dangerous goods		
4	30 m clearance of stored materials from brush or forest		
5	6 m clearance of stored materials from uncontrolled grass or weeds		
6	Fire Dept. access		
7	Fencing/Security		
8	Access to water		
9	Lumber storage		
10	Wood chips, hogged materials.		
11	Used Tire Storage		
12	Fire Department Access		
13	Fire breaks		

HAZARD ASSESSMENT CHECKLIST

(Page 2 of 4)

Step 2: Fire Safety Hazard Assessment Corrective Action				
Facility:			Date	
Assessment Team			Persons	Position
Item	**Priority**	**Recommended Action**	**Follow-up** **Action taken Date/Time**	**By whom?**
Municipal Systems Manager Signature:			Date:	

HAZARD ASSESSMENT CHECKLIST

(Page 3 of 4)

Step #3	**Health and Safety Hazard Assessment Checklist**		
Facility		Date/Time:	
Priority Status	#1 very hazardous, previous accident of high potential #2 hazardous with moderate risk #3 low risk #4 O.K. #5 not applicable (N/A)		
Item #	**Identified Hazards**	**Status/Priority**	**Safety Hazard and Location**
1	Housekeeping		
2	Material Storage		
3	Waste disposal		
4	Lighting		
5	Ventilation		
6	Extreme Temperature		
7	Radiation exposure		
8	Gas (toxic or non-life supporting)		
9	Flammables (Fire/Explosion)		
10	Dangerous Pressure		
11	Chemicals		
12	Hazardous Materials (WHMIS)		
13	High Risk Positioning		
14	Electrical Hazards		
15	Overhead Hazards		
16	Underground Hazards		
17	Confined Space Entry		
18	Excavations		
19	Restricted Access/Egress		
20	Ladders		
21	Work at Heights		

HAZARD ASSESSMENT CHECKLIST

(Page 4 of 4)

Step #3	**Health and Safety Hazard Assessment Checklist**		
Facility		Date/Time:	
Priority Status	#1 very hazardous, previous accident of high potential #2 hazardous with moderate risk #3 low risk #4 O.K. #5 not applicable (N/A)		
Item #	**Identified Hazards**	**Status/Priority**	**Safety Hazard and Location**
23	Work over water		
24	Major lifts (hoisting)		
25	Vehicles		
26	Mobile equipment		
27	High traffic		
28	Power tools		
29	Permits		
30	Communications		
31	First Aid		
32	Personal Protection Equipment		
33	Other items		
Municipal Systems Manager Signature:			Date:

Hamlet of Tuktoyaktuk
Tuktoyaktuk Municipal Solid Waste Facility

MONTHLY SITE OPERATIONS INSPECTION
(Page 1 of 3)

Date: _____ **Inspector:** _____

A: Acceptable, U: Unacceptable

No	Item	A	U	Comments
1.0	**PERMITS AND APPROVALS**			
1.1	Municipal Development Permit			
1.2	Land Titles, Lease Agreements			
1.3	NWT Water Board Approvals			
1.4	Other			
2.0	**RECORDS**			
2.1	Survey and Site Plans			
2.2	Waste Volumes			
2.3	Special Waste Records			
2.4	Operating Logs			
2.5	Monitoring Reports			
3.0	**PERSONNEL TRAINING AND CERTIFICATION**			
3.1	MSM			
3.2	First Aid			
3.3	Work Place Safety (OH&S)			
3.4	WHMIS			
3.5	Other			
4.0	**DESIGN AND OPERATION AND MAINTENANCE PLAN**			
4.1	Site Development Plan current			
4.2	Operations Procedures & Policies Current			
4.3	Construction/As-built records			
5.0	**PERSONNEL, OPERATING EQUIPMENT AND FACILITIES**			
5.1	MSM			
5.2	Support Personnel			
5.3	Staff Facilities			
5.4	Equipment Facilities			
5.5	Communication equipment			

MONTHLY SITE OPERATIONS INSPECTION
(Page 2 of 3)

No	Item	A	U	Comments
6.0	**ENTRANCE AND ROADWAYS**			
6.1	Site Appearance			
6.2	Entrance Road			
6.3	On-site Access Roads			
6.4	Road Surfacing			
7.0	**SITE DEVELOPMENT**			
7.1	Cell Construction			
7.2	Cell Containment (leachate leaking through berms)			
7.3	Aggregate Stockpiles			
8.0	**ACTIVE WORKING AREA**			
8.1	Vehicle Staging/Safety			
8.2	Working Area			
8.3	Waste Compaction Density			
8.4	Cover Frequency			
8.5	Surface Water Controls			
8.6	Litter Controls			
8.7	Other			
9.0	**INACTIVE SLOPES**			
9.1	Intermediate Cover (300 mm)			
9.2	Drainage and Grading			
9.3	Erosion Controls			
10.0	**COMPLETED AREAS**			
10.1	1000 mm aggregate layer			
11.0	**SURFACE WATER MANAGEMENT**			
11.1	Working area controls			

MONTHLY SITE OPERATIONS INSPECTION
(Page 3 of 3)

No	Item	A	U	Comments
12.0	**ENVIRONMENTAL MONITORING AND CONTROLS**			
12.1	Annual IWB Report on file			
12.2	Litter Management			
12.3	Animal Management			
12.4	Dust Management			
13.0	**RECYCLING FACILITIES**			
13.1	Tires			
13.2	Metals			
13.3	Appliances			
13.4	Batteries			
13.5	Plastics			
14.0	**SAFETY**			
14.1	Employee Safety Practices/Issues			
14.2	Customer Safety Practices/Issues			
14.3	Equipment Backup Alarms			
14.4	Documentation			
15.0	**EMERGENCY RESPONSE**			
15.1	Medical Emergency Response			
15.2	Fire Response			
15.3	Environmental Response			