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# WASTE MANAGEMENT PLAN ANGILAK PROPERTY KIVALLIQ ENERGY CORPORATION

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## 1. Introduction

This Waste Management Plan (WMP) shall be in effect from March 1, 2018 and has been specifically prepared for the Angilak Property. The Angilak Property is located 225 kilometres south-southwest of Baker Lake and 350 kilometres west of Rankin Inlet in the Kivalliq Region of Nunavut. Kivalliq Energy Corporation's Nunavut Waste Generator Number is NUG 10036.

The purpose of this Waste Management Plan is to provide procedures for the collection, storage, transportation and disposal of wastes while minimizing adverse effects on the environment. A copy of this plan will be kept in the office at site and at the head office in Vancouver. Copies of this plan may be obtained from Kivalliq Energy Corporation.

This Waste Management Plan should be used in conjunction with other property plans and best management practices. Other plans at the Angilak Property include:

- Abandonment and Restoration Plan
- Emergency Response Plan
- Environmental and Wildlife Management Plan
- Field Safety Manual
- Fuel Management Plan
- Spill Contingency Plan
- Radiation Hazard Control Plan

### 1.1. Corporate Details

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### 1.2. Project Description

The Angilak Property consists of 91 active mineral claims and Inuit Owned Land Parcel RI-30 (IOL), comprising a total area of 89,852 hectares in the Kivalliq region of southern Nunavut Territory. The Property is located 350 kilometres west of Rankin Inlet and 225 kilometres southwest of Baker Lake. The property dimensions measure 55 kilometres east-west by 35 kilometres north-south.

All mineral claims and the IOL are contiguous and extend north, south, east and west between 6925000m N and 6965000m N and 479300m E to 533000m E, NAD83, Zone 14, NTS Map sheets 65 J/06, 65 J/07, 65 J/09, 65 J/10, 65 J/11 and 65 J/15 (latitudes 62° 27' North and 62°48' North and longitudes 98° 21' West and 99°24' West).

The work proposed for the 2018 exploration program consists of low-impact activities including: prospecting, geological mapping, rock and soil/till sampling.

### **1.3. Applicable Legislation and Guidelines**

Waste management at the Angilak Property will be conducted in accordance with Federal and Territorial Acts, Regulations, Guidelines and Recommendations including, but not limited to:

#### **1.3.1. Federal**

- CCME Environmental Codes of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products
- Canada-Wide Standards for Dioxins and Furans (Canadian Council of Ministers of the Environment)
- Canadian Centre for Occupational Health and Safety Act
- Canadian Environmental Protection Act
- Fisheries Act
- Guidelines for Spill Contingency Planning (INAC)
- International Air Transport Association (IATA) Regulations
- National Fire Code of Canada
- Northern Land Use Guidelines
- Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations
- Territorial Lands Act
- Transportation of Dangerous Goods Act
- Workplace Hazardous Materials Information System (WHMIS)

#### **1.3.2. Territorial**

- Environmental Guideline for the Management of Contaminated Sites
- Environmental Guideline for the General Management of Hazardous Waste
- Environmental Protection Act
- Nunavut Environmental Guidelines for the Burning and Incineration of Solid Wastes
- Municipal Solid Wastes Suitable for Open Burning Guidelines
- Fire Prevention Act
- Mine Health and Safety Act and Regulations
- Nunavut Occupational Health and Safety Regulations
- Nunavut Waters Act and Nunavut Surface Rights Tribunal Act
- Public Health Act
- Safety Act

## 2. Waste Management

### 2.1. Definition of Wastes

At the Angilak Property, waste is a term used to describe materials that are no longer wanted or are unusable for their original intended purpose. Hazardous waste is defined as “a contaminant which is a dangerous good that is no longer used for its original purpose and is intended for recycling, treatment, disposal or storage” (Guideline for the General Management of Hazardous Waste, 2010). Hazardous wastes often require specific management measures to ensure the health and safety of the workers and environment.

### 2.2. Waste Sources

A summary of the predicted types of wastes (hazardous and non-hazardous) to be generated on the Angilak Property from exploration activities and camp operations is provided in the tables below.

**Table 1: Non-Hazardous (Inert) Wastes**

Waste Type	Examples	Estimated Quantity Generated
Sludges	Drill cutting fines	0.53m <sup>3</sup> /day
Hazardous	Radioactive drill cutting fines	0.004m <sup>3</sup> /day
Sewage	Human waste	~ 0.05 m <sup>3</sup> /day
Camp greywater	Water from kitchen and sinks, showers	<3 m <sup>3</sup> /day
Combustible solid waste	Food wastes, paper, untreated wood (sent to incinerator daily)	~ 0.05 m <sup>3</sup> /day
Incinerator ash	Ash from the incinerator	0.3m <sup>3</sup> /day
Non-combustible solid waste - Scrap Metal	Empty drums nails/screws	<10 empty drums/day
Non-combustible solid waste – Plastics/Glass	Bags, bottles, packaging, Bottles, jars	~ 0.05 m <sup>3</sup> /day
Non-combustible solid waste - Equipment	Pumps, motors, fans, heaters, screens	Unknown/ Negligible
Non-combustible solid waste - Rubber Products	Tires, floor mats	Unknown/ Negligible
Waste oil	Used oil – hydraulic and motor oil	~ 0.01 m <sup>3</sup> /day
Contaminated soils	Contaminated soil/snow/water	Unknown

Table 2: Hazardous Wastes

Waste Type	Examples	Uses	Estimated Quantity Used
Petrochemicals - Diesel		Generators, Tent heating	~4 drums/day
Petrochemicals - Jet Fuel	Jet A or Jet B	Helicopter	~4 drums/day
Petrochemicals - Gasoline		Pumps, skidoos	~0.1 drum/day
Petrochemicals - Oil	Hydraulic, motor	Generators, skidoos	~ 0.001 m <sup>3</sup> /day
Solvents	Cleaning products	Cleaning	Negligible
Electronics	Computers, transformers	Camp operations	Negligible
Light bulbs	Regular bulbs, compact fluorescent tubes	Lighting	Unknown
Batteries	Dry cell batteries, lead-acid based batteries	GPS, computers, satellite phones, generators	Unknown

### 2.3. Waste Management Activities

The Waste Management Plan for the Angilak Property is designed to ensure the proper handling, storage, transportation, recycling, treatment and disposal of hazardous wastes to reduce the potential impacts waste could have on the environment and workers health and safety (Guideline for the General Management of Hazardous Waste, 2010). To reduce the amount of waste generated, materials will be used efficiently. Wastes created will be sorted and classified according to its specific characteristics and handled appropriately.

These waste management practices have been proven in cold climates.

### 2.4. Waste Reuse and Recycling

To reduce the amount of waste generated, Kivalliq Energy will engage in reusing and recycling materials whenever possible. Metal and wood will be repurposed to its full extent. Scrap metal will be removed from the property regularly and shipped south to an authorized metals recycling facility. Recyclable glass and plastics will be segregated accordingly and will be removed from the property regularly and shipped south to an authorized recycling facility.

## 3. Waste Classification and Disposal Plan

### 3.1. Hazardous Wastes

All hazardous waste materials will be collected in sealed and appropriately labeled containers and stored in secondary containment. All hazardous wastes will be removed from the property regularly for recycling or authorized disposal. Hazardous wastes will be transported in accordance with the Transportation of Dangerous Goods (TDG) and International Air Transport Association (IATA) regulations. Refer to the "Fuel

Management Plan” for policies and procedures dictating the safe transport, storage and handling of fuels and other hazardous materials. Refer to the “Spill Contingency Plan” for the policies and response procedures to be followed in the event of a spill.

#### **3.1.1. Used Oil**

Waste oil from generators, pumps, vehicles or other equipment will be collected and stored in sealed and labeled 205L drums. All waste oils will be removed from the property regularly and will be transported south to an authorized hazardous waste disposal facility.

#### **3.1.2. Hydraulic Fluid**

Waste hydraulic fluids will be collected and stored in sealed and labeled 205L drums. Waste hydraulic fluids drums will be removed from the property regularly and will be transported south to an authorized hazardous waste disposal facility.

#### **3.1.3. Contaminated Fuels**

Contaminated and waste fuels will be collected and stored in sealed and labeled 205L drums. All contaminated and waste fuels will be removed from the property regularly and will be transported south to an authorized waste disposal facility.

All drummed fuels will be stored in secondary containment berms, in organized horizontal rows, with bungs tightly secured and oriented at 3:00 and 9:00 o’clock positions to mitigate moisture inflow. All drummed fuels will be clearly labeled in accordance with the Workplace Hazardous Materials Information System (WHMIS) which includes the name of the fuel provider, the date the drum was filled and the type of fuel contained within. Drummed jet fuel has a limited drum life of two years after which it must be retested to confirm that it remains compliant with the requirements of the Canadian General Standards Board specified for Aviation Turbine Fuel. All efforts will be made to use jet fuel prior to the expiry date specified on the individual drums. In the event that the drum is not used prior to the expiry date the fuel will be tested and recertified so as to avoid designation as waste fuel.

#### **3.1.4. Solvents**

Whenever possible, non-toxic alternatives will be used in place of petroleum based solvents. Waste solvents will be sealed in their original containers and stored in the hazardous waste storage area. Those containers will be removed from the property regularly and transported to an approved disposal facility.

#### **3.1.5. Contaminated Snow and Ice**

All contaminated water, ice and snow will be cleaned up immediately and contained in sealed and appropriately labelled 205L drums and stored in secondary containment berms. Drums containing contaminated water ice or snow will be removed from site regularly and transported to an approved disposal facility. Please refer to the “Spill Contingency Plan” for additional procedures for spills resulting with contaminated water, snow and ice.

#### **3.1.6. Contaminated Soils**

All contaminated soils will be cleaned up immediately and contained in sealed and appropriately labelled 205L drums and stored in secondary containment berms. Drums containing contaminated soils will be



removed from site regularly and transported to an approved disposal facility or pending the appropriate authorizations, contaminated soils may be remediated by soil farming. Please refer to the “Contingency Plan” for additional procedures for spills resulting with contaminated soils.

#### **3.1.7. Used Rags and Sorbents**

Used rags and sorbent pads will be incinerated on site in a duel chamber, forced-air incinerator. Granular sorbents will be placed in sealed and labeled containers and stored in the hazardous waste storage area and will be removed from site regularly and transported to an authorized disposal facility.

#### **3.1.8. Empty Drums and Hazardous Materials Containers**

After use, all fuel drums will be drained of residual contents. These will be aggregated into 205L waste fuel drums. All empty drums and hazardous materials containers will be stored in a designated area. Empty drums will be removed from site regularly and transported south to be returned to the supplier for recycling or to an authorized facility for disposal.

#### **3.1.9. Waste Batteries**

Dry cell batteries (AAA to D cell, 6 or 9 volt) will be collected in a designated container and backhauled to an approved recycling facility.

Waste lead acid batteries will be packaged in accordance with TDG Regulations and will be removed from site regularly. All waste lead acid batteries will be transported south for disposal at an authorized facility.

#### **3.1.10. Aerosol Cans**

Empty aerosol cans will be stored in a designated and appropriately labelled container and will be backhauled for proper disposal.

#### **3.1.11. Fluorescent Bulbs and Tubes**

If possible, waste fluorescent bulbs and tubes are packaged in their original container and backhauled to an accredited facility. Fluorescent bulbs and tubes are considered hazardous if broken. Broken bulbs/tubes are: collected in a sealed drum; labeled and shipped to a registered hazardous waste receiver.

### **3.2. Inert Non-Combustible Solid Wastes**

#### **3.2.1. Tires and Other Rubber Materials**

Tires and other rubber materials that cannot be patched or repurposed will be backhauled for proper recycling/disposal.

#### **3.2.2. Scrap Metal**

Scrap metal will be repurposed as much as possible. Scrap metal will be removed from the property regularly and shipped south to an authorized metals recycling facility.

#### **3.2.3. Glass**

All waste glass will be stored in a sealed and clearly marked container. Waste glass will be removed from site regularly and shipped south for recycling at an authorized facility.

#### **3.2.4. Electronics**

Electronics and electrical equipment will be collected in a container. Waste electrical equipment will be removed from site regularly and shipped south for disposal or recycling at an authorized facility.

#### **3.2.5. Vehicles and Other Mechanical Equipment**

Broken vehicles and mechanical equipment that is unserviceable and no longer functioning will be removed from site and transported south for refurbishing or disposal at an authorized facility.

### **3.3. Inert Combustible Solid Wastes**

All Inert Combustible Solid Wastes will be incinerated in a dual chamber, fuel fired, forced-air incinerator in accordance with the Nunavut Environmental Guidelines for the Burning and Incineration of Solid Waste and Canada-Wide Standards for Dioxins and Furans. Ash generated from the on-going incineration will be stored in sealed 205 L drums. Ash drums will be removed from site regularly and transported south for disposal at an authorized facility.

#### **3.3.1. Food Waste and Packaging**

Food waste and packaging will be incinerated in accordance with the Nunavut Environmental Guidelines for the Burning and Incineration of Solid Wastes. Ash generated from the on-going incineration of food waste and packaging will be stored in sealed 205 L drums. Ash drums will be removed from site regularly and transported south for disposal at an authorized facility.

#### **3.3.2. Paper and Cardboard**

Paper and cardboard will be incinerated in accordance with the Nunavut Environmental Guidelines for the Burning and Incineration of Solid Wastes. Ash generated from the on-going incineration of paper and cardboard will be stored in sealed 205 L drums. Ash drums will be removed from site regularly and transported south for disposal at an authorized facility.

#### **3.3.3. Waste Lumber**

Unusable waste lumber will be incinerated in accordance with the Nunavut Environmental Guidelines for the Burning and Incineration of Solid Wastes. Ash generated from the on-going incineration of waste lumber will be stored in sealed 205 L drums. Ash drums will be removed from site regularly and transported south for disposal at an authorized facility. Untreated, larger pieces of lumber will be burned in a controlled open burn in compliance with the Municipal Solid Wastes Suitable for Open Burning Guidelines.

### **3.4. Sewage**

Pacto toilets are used at the Nutaaq Camp. Bags containing black water waste will be incinerated in accordance with the Nunavut Environmental Guidelines for the Burning and Incineration of Solid Wastes. Ash generated from the incineration of Pacto wastes will be sealed in designated 205 L drums and labelled accordingly. Ash drums will be removed from site regularly and transported south for disposal at an authorized facility.

## 4. Site Facilities

### 4.1. Hazardous Waste Storage Area

All hazardous waste materials will be stored in secondary containment at the Nutaaq Camp. The hazardous waste storage area will be a minimum of 31 metres from the normal high water mark of any water body and such that there is no possibility of a potential spill entering any water body. All hazardous wastes will be sealed and labelled in containers and stored in the hazardous waste storage area until they can be backhauled for recycling or authorized disposal.

Secondary containment berms will be equipped with Spilfyter RailMat 3 ply hydrocarbon absorbent fabric (or similar) and Rain Drain hydrocarbon filters for water drainage. Secondary containment structures will be capable of holding 110 percent of the volume of the largest fuel reservoir that is housed within the secondary containment. These structures will be of sufficient height and depth to hold any potential spill or failure and will be made of material that is sufficiently durable to withstand Nunavut's climate and the natural terrain. Secondary containment structures will comply with all applicable federal and territorial laws, regulations and guidelines.

### 4.2. Incinerator

The Nutaaq Camp has an A400 Inciner8 incinerator at the south end of the camp compound 25 metres south of the camp generator shed. All combustible waste will be incinerated in accordance with the Nunavut Environmental Guideline for the Burning and Incineration of Solid Waste and Canada-Wide Standards for Dioxins and Furans. Ash generated from the on-going incineration will be stored in sealed metal 205 L drums and removed from site regularly to be transported south for disposal at an authorized facility.

### 4.3. Sump

Waste water from the Nutaaq Camp will be discharged to a grey water sump. A grease trap and screens will be installed on the kitchen drain to ensure grease and food solids do not enter the sump. The discharge pipe into the sump will be inaccessible to wildlife. The grey water sump will be located at least 31 metres away from a water body.

## 5. Training

Site and job-specific training will be provided to all personnel who are required to handle waste materials. Kivalliq will have a Level 3 First Aid Attendant on site during operations. The Camp Manager is required to oversee the handling of hazardous wastes and must have valid First Aid and WHMIS. On site management are responsible for the transportation of hazardous wastes and have Transportation of Dangerous Goods (TDG) certification. All employees and contractors will receive training in Fuel and Waste Management and Spill Response, as outlined in the Angilak Property Fuel Management Plan, Waste Management Plan and Spill Contingency Plan.

Personnel responsible for operating or maintaining the incinerator will receive hands on training to ensure the equipment is operated safely and efficiently in accordance with the Nunavut Environmental Guidelines for the Burning and Incineration of Solid Wastes.

## **6. Inspection and Monitoring**

Inspections of the hazardous waste storage area and other waste storage facilities to ensure the hazardous waste inventory is up to date, secondary containment is in place and in good condition, and that spill kits are fully stocked will be conducted weekly. Daily monitoring of the hazardous waste storage area and the contained wastes will include an assessment of the condition of waste receptacles and storage containers, checking for any damaged or leaking containers or berms, and ensuring that waste is collected and stored in the correct containers and safely placed in the storage area. Waste inspections will be completed in conjunction with the fuel storage inspections outlined in the Angilak Property “Fuel Management Plan.” Any leaks or spills will be treated as outlined in the Angilak Property “Spill Contingency Plan.”

The Project Supervisor is responsible for supervising the monitoring and inspection program, and keeping a detailed inventory of all hazardous wastes on site.