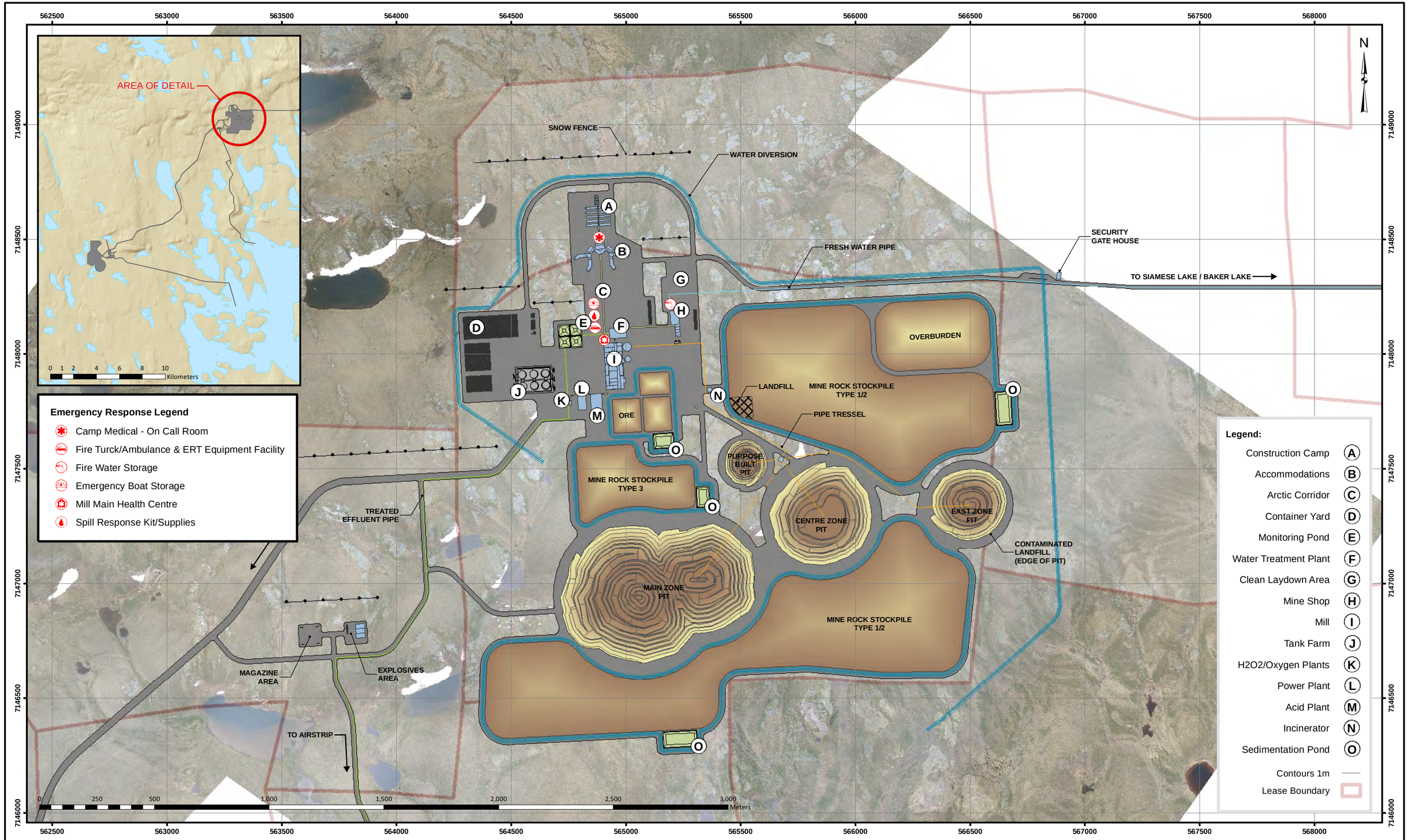

Projection: NAD 1983 UTM Zone 14N
Creator: CDC Revised:TL
Date: 07/07/2014 Scale: 1:15,000
Data Sources: *AREVA Resources Canada Inc.*

FIGURE 3.3-2
KIGGAVIK GENERAL SITE LAYOUT

ENVIRONMENTAL IMPACT STATEMENT
VOLUME 10 - APPENDIX 10B

File: Q:\SHEQ\GIS\KIGGAVIK\2014\EIS\Tier 3\Appendix 10B - Spill Contingency Plan\Maps\MXD\Figure 3.3-2 Kiggavik General Site Layout.mxd

Kiggavik Project

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Table 3.3-1 Summary of Kiggavik Site Infrastructure

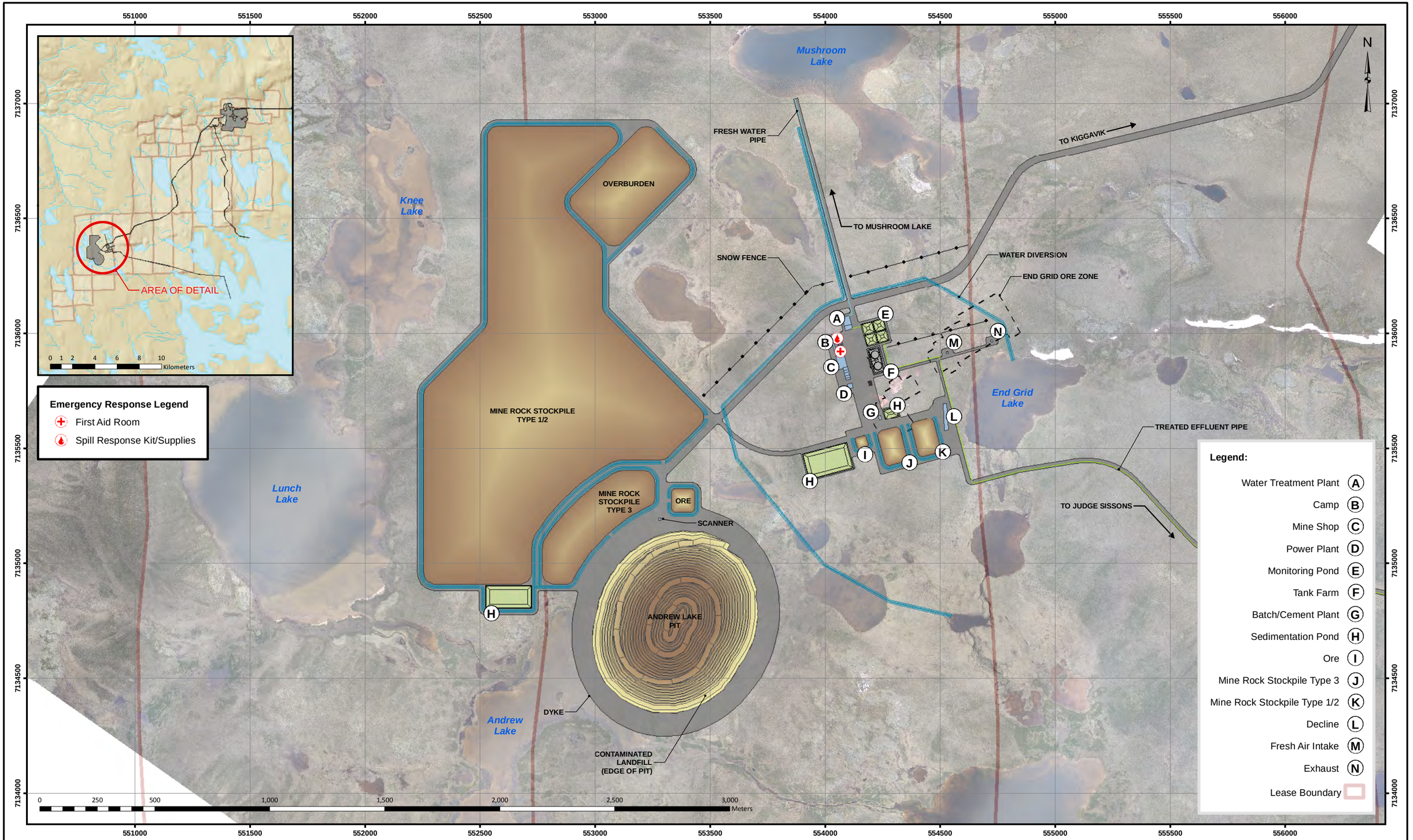
Facility	Dimensions	Containment		Key Features
		Yes	No	
Access				
Baker Lake – Kiggavik Winter Access Road	40 m (on ice) x 99 km		✓	• 3 month seasonal road • Includes emergency shelters for personnel
Baker Lake - Kiggavik All-Season Access Road	10 m x 110 km		✓	• All-season road with cable ferry – ice bridge crossing Thelon • 8 month service • Includes emergency shelters for personnel
Kiggavik - Sissons Access Road	20 m x 17.8 km		✓	• Haul road
Access Road to Siamese Lake	10 m x 6.9 km		✓	• Service road for fresh water line, includes power line • Overlays portion of the winter road route
Access Road Kiggavik to Judge Sissons Lake	10 m x 14 km		✓	• Service road for treated effluent discharge line, includes power line
Pointer Lake Airstrip	150 m x 2300 m	✓		• Contained storage of deicing fluid and aviation fuel • Gravel airstrip (not contained)
Mining				
Mine Shop	38 m x 114 m	✓		
Explosive Storage	80 m x 80 m		✓	• 10,000t combined capacity
Milling				
Mill	78 m x 200 m	✓		• Up to 4,000 tonnes U per year
Acid Plant	50 m x 80 m	✓		• 310 t/day 100% H_2SO_4
Oxygen Plant	10 m x 20 m	✓		• 30 t/day
Peroxide Storage	10 m x 10 m	✓		• 50% solution
Tailings Management	3 in-pit TMFs	✓		• East Zone, Centre Zone, Main Zone
Water Management				
Water Treatment Plant	74 m x 44 m	✓		• 5,560 m3/day capacity • UF pre-treatment, RO, chemical treatment
Monitoring Ponds	100 m x 100 m	✓		• 3 -12 h holding ponds
Fresh Water Pipe	12 " x 8.7 km		✓	• To Siamese Lake
Treated Effluents Discharge	10" x 14 km	✓		• Discharge to Judge Sissons Lake

Table 3.3-1 Summary of Kiggavik Site Infrastructure

Facility	Dimensions	Containment		Key Features
		Yes	No	
Pipe				
Purpose Built Pit	28635 sq.m	✓		• Storage of site drainage
Water Diversion Structures	6292 m		✓	• Fresh water diversion
Power				
Power Plant	35 m x 67 m	✓		• 20.95 MW installed (13.0 MW peak load)
Tank Farm	159 m x 117 m	✓		• 6 -10 ML tanks
Warehousing				
Container Yard	312 m x 326 m	✓		• Sized for approximately 4,200 containers stacked 4 high
Clean Storage	100 m x 195 m		✓	
Accommodation				
Permanent Camp	230 m x 135 m		✓	• 400 single rooms
Construction Camp	105 m x 140 m		✓	• 750 peak workforce

3.3.2 Sissons Site

Locations of key infrastructure components are shown on the Sissons site layout (Figure 3.3-3). A list of infrastructure to be designed for the Sissons site is provided in Table 3.3-2.



Projection: NAD 1983 UTM Zone 14N
Creator: CDC Revised: TL
Date: 07/07/2014 Scale: 1:15,000
Data Sources: *AREVA Resources Canada Inc.*

FIGURE 3.3-3
SISSONS GENERAL SITE LAYOUT

ENVIRONMENTAL IMPACT STATEMENT
Volume 10 - APPENDIX 10B

File: Q:\SHEQ\GIS\KIGGAVIK\2014\EIS\Tier 3\Appendix 10B - Spill Contingency Plan\Maps\MXD\Figure 3.3-3 Sissons General Site Layout.mxd

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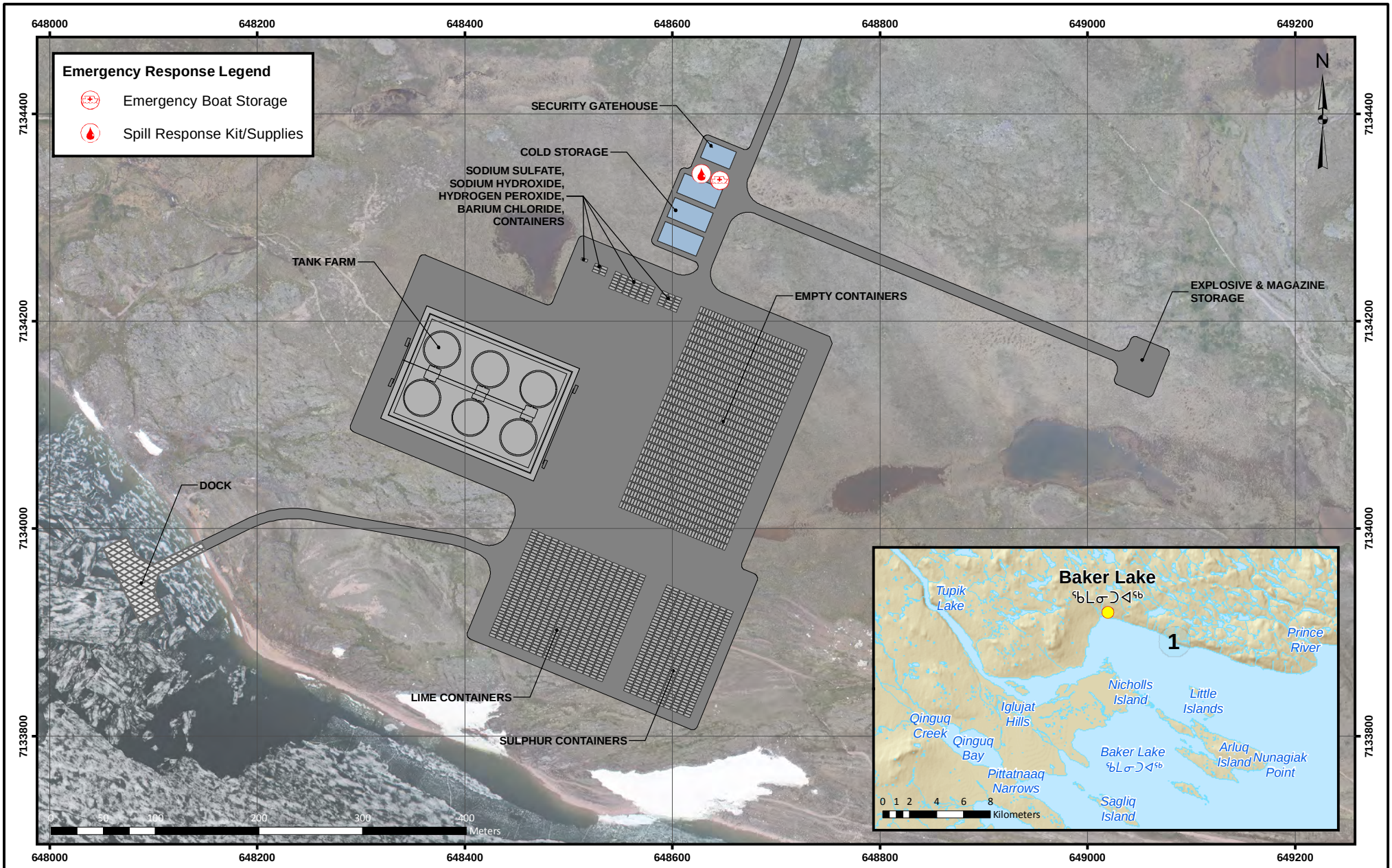
Table 3.3-2 Summary of Sissons Site Infrastructure

Facility	Dimensions	Containment		Key Features
		Yes	No	
Access				
Access Road to Mushroom Lake	10 m x 909 m		✓	• Service road for fresh water line, includes power line
Access Road Sissons to Judge Sissons Lake	10 m x 10.4 km		✓	• Service road for treated effluent discharge line, includes power line
Services				
Mine Shop and Offices/dry	38 m x 114 m	✓		• Services underground and surface fleets - light duty function
Cemented Rock Fill Plant	10 m x 20 m		✓	• 60 tonnes CRF per hour
Water Management				
Water Treatment Plant	32 m x 60 m	✓		• Chemical treatment • 1,700 m3/d nominal capacity
Monitoring Ponds	100 m x 100 m	✓		
Treated Effluent Discharge Pipe	6” x 12km			• Discharge to Judge Sissons Lake • 12 km long
Water Diversion Structures	3797 m		✓	• Fresh water diversion
Power				
Power Plant		✓		• 7.65 MW (3.8MW peak load)
Tank Farm	58 m x 117 m	✓		• 2 – 10 ML tanks
Warehousing				
Container Yard	40 m x 40 m		✓	
Emergency Camp	45 m x 55 m		✓	

3.3.3 Baker Lake Port

The location of the key infrastructure components are shown on the Baker Lake port facility layout (Figure 3.3-4). A list of infrastructure to be designed for the Baker Lake site is provided in Table 3.3-3.



Projection: NAD 1983 UTM Zone 14N
Creator: CDC
Date: 09/01/2011 Scale: 1:5,000
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Data Sources: *Areva Resources Canada Inc.*

FIGURE 3.3-4
BAKER LAKE DOCK GENERAL SITE LAYOUT

ENVIRONMENTAL IMPACT STATEMENT
VOLUME 10 - APPENDIX 10B

Kiggavik Project

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Table 3.3-3 Summary of Baker Lake Site Infrastructure

Facility	Dimensions	Containment		Key Features
		Yes	No	
Temporary Dock	25 x 80 m		✓	• 7,500 t barge docking
Marshalling Area				
Tank Farm (OHF)	159 m x 117 m	✓		• 7 -10 ML tanks
Reagents Container Storage	210 m x 111 m	✓		• Sized for approximately 4200 containers stacked 4 high
Other Container Storage	210 m x 111 m		✓	• Sized for approximately 4200 containers stacked 4 high
Explosive Storage	40 m x 40 m		✓	• 10,000 tonne capacity
Offices	40 m x 20 m		✓	
Access				
Road to Baker Lake	20 m x 1.5 km		✓	• connects into AEM Meadowbank dock road

4 Petroleum Products

Based on the large volume of fuel required to be transported and stored at the Kiggavik Project, this represents the largest potential for spills to occur. Community members noted concern about potential fuel and diesel spills (IQ-CI09 2009[10], EN-CI OH Nov 2012[11]) and AREVA's plan to handle spills (EN-KIV OH Oct 2009[12]). The following section identifies the pre-development and operational inventory, storage volumes and locations, and transfer protocols for the handling of petroleum products.

4.1 Petroleum and Chemical Product Storage and Inventory

The design basis for all petroleum storage on site is the CCME Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products, 2003.

The operational and maintenance requirements for all petroleum storage and handling on site are based on the CCME Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products, 2003 and in compliance with the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*, under the *Canadian Environmental Protection Act, 1999* (CEPA 1999).

[10] IQ-CI09 2009: *The risk of fuel spills is also a worry*

[11] EN-CI OH Nov 2012: *What about the risk of a diesel spill?*

[12] EN-KIV OH Oct 2009: *Our concern is with the spills because there is a lot of wildlife such as polar bears, seals, caribou, and so on. Do you have a management plan to deal with spills?*

4.1.1 Pre-development Inventory

Table 4.1-1 lists products (not inclusive) currently used, along with the maximum amount stored at the Kiggavik exploration camp.

Table 4.1-1 Pre-Development Inventory of Hazardous Materials

Chemical/Material	Amount	Storage Type
Diesel Fuel	250,000 L	EnviroTanks
Jet B Fuel	223,040 L	EnviroTanks
Gasoline	1,025 L	Secondary Containment
Generator Oil	20 x 20L (400 L)	Secondary Containment
Hydraulic Oil	20 x 20L (400 L)	Secondary Containment
Engine Oil	20 x 20L (400 L)	Secondary Containment
Propane	75 x 100 lbs (7500 lbs)	Secondary Containment
Grease	5 cases x 12 tubes (60 tubes)	Secondary Containment
Salt	50,000 lbs	Secondary Containment
Cement	15,000 lbs	Secondary Containment

A specific inventory of all petroleum and chemical products used during the field operations is maintained at site.

4.1.1.1 Fuel Tanks

To accommodate increased fuel demand and reduce the potential of fuel spills, bulk fuel storage tanks were installed. Eight double-walled steel EnviroTanks, each with a capacity of 50,000 L were installed at the esker located on the Kiggavik lease, west of the Kiggavik camp at the coordinates 14W 561512, 7145240. Three tanks on the north side of the esker are for the storage of Jet-B fuel, and five tanks on the south side of the esker are for the storage of diesel fuel.

10,000 L fuel bladders containing Jet-B or P-50 diesel fuel are transported to the fuel cache during the winter via ground transport (snow cats, foremosts or other tundra trucks). The fuel is then transferred from the fuel bladders to the EnviroTanks.

Double walled steel EnviroTanks and associated pump meet the requirements of secondary containment within their own structure. Further protection against spills is provided by high-level alarms, overfill preventers, and catch basins around each fill pipe.

4.1.1.2 Fuel Drums

The cache of fuel drums at the Kiggavik Camp is presently located at the coordinates 14W 564464 7146782. Unleaded gasoline and propane cylinders may be brought to site during the winter haul or by aircraft from Baker Lake. Diesel fuel may be transferred from the EnviroTanks to drums or double-walled fuel tanks for use in camp and/or drill sites.

Drums of diesel fuel and unleaded gasoline at the Kiggavik Project are stored in approved 205 L steel drums within secondary containment systems at the campsite. The secondary containment system presently being used is adequate to contain 110% of the total aggregate storage capacity of the drums. Secondary containment is used for all liquid fuels, and lubricants. Drill additives are stored in sea containers to keep away from moisture.

4.1.2 Operational Inventory

All equipment on site will be operated using common arctic grade diesel fuelled generators. A power generation unit will likely be required at both Kiggavik and Sissons sites. The majority of large site equipment will operate on diesel fuel. As well, gasoline may also be required on site.

The Kiggavik project total peak annual fuel consumption has been estimated to be 65 million liters (ML) with an average of 49 ML over the production period. This total includes all fuel required for heat and power and mobile mine equipment and general site vehicles.

The Baker Lake facility will receive fuel from barges during the two summer months and be able to hold enough fuel for the Project. Fuel will be transported to the Kiggavik site on a winter road during the three winter months (refer to Appendix 2U -Hazardous Materials Plan). It is estimated that during the peak consumption year, fuel storage of up to 70 ML may be required at Baker Lake; with 50 ML of fuel storage at Kiggavik site and 20 ML of fuel storage at Sissons site. Therefore seven 10 ML tanks at Baker Lake, five 10 ML tanks at Kiggavik site and two 10 ML tanks at Sissons site will be required. The current design conservatively considers six tanks at Kiggavik and two tanks at Sissons to allow for flexibility in fuel storage at the Kiggavik site. Figures 3.3-2, 3.3-3, and 3.3-4 show the proposed tank farm configurations at these locations.

4.1.2.1 Secondary Containment Areas

Secondary containment areas required to contain fuel volume are designed according to the National Fire Code: their volume is the sum of the size of the largest tank (10 ML) and ten percent of the volume of the remaining tanks. For a tank farm of 6 tanks of 10 ML capacity, the secondary containment volume is therefore 15 ML.

A base of coarse gravel of approximately 1000 mm thickness with a 40 mm thick fine gravel layer will provide a foundation for the dike area. In order to prevent absorption of fuel by the soil if a tank leaks, a membrane will be applied in the dike area. To prevent puncture of the membrane, 80 mm of sand will be packed on both sides. A geotextile layer and fine gravel will be located above and below the membrane and sand. Along the top of berm walls, an anchoring trench will be needed to secure the member and geotextile layers. Under tanks, a thicker layer of fine gravel will be used, with a slope of about 10 to 1 to the floor of the berm. A thin layer of sand will also be used to prevent high stresses to the metal on the underside of the tank.

All tanks will have a capacity of 10 ML, with diameter of 34 m and height of 12 m. Stairs and handrails will be provided on all tanks. All piping will be constructed over the berm walls rather than penetrate through them.

4.2 Response Equipment

4.2.1 General Equipment

Automatic fire suppression equipment will be in place in all buildings occupied by personnel. Fire extinguishers will be located in clearly marked locations in accommodations, shops, fuelling stations, the cold storage warehouse, the helicopter pad and other areas where flammable substances are stored and/or handled. Spill kits will be located at the fuel farm, fuelling stations, airstrip, helicopter pad, and other locations where spills of hazardous substances could occur.

A checklist of the required items for each spill response kit or equipment storage area will be provided. Spill response supplies will be checked against the lists on a quarterly basis and any deficiencies remedied immediately. The checklists will be reviewed whenever new chemicals are added to on-site activities to ensure that relevant spill cleanup supplies are present. Material safety data sheets (MSDS), provided by all supplies of hazardous substances, will be accessible in case of an emergency, and will be updated as necessary.

4.2.2 Spill Kits

4.2.2.1 Pre-Development

AREVA has chosen two types of spill kits, which are considered to be industry standard and are available on site for use during pre-development activities. These include a 135 L universal emergency response kits and 95 US gallon drum overpack kits. The resources in these kits include:

- absorbent compound;
- booms;
- socks;
- pads; and
- protective equipment such as gloves, safety glasses and coveralls.

Due to the volume of fuel being stored in the fuel tank storage system and the remote nature of the sites, a minimum of one 95 US Gallon spill kit will be present for each 100,000 L of fuel stored.

In addition, the following spill response materials are readily available for spill response:

- Skimmers;
- Plugging compound;
- Bulk supplies of oil absorbent pads and socks;
- Aluminum or brass shovels and tools;
- Bonding cables; and
- MSDS sheets.

In addition, appropriate fire suppression equipment is stationed in each building, at the fuel tank storage system, and near each site where equipment is normally serviced and anywhere deemed advisable. A supply of sealable 20 L steel pails or 205 L drums will be reserved for the collection and storage of used absorbent materials.

4.2.2.2 Operations

Spill kits will be made available at fuel storage areas, airstrip, site vehicles, mill areas, maintenance shops, mining areas, and anywhere deemed advisable. Larger 425 L spill kits will be stationed at fuel storage locations, generator buildings, and within the mill.

Other spill kits will be available for acid spills and ammonium nitrate spills. These will be located within the mill areas and at the explosives storage area.

4.3 Petroleum Product Transfer

Smoking, sparks or open flames are prohibited in fuel storage and fuelling areas at all times. Petroleum transfer operations will be carried out by trained personnel.

4.3.1 Fuel Transport to Baker Lake

Fuel will be loaded at terminals in Montreal, Rotterdam or New York then transported to Ellis Island anchorage at the east end of Chesterfield Inlet using oceangoing Ice Class double hull tankers. The ocean going tankers will anchor at Ellis Island and lighter their cargoes into double hull barges. The double hull barges will also deliver the fuel direct to Baker Lake from southern ports. Double hull tankers may also deliver fuel to the tank farm in Churchill. Procedures for fuel transfer conforming to Transport Canada Guidelines are described in Technical Appendix 2J – Marine Transportation and summarized here.

A containment boom will be placed between the tanker and the bow and stern of the barge as a precautionary measure to contain any fuel should a spill occur. A work boat and a barge containing oil spill equipment barge will be stationed at Ellis Island during all fuel transfers. A containment boom which will encircle the entire length of the tanker and barge will be available onsite, ready to be deployed if necessary.

4.3.1.1 Oil Handling Facility

The oil handling facility (OHF) will be constructed and operated in accordance with Transport Canada Arctic Waters Oil Transfer Guidelines and Oil Handling Facility Guidelines. The OHF supervisors will be trained in accordance with Transport Canada Supervisor of Oil Transfer Operation course or equivalent.

Steel piping will lead down to the loading dock from the diesel fuel tank farm at Baker Lake. The discharge hose(s) will be connected to the fuel receiving manifold on the dock using dry break couplings. A powered hose reel and hose crane will be fitted on the barge. All connection points will be protected with save-alls. A ready use pollution kit will be stored on the dock. A containment boom will be deployed between the dock and the barge hull during fuel transfers as a precaution to contain any fuel that may accidentally spill.

A team of trained personnel will be in charge of the barge discharge equipment. Fire-fighting equipment will be fitted on the dock as well as on each barge as required by Transport Canada. For detail on the proposed OHF protocols for the Kiggavik Project, refer to Technical Appendix 2J – Marine Transportation Plan.

4.3.1.2 Oil Pollution Emergency Plan

The Oil Pollution Emergency Plan (OPEP) for the OHF will conform to the following Regulations:

- The Canada Shipping Act 2001 Part 8. Subsection 168 (applications north of 60º);
- The Canada Shipping Act Response Organizations and Oil Handling Facilities;
- Regulations (SOR/95-405);
- The Oil Handling Facilities Standards, TP12402;
- Northwest Territories, Nunavut Worker's Compensation Act;
- Mine Health and Safety Act and Regulations (Nunavut); and
- Canada Labour Code Part II.

The oil handling facility (OHF) consists of a tank farm with six (6) steel storage tanks arranged in two (2) rows of three (3) tanks. Each tank will be designed to carry 10 million litres (ML) of Ultra Low Sulphur Arctic Diesel. The tanks will be located within a berm designed to contain the capacity of the largest storage tank and 10 percent of the total capacity of all other storage tanks (i.e., 15 ML). A steel pipeline will be laid from the tank farm to a shore line manifold. A flexible marine floating bunker discharge hose will be laid from the shore manifold to a selected anchorage point for

double bottom shuttle tankers and/or double bottom barges Rapid response Oil Pollution Spill kits will be placed at strategic locations including the discharge manifold on the vessel, the receiving manifold in the OHF, the discharge manifold at the truck filling station and the OHF Pump location.

The OPEP will be developed with consideration of the following main objectives:

- Maximizing the safety of the OHF's operating personnel;
- Maximizing the safety of persons living near the OHF;
- Safeguarding the integrity of the OHF;
- Reducing the risk of fire and explosion;
- Reducing the risk of an oil pollution incident;
- Timely notification and reporting of an oil pollution incident;
- Reducing the environmental impact of an oil pollution incident; and
- Responding to the cleanup in an effective manner after an oil pollution incident.

The OPEP will describe measures to be taken in event of a spill. The OPEP requires that human resources and sufficient materials and equipment are located at or near the OHF to be completely self-sufficient to deal with a spill in the specified time frame as required by regulations. The OPEP will also include commercial arrangements with specialized Oil Spill Contractors which can be mobilized to assist in spill cleanup. Spill response at the OHF is discussed further in Section 5.2.1.

4.3.1.3 Shipboard Oil Pollution Emergency Plan

Shipboard Oil Pollution Emergency Plans (SOPEPs) are specific to each shipping vessel. Canadian regulations require every vessel navigating Canadian waters to have a Transport Canada approved SOPEP. For detail on SOPEP requirements for the Kiggavik Project, refer to Technical Appendix 2J – Marine Transportation Plan.

4.3.2 Fuel Transport to Kiggavik Site

Fuel will be transported to the Kiggavik site on an ice road during the three winter months and may be transported on the all-weather road periodically. Refer to Technical Appendix 2K - Winter Road Report, Technical Appendix 2L - All Season Road Report, and Technical Appendix 2U - Hazardous Materials Management Plan for further details on road alignment and fuel transport procedures.

Truck loading and fuelling stations will be built at the Baker Lake port and the Kiggavik and Sissons sites. All fuel being loaded onto trucks will be at a reduced pressure, by increasing the piping from 100 mm to 150 mm diameter pipes. The rate for diesel fuel transfer to or from the trucks is expected to be 27,000 L/h.

4.3.3 Fuel Transfer Incident

If any of the following conditions occur during petroleum product transfer, the transfer will be stopped immediately:

- Loss of communications;
- Loss of ability to monitor hose to shore;
- Sign of spillage, or damage to hoses and couplings;
- Any detection of accumulated gases;
- Major increase in wind and/or swells;
- When an electrical storm is present or predicted;
- Sever deterioration in ice or visibility conditions;
- Helicopter landings or take offs; and
- Any other situation deemed dangerous by the transfer supervisor.

A spill of fuel will be reported to the appropriate authorities (Attachment A), the cause of the spill will be fully investigated and any mitigative measures implemented. Spill reports are used as a continuous improvement tool and are reviewed periodically in order to prevent reoccurrence.

4.3.4 Post Transfer Procedures

When the transfer has been completed, the following procedures will be followed:

- Purge the hose and shut all manifold and tank valves; when purging ensure that no air will be introduced to the tanks at the shore facility;
- Sound all tanks, (after waiting for settling, if necessary), and confirm with both parties that quantities of fuel/cargo have been properly transferred;
- Stow hoses securely for sea passage;
- Complete transfer checklists;
- Ensure the ship's and facility's Oil Books and Checklists are signed, kept up to date, and retained for examination by a Pollution Prevention Officer or other authorized official, (by prior arrangement with Prairie and Northern Region, Marine, organizations may use their existing checklists for recording transfer preparation conditions, provided all major aspects are covered in those checklists); and
- Forward the transfer particulars checklist or a post-season summary of operations and quantities, for statistical records and prevention guidelines improvement purposes, to Prairie and Northern Region, Marine by the calendar year-end.

4.3.5 Remediation

The Kiggavik site general manager is responsible for ensuring that the services of a qualified mobile environmental response unit are available. This includes ensuring that contracts are in place for the provision of these services. Sites which require remediation will be addressed according to appropriate regulations and guidelines.

5 Spill Scenarios and Response Strategies

5.1 Potential Hazards

5.1.1 Pre-Development

Potential sources for spills have been identified at the Kiggavik exploration site as follows:

- Storage of drummed products: leaks or ruptures may occur. This includes drums of Jet-B, P-50 diesel, gasoline, waste fuel, and waste oil;
- Overfilling of tank(s) at the fuel tank storage system of Jet-B or P-50 diesel;
- Transfer of fuel from tank to drum and from drum to tank;
- Fire at the fuel tank storage system;
- Collision at the fuel tank storage system;
- Vandalism of fuel tank storage system;
- Propane cylinders: propane leaks may occur at the valves. All cylinders are secured at all times;
- Refuelling equipment such as diamond drill equipment, helicopters, camp generator, stoves and incinerators, wheeled vehicles, snowmobiles, and pumps;
- Incidents involving leaking or dripping fuels and oils may occur due to malfunctions, impact damage, lack of regular maintenance, improper storage, or faulty operation;
- Spills of acid from damage lead/acid batteries;
- Spill of radiologically contaminated drill cuttings during drilling operations or transport of totes; and
- Spill of potentially contaminated drill return water.

5.1.2 Operations

In addition, potential sources for spills during the construction and operational phases include:

- Leakage, puncture, collision, fire, vandalism, or overfilling of tank(s) at the fuel tank farms to be located at Baker Lake dock area and the Kiggavik and Sissons tanks farm areas;
- Refuelling of mine site equipment, site vehicles and planes;
- Fuel transfer piping and valves;
- Temporary storage containers (jerry cans, slip tanks);
- Spill of chemicals used in the milling process from tanks and piping;
- Spillage of ore from haul trucks; and
- Spill of de-icing fluid at Pointer Lake airstrip.

Kiggavik's Environmental Code of Practice discusses how to conduct activities so as to minimize the risk of a spill. Design measures to limit the infiltration and loss of released products will include geomembrane liners, containment berms, fuel aprons, and collection sumps.

In addition, the following measures will further minimize the potential for spills during fuel handling, transfer and storage:

1. Fuel transfer hoses with cam lock mechanisms to be used when transferring bulk fuel deliveries into the bulk storage tanks.
2. Carefully monitor fuel content in the receiving vessel during transfer. Always have additional absorbent pads on hand while transferring fuel.
3. Clean up drips and minor spills immediately.
4. Regularly inspect drums, tanks and hoses for leaks or potential to leak and for proper storage.
5. Create fuel caches in natural depressions that are located at least 30m from the normal high-water mark of any water body.
6. Inventory and reconciliation procedures developed to ensure tanks are not overtopped and to ensure that tank leakage is not occurring.
7. Overfill protection on tanks include visual and audible alarms; catch basins around fill pipe; additional secondary containment at transfer locations; corrosion protection.
8. Train personnel, especially those who will be operators, in proper fuel handling and spill response procedures. This training is to include a "mock" spill, review of spill kit contents and their use and reporting.

5.2 Spill Scenarios and Response Strategies

5.2.1 Spill at the Oil Handling Facility

In the event that a spill occurs while a vessel is transferring at the OHF, Transport Canada Marine Safety will be the governing body to ensure that procedures in the OPEP for the OHF and the SOPEP for the vessel are carried out as required by the *Canada Shipping Act.* The Canadian Coast Guard will monitor the spill response performance and may assume command of the operation if the response is not satisfactory. If a spill occurs at the OHF at times when a vessel is not loading or discharging; the governing body which monitors the spill response is the AANDC.

The Onsite Coordinator is responsible for implementing the following procedures:

- Activate the Spill Response Plan. Referring to the Agency Contact List (Attachment A) call the 24-hour Oil Pollution Line, AANDC water resources, Transport Canada Marine Safety, and the Canadian Coast Guard to advise of the spill event.
- Assume authority over the spill scene and personnel involved.
- Evaluate the initial situation and assesses the magnitude of the spill.

- Develop an overall plan of action and communicate that plan to the appropriate regulatory authority. Transport Canada.
- Collect photographic records of the spill event and cleanup efforts.
- Provide information and recommendations to AREVA Operations Manager regarding resource requirements (additional manpower, equipment, material, etc.) to complete the cleanup effort.
- Mobilize personnel and equipment to implement the cleanup.
- The On Site Coordinator shall be accessible to communicate with the Canadian Coast Guard-Transport Canada Marine Safety and AANDC during the oil spill response.
- Prepare an incident investigation and a root cause analysis for all oil spills.

The OPEP will describe measures to be taken in event of a spill. The OPEP requires that human resources and sufficient materials and equipment are located at or near the OHF to be completely self-sufficient to deal with a spill in the specified time frame as required by regulations. The OPEP will also include commercial arrangements with specialized Oil Spill Contractors which can be mobilised to assist in spill cleanup.

The OPEP will contain detailed Spill Response Scenarios prepared for:

- Spill Risks from transfers to the OHF from vessels/barges;
- Loading trucks at the OHF;
- Spill risks from storage tanks and other containers; and
- Spill risks from OHF piping/pump systems.

5.2.2 Spill of Fuel from Metal Drums, 10,000 L Fuel Bladders, or Fuel Tanks on Tundra

A puncture or rupture of containers containing liquid fuels should initially be assessed for risk of ignition. Sources of ignition will be extinguished or isolated from the spill area if safe to do so. Using appropriate personal protective equipment as described in the MSDS efforts should be undertaken to plug punctures with appropriate material from the spill kit (plugging compound or other improvised materials). Ruptures or holes should be high-centered to stop further spillage of fuel. Absorbent materials should be used to absorb spilled fuel. A containment berm should be built with soil, snow, absorbent socks and/or tarps to contain a large spill.

Remove the spilled products using absorbent material or soil, gravel or snow, placing all recovered spilled fuel and spent absorbents into appropriate containers (metal cans, pails or drums in good condition). Again, all fuel skimmed or wicked off of the ground is to be disposed of, in appropriate steel containers. High-centered ruptures will be used as a point of entry for manually-operated fuel transfer pump suction tubes, and remaining fuel is removed to a sound drum. Small amounts of contaminated soil, vegetation or gravel is removed and placed into sealable steel drums and or pail and then disposed of appropriately. Large areas of spilled product on the ground are only to be remediated after consultation with AREVA environmental personnel and regulators.

Before commencing any removal of soil, gravel or vegetation regulatory agencies will be contacted.

If a spill of significant volume occurs at one of the fuel storage tanks or from a 10,000 L fuel bladder attempt to prevent the spread of the fuel if safe to do so and immediately contact AREVA personnel to obtain assistance with the spill response and clean-up.

5.2.3 Spill of Fuel on Land

Response to spills on land will include the general procedures previously detailed. Main spill control techniques involve the use of two types of barriers: dykes and trenches. Barriers should be placed down gradient from the source of the spill, and as close as possible to the source of the spill. Barriers slow the progression of fuel and also serve as containment to allow recovery of the fuel.

Depending on the volume spilled, the site of the spill as well as available material, a dyke may be built with soil, booms, lumber, snow, etc. A plastic liner should be placed at the foot of and over the dykes to protect the underlying soil or other material and to facilitate recovery of the fuel. Construct dykes in such a way as to accumulate a thick layer of free product in a single area (V-shaped or U-shaped).

Trenches are useful in the presence of permeable soil and when the spilled fuel is migrating below the ground surface. A plastic liner should be placed on the down-gradient edge of the trench to protect the underlying soil. Liners should not be placed at the bottom of the trench to allow water to continue flowing underneath the layer of floating oil.

The use of large quantities of absorbent materials to recover large volumes of fuel should be avoided. Large volumes of free-product should be recovered, as much as possible, by using vacuums and pumps, and containerized. Mixtures of water and fuel may be processed through an oil-water separator. Absorbent sheets should be used to soak up residual fuel on water, on the ground (soil and rock), and on vegetation. Peat moss may also be sprinkled on vegetation to absorb films of petroleum products.

5.2.4 Spill of Fuel on Water

The following elements must be considered when conducting response operations:

- type of waterbody or water course (lake, ocean, stream, river);
- water depth and surface area;
- wind speed and direction;
- presence and range of tides;
- type of shoreline; and
- seasonal considerations (open-water, freeze-up, break-up, frozen).

Containment of a diesel fuel slick on the ocean requires deployment of mobile floating booms to intercept, control, contain, and concentrate (i.e., increase thickness) the floating oil. One end of the booms is anchored to shore while the other is towed by a boat and used to circle the diesel fuel slick and return it close to shore for recovery using a skimmer. Reducing the surface area of the slick increases its thickness and thereby improves recovery. Mechanical recovery equipment (*i.e.,* skimmers and oil/water separators) will be mobilized to site if required.

If diesel fuel is spilled in a lake it may not be possible to deploy booms using a boat. In this case, measures are taken to protect sensitive and accessible shoreline. The diesel fuel slick is monitored to determine the direction of migration. In the absence of strong winds the oil will likely flow towards the discharge of the lake. Measures will be taken to block and concentrate the oil slick at the lake discharge using booms where it will subsequently be recovered using a portable skimmer, a vacuum, or sorbent materials.

In small slowly-flowing rivers, streams, channels, inlets or ditches, inverted weirs (i.e., siphon dams) may be used to stop and concentrate moving diesel fuel for collection while allowing water to continue to flow unimpeded. In the case of floating diesel fuel in a stream heading for a culvert (i.e., at a road crossing) a culvert block is used to stop and concentrate moving fuel for collection while allowing water to continue to flow unimpeded. In both cases diesel fuel will then be recovered using a portable skimmer or sorbent materials.

In the case of spills in larger rivers, with fast moving currents, diversion booming may be used to direct the oil slick ashore for recovery. Single or multiple booms may be used for diversion. Choosing a section of a river that is both wider and shallower makes boom deployment easier.

5.2.5 Spill of Fuel on Snow or Ice

In general, snow and ice will slow the movement of hydrocarbons. The presence of snow may also hide the diesel fuel slick and make it more difficult to follow its progression. Snow is generally a good natural sorbent, as hydrocarbons have a tendency to be soaked up by snow through capillary action.

However, the use of snow as a sorbent material is to be limited as much as possible. Snow and frozen ground also prevent hydrocarbons from migrating down into soil or at least slow the migration process. Ice prevents seepage of fuel into water.

Response to spills on snow and ice includes the general procedures previously detailed. Most response procedures for spills on land may be used for spills on snow and ice. The use of dykes (i.e., compacted snow berms lined with plastic sheeting) or trenches (dug in ice) slow the progression of the fuel and also serve as containment to allow recovery of the fuel.

Free-product is recovered by using a vacuum, a pump, or sorbent materials. Contaminated snow and ice is scraped up manually or using heavy equipment depending on volumes. The contaminated snow and ice is placed in containers or within lined berms on land. Contaminated snow and soil will

be transported to the designated landfarm area at Kiggavik or shipped offsite for processing at a licensed facility.

5.2.6 Leak of Fuel from Distribution Lines

A detected leak from a fuel storage tank and/or distribution line assembly will be initially assessed for risk of ignition. Sources of ignition are to be extinguished or isolated from the leak if safe to do so. If safe to do so, the shut-off valve on the tank and/o distribution line is to be turned off. Absorbent material is placed on the spilled fuel; if spilled onto snow or ice it is scooped up with an aluminum (non-sparking) shovel and stored in an appropriate sealable steel container. Ultimate disposal of these materials is only to be done after consultation with site environmental personnel and the appropriate regulatory agency.

5.2.7 Fire at Fuel Storage Tanks

In the event that a fire occurs at the fuel storage tanks, it is AREVA's primary intentions to ensure the safety of site personnel by allowing the fire to burn. Appropriate third party personnel will be contacted to ensure proper response and clean up occurs.

5.2.8 Crash at Fuel Storage Tanks

Current risk of a crash occurring at either fuel tank storage system location is minimal due to the absence of vehicles at the field program sites. During the operational period, crash protection will be installed at appropriate intervals around tank farms and critical facilities.

To assist aircrafts and helicopters with landing and takeoff, wind socks are placed at each location.

5.2.9 Release of Propane

No attempt should be made to contain a propane release.

Water spray can be used to knock down vapours and to reduce the risk of ignition.

Small fires can be extinguished with dry chemical or CO_2.

Personnel shall withdraw from the area immediately upon identifying a leak and shall not return until the leak is stopped and all the vapours have diffused. Contact will be made with the proper agency for disposal instructions of a defective container.

5.2.10 Loss of Shipping Container Overboard

Although the loss of a shipping container overboard during transit to Baker Lake is very remote, it may occur. The design of an ISO shipping container is such that they will remain afloat even when they are loaded to their maximum capacity. The loading doors on an ISO shipping container are fitted with seals to prevent the ingress of water. Calculations indicate that a container may remain afloat for approximately 50 – 60 days depending on the container load taking into account minor water leakage at the door seals. For shipping containers found at sea, towline(s) are attached to the floating container, and the container would be towed to the nearest dock where it would be recovered using cranes and other equipment.

The Through Transport Club, which insures 70% of the world's containership fleet, states that the incidence of containers being lost at sea is about 0.006% of the total number of containers shipped (TTC, 2002). This anticipated rate of loss translates to a total of two shipping containers which may be lost at sea for the entire life of the Kiggavik Project. Sea conditions that would produce such a loss might occur while the vessels are transiting along the Labrador coast or to a lesser extent in Hudson Bay. The likelihood of a shipping container being lost overboard within the sheltered waters of Chesterfield Inlet or Baker Lake is extremely remote. DesGagnés Transarctik Inc., a leading marine shipping company with over 20 years of experience delivering cargo to the eastern Arctic, has never experienced the loss of a shipping container overboard (Gaudreau, 2013).

Nearly all accidents involving spills from shipping containers relate to overloading of the container, unsecured loads within the container, and/or structural failure caused by severely corroded containers. All shipping containers used for the Kiggavik Project will be inspected for container integrity. The shipping container maintenance history will be tracked by its serial number. Each shipping container will be loaded with supplies at its origin in accordance with a pre-approved securing plan. The contents of each shipping container will be recorded and tracked at all times within a material management system. The weight of each shipping container will be verified at the load point to ensure that no overloaded containers enter the shipping system.

Container lifting spreaders will be used to lift shipping containers from their top lifting points. The spreaders have a safety feature which prevents the locks from being disconnected from the shipping container when there is a load on the spreader. This ensures that the shipping container has been placed in a secure location before being released from the spreader. The spreader will also have guide bars which allow it to be positioned correctly over the shipping container to be lifted. Spreaders can also be used to rotate the shipping container as required. The shipping containers are locked to the deck of the cargo ship or barge as well as one another on each of the four corners. The cargo vessel cranes and hoisting tackle are subject to regular inspections and tests in accordance with Transport Canada Tackle Regulations.

Notwithstanding the preventative measures, which will form part of a Spill Prevention Plan onboard each cargo vessel, the master of the discharging vessel will be responsible for responding to any cargo spills, which may occur while loading barges at lightering positions. A detailed Spill Contingency Plan will be in place onboard each cargo vessel, which will outline remedial actions to initiate in the event of a cargo spill. Every cargo vessel will possess the necessary equipment to

recover lost cargo as well as spill containment supplies in the unlikely event cargo is released from its shipping container. AREVA will ensure that the selected Marine Shipping Company has a Spill Contingency Plan in place for all dry bulk and liquid materials transported and that it links to this Plan and emergency contacts. Furthermore, a contract will be arranged with a spill response organization that has the equipment, personnel and experience to respond to a large spill incident, or where initial recovery efforts fail. In the event of a spill, AREVA and the Shipping Company will conduct an investigation to determine the cause of the spill in order to prevent re-occurrence.

5.2.11 Spill of Radiologically Contaminated Materials

Local residents have expressed several concerns about the potential spill of radioactive material in their community (EN-RI KWB May 2009[13]), on the road between the Kiggavik Site and Baker Lake, or during marine shipping (EN-CI OH Oct 2012 [14]). AREVA does not plan to transport radioactive materials through communities or by barge; the plan for transporting yellowcake is to transport by plane directly from the Kiggavik site. In the event of a spill of any amount of radioactive materials on the Kiggavik site, such as ore or yellowcake, they will be contained and collected into appropriate storage containers (e.g.: drums). The site will be remediated to meet a criterion of less than 1 μSv/h at a height of 1m above background, at a minimum. A spill of any amount of radiologically contaminated materials must be reported.

5.2.12 Spill of Uranium Ore Concentrate while in Transit

ARC has implemented an emergency response assistance plan (ERAP) (AREVA 2013) to respond to incidents involving the transport of uranium ore concentrates along transportation routes within Canada. The ERAP commits ARC to response actions, including the cleanup of UOC spills and the remediation of any area impacted by the material. The ERAP is a comprehensive plan, currently implemented, for AREVA's existing operations which is approved by Transport Canada. In the event

[13] EN-RI KWB May 2009 - *Concerned about the possibility of shipping uranium passed and through communities. Considers the material dangerous and concerned about spills.*

[14] EN-CI OH Oct 2012 - *You were planning to ship yellowcake by barge, and I was very worried about that. But Chester, Baker and Rankin debated this issue, and I suggested it go by barge. Yellowcake is in thick shields, so I wanted barge….. If it would happen with uranium in the ship (emergency) we would have to move. We are very concerned.*

of a transportation incident, an ARC response team will attend the incident and provide equipment and expertise for radiation monitoring. For the air transportation of UOC between the Kiggavik Site and the connection to the road network in northern Saskatchewan, ARC will have emergency response and remediation equipment staged at both the origin and destination terminals in order to respond quickly to an incident. ARC supplements its own commodity-specific expertise by contracting service providers experienced and capable of responding to incidents.

Specific concerns regarding the air transport of uranium ore concentrates have been raised by Athabasca Denesuline communities (EN- ADNT Jan 2014 [15]); **Error! Reference source not found.** is provided to summarize emergency response tactics used by ARC and emergency service providers in responding to incidents involving spills of UOC while in transit.

5.2.13 Spill of Potentially Contaminated/Drill Return Water into a Water Body

In the event of a spill of any amount of potentially contaminated/drill return water into a water body, any activities which are the possible cause will cease until a review of the incident has taken place. Water and sediment samples will be taken and a gamma survey conducted on the affected area. Activities will continue once the General Manager or designate is satisfied with the corrective measures taken.

5.2.14 Spill of Ammonium Nitrate

Ammonium nitrate dissociates readily in water to form ammonia, which in its un-ionized form, is toxic to aquatic organisms and fish. Storage on land, away from water sources largely eliminates the risk of ammonia losses to water bodies.

All partially full contaminated or ripped bags of prill, spilled prill and used empty bags are collected and stored in a dedicated contained location for shipment offsite for disposal. Spills within the storage facility are completely contained. All spills are recorded on a spill report and all tote bags are inspected regularly by the explosives contractor.

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[15] EN - ADNT Jan 2014 - *Letter from Ron Robillard, President of the Athabasca Denesuline Né Land Corp. to Ryan Barry, Nunavut Impact Review Board regarding the transportation of yellowcake.* January 14, 2014; in Appendix 3A: Public Transboundary documentation, Part 10.

A spill of ammonium nitrate on mine roads is highly unlikely; however, accidental spills of ammonium nitrate from an explosives truck will be cleaned up immediately and reported to the mine Operating Supervisor and regulatory agencies, as required. Investigation of the spill site by the ERT in coordination with the explosives contractor and the Environment Group will determine the most appropriate method of cleanup, disposal, and reclamation strategy to minimize effects on the environment. Further information on explosives handling, use, and spill prevention can be found in Technical Appendix 2C-Explosives Management Plan.

5.2.15 Spill of Sewage

Sewage generated from the camp facilities will be treated at the wastewater treatment plant. At remote areas, wastewater will be collected in local holding tanks and transported by tanker truck for treatment at the closest waste water treatment plant. Sewage pipelines will monitored for leaks on a routine basis. Any leaks to sewage pipelines will be repaired in a timely manner.

Spill of sewage will be managed by the Services crew or ERT as required. The sewage would be cleaned up as follows:

- the adequate PPE would be donned including appropriate coveralls, gloves and respirators if necessary;
- Sewage and surrounding soils would be scooped up using equipment or manually with shovels depending on the extent of the spill and diking as required;
- Containment may be required such as temporary barriers to prevent sewage from entering nearby water bodies; and
- Contaminated soils will be transported to the landfarm for disposal.

The Environment personnel will be contacted for:

- initial reporting and documentation of the spill;
- assessment and recommended clean-up procedure depending on the size of the spill;
- provision of specialized equipment if required; and
- any post incident monitoring.

5.2.16 Spill of Incinerator Ash

Spill of incinerator ash will be managed by the Services crew or ERT as required. The incinerator ash would not be expected to be contaminated as protective measures will be implemented to ensure only domestic waste is incinerated.

However, if there ever were a spill of contaminated spill of ash, it would be cleaned up as follows:

- the adequate PPE would be donned including appropriate coveralls, gloves and respirators if necessary;
- the ash would be scooped up using equipment or manually with shovels depending on the extent of the spill and diking as required; and
- containment may be required such as covering with a tarp or lightly spraying with water may be required under windy conditions.

The Environment personnel will be contacted for:

- initial reporting and documentation of the spill;
- assessment and recommended clean-up procedure depending on the size of the spill;
- provision of specialized equipment if required; and
- any post incident monitoring.

5.2.17 Chemical Spills

Chemicals necessary for the processing of ore in the mill will be stored and used onsite. The potential exists for a spill of sulfuric acid, hydrogen peroxide and reagents during transportation and storage onsite. Hazardous chemicals will be transported in appropriate containers and labelled according to TDG guidelines and Transport Canada regulations (Refer to Technical Appendix 2U-Hazardous Materials Plan). All hazardous chemicals onsite will be stored in appropriate storage tanks within covered buildings with a means of secondary containment in the event of spills. Any spilled chemicals will be processed through the mill or contained and transferred to a licensed disposal facility. Table 5.2-1 is listed below to provide guidance on how to respond to a spill of the specified chemical.

There may also be deicing fluid stored and used at the Pointer Lake Airstrip. There will be access to spill response material located at and near the airstrip to respond to a potential spill of deicing fluid, as shown also in Table 5.2-1.

Table 5.2-1 Spill Response Guidelines to Reagents Used at the Kiggavik , Sissons Site and Pointer Lake Airstrip

Reagent	State	Response	Response with Fire	Other Response Considerations
Lime	Solid	• Evacuate personnel, secure and control entrance to the area. • Eliminate all ignition sources. • Dike and prevent entry into waterways. • Use vacuum for large spills.	• Lime does not burn • Use extinguishing media for material that is burning. • Avoid use of water where possible. The heat generated when mixed with water or moist air is sufficient enough to ignite surrounding materials such as paper, wood or cloth.	• Reacts violently with strong acids. Reacts with water to form calcium hydroxide.
Sulfur	Solid	• Evacuate personnel, secure and control entrance to the area. • Eliminate all ignition sources. • Dike and prevent entry into waterways. • Clean up spill by creating as little dust as possible.	• Easily ignitable, combustible solid. • For small fires: o smother by covering with inert material such as dirt and use dry chemical. • For larger fires: o use water spray or steam. Avoid spraying directly into containers due to danger of boil over.	• Incompatible with oxidizing agents, mineral acids and alkalines. • Keep away from heat, spark, flame. • Solid sulfursulfur may release hydrogen sulphide gas. • At higher temperatures, sulfur may react with hydrocarbons and release hydrogen sulphide.

Table 5.2-1 Spill Response Guidelines to Reagents Used at the Kiggavik , Sissons Site and Pointer Lake Airstrip

Reagent	State	Response	Response with Fire	Other Response Considerations
Hydrogen Peroxide (greater than 60%)	Liquid		• Flood with water	• Peroxide itself is noncombustible but decomposition release oxygen and contact with combustibles may cause fires • H2O2 freezing point – 0.4 oC
Sodium Hydroxide	Solid	• Evacuate personnel and secure and control entrance to the area. • Eliminate all ignition sources. • Dike and prevent entry into waterways. • For sodium hydroxide in solution, absorb liquids in dry sand, earth, or a similar material and place into sealed containers for disposal. • Collect solid material in the most convenient and safe manner and place into sealed containers for disposal. • Do not use water or wet method.	• Sodium Hydroxide itself does not burn. • Extinguish fire using an agent suitable for type of surrounding fire. • Poisonous gases are produced in a fire. • Use water spray to keep fire-exposed containers cool. Do not get water inside containers. Sodium Hydroxide in contact with water or moisture may generate enough heat to ignite combustibles.	• Reacts with water or strong acids to generate large quantities of heat. • Reacts with metals to generate explosive hydrogen gas. • Reacts with organic compounds to liberate carbon monoxide gas.
Ferric Sulfate	Solid	• Evacuate personnel and secure and control entrance to the area. • Eliminate all ignition sources. • Dike and prevent entry into waterways. • For small spills: • soak up with absorbent material and scoop into containers. • For large spills: o prevent contamination of waterways. Dike and pump into suitable	• Not flammable, use extinguishing media appropriate for surrounding fire.	• Under fire conditions, toxic, corrosive fumes are emitted. Sulfuric acid could react with metal to produce hydrogen.

Table 5.2-1 Spill Response Guidelines to Reagents Used at the Kiggavik , Sissons Site and Pointer Lake Airstrip

Reagent	State	Response	Response with Fire	Other Response Considerations
		containers. Clean up residual with absorbent material, place in appropriate container and flush with water. Neutralize with lime slurry, limestone, or soda ash.		
Barium Chloride	Solid	• Evacuate personnel and secure and control entrance to the area. • Eliminate all ignition sources. • Dike and prevent entry into waterways. • Avoid raising dust. Scoop up or vacuum up and place in an appropriate closed container.	• Not flammable, use extinguishing media appropriate for surrounding fire.	• Irritating or toxic substances may be emitted upon thermal decomposition toxic if ingested.
Sodium Sulfate	Solid	• Evacuate personnel, secure and control entrance to the area. • Eliminate all ignition sources. • Dike and prevent entry into waterways. • Sweep up or vacuum up spillage and collect in suitable container for disposal. • Avoid dust formation.	• Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.	• Hygroscopic • Avoid Excess heat. • Avoid exposure to moist air or water. • Incompatible with strong oxidizing agent. • Decomposes into sodium oxide.
Flocculant	Solid	• Evacuate personnel, secure and control entrance to the area. • Eliminate all ignition sources. • Dike and prevent entry into waterways. • Do not clean with water. Clean up promptly by scoop or vacuum. Keep in suitable and closed containers for disposal. After cleaning, flush away traces with water.	• Water, water spray, foam, dry powder, carbon dioxide (CO2). • NOTE: extremely slippery when wet. Product is stable.	• Extremely slippery when wet.

Table 5.2-1 Spill Response Guidelines to Reagents Used at the Kiggavik , Sissons Site and Pointer Lake Airstrip

Reagent	State	Response	Response with Fire	Other Response Considerations
Ammonium Nitrate	Solid	• Evacuate personnel, secure and control entrance to the area. • Eliminate all ignition sources. • Dike and prevent entry into waterways. • For small spills: o Vacuum or sweep up material and place into a suitable disposal container. • Avoid generating dusty conditions. • For larger spills: o Stop leak if without risk. • Avoid contact with a combustible material (wood, paper, oil, clothing...). • Keep substance damp using water spray. • Do not touch spilled material.	• Slightly flammable to flammable in presence of heat, of combustible materials, of organic materials. • Oxidizing material. • Do not use water jet. • Use flooding quantities of water. • Avoid contact with organic materials.	• Strong oxidizer • Hygroscopic • Ammonium nitrate is incompatible with strong reducing agents, strong acids, finely powdered metals, organic matter, chlorides, combustible materials. • Can create an explosive hazard when heated under confinement. • Decomposes into oxides of nitrogen.

Table 5.2-1 Spill Response Guidelines to Reagents Used at the Kiggavik , Sissons Site and Pointer Lake Airstrip

Reagent	State	Response	Response with Fire	Other Response Considerations
Sulfuric Acid	Liquid	• Evacuate personnel, secure and control entrance to the area. • Eliminate all ignition sources. • Dike and prevent entry into waterways. • Carefully scoop up and place into appropriate disposal container. -Provide proper ventilation. -Use water sprays to reduce vapours, but do not spray water directly on leaks, spill areas or inside container. • Cover with dry earth, dry sand or other non-combustible material followed with plastic sheet to minimize spreading and contact with water.	• Use extinguishing media most appropriate for the surrounding fire. • Use dry chemical or carbon dioxide for small fires. • For large fires, flood from a distance. Expect a violent reaction. Oxides of sulfur may be produced in fire. • Do not use water directly on fire involving H2SO4.	• NOTE: Sulfuric acid will be produced at the Kiggavik site but transferred in totes to the Sissons site via truck transport. • Reacts vigorously, violently or explosively with many organic and inorganic chemicals and with water. • Avoid excess heat, exposure to moist air or water. Mixing with water will result in heat evolution.

Table 5.2-1 Spill Response Guidelines to Reagents Used at the Kiggavik , Sissons Site and Pointer Lake Airstrip

Reagent	State	Response	Response with Fire	Other Response Considerations
Deicing Fluid (Propylene Glycol)	Liquid	• Contain the spill to prevent contamination of soil, ditches, waterways, or groundwater. • For small spills,absorb the material with materials such as cat litter, sawdust, vermiculite, or Zorball. Collect the material in suitable and properly labeled containers. • Industrial spills or releases are infrequent and generally contained. If a large spill does occur, dike the area to contain the spill. • Isolate the area and evacuate unnecessary personnel. Recover spilled material if possible. Use appropriate safety equipment. Excessive product accumulation on the tarmac during deicing or anti-icing operations should be removed by mechanical means (e.g., vacuum truck).	• Keep people away and deny unnecessary entry. • Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing or fight the fire from a safe distance. Use water fog or fine spray, dry-chemical or carbon-dioxide fire extinguishers, or foam. • Do not use a direct water stream as it may spread the fire.	• Spill Response material will be located at the airstrip for immediate initial response and containment of spilled deicing fluid. • These products are thermally stable at typical storage and use temperatures. Some components of these products can decompose at elevated temperatures, causing pressure build-up in closed systems. • Avoid contact with strong acids, strong bases, and strong oxidizers. • Areas sprayed with these fluids (such as the tarmac) may become slippery.

5.2.18 Wildlife Management during a Spill

Community members raised concerns about protecting wildlife from spills (EN-AR NIRB May 2010[16]). In the event of a chemical spill on ground, affected areas will be remediated and confirmation testing conducted before any wildlife is permitted in the area. Personnel will monitor the area to ensure there is no wildlife interaction with the affected area until cleanup is completed. Spills into water will be managed in a similar manner. Responders will implement measures to control the release of the spill and minimize impact on any fish, wildlife and the surrounding environment. Efforts will be made to limit wildlife access to the affected area during the response and remediation period. Devices such as propane scare cans and helium-filled balloons can be used if necessary to scare away animals, especially birds from the affected area. Precautions taken with respect to polar bears, and all other wildlife, in the case of a spill will be integrated into the Project Management Plan system to best facilitate response planning and actions. All spills will be reported to government agencies and AREVA will work with the agencies to ensure the protective measures are implemented to protect all wildlife.

[16] EN-AR NIRB May 2010: *Concerned over wildlife and the potential impacts from spills. Would like to know if there are any mitigation plans in place for spills and any chemicals that can be used to clean up the environment (minimize the spill).*

6 Landfarm Management Plan

The proposed landfarm for the Kiggavik Project is based on operational experience at AREVA's McClean Lake Operation located in Northern Saskatchewan. The McClean Lake landfarm is an approved facility that operates under a permit from the Saskatchewan Ministry of Environment. Tier 1, Volume 1, Main Document, Section 1.6.2 indicates how the precautionary principle and adaptive management are used to continually monitor and improve operational performance and update mitigation measures. This approach will be applied to landfill and landfarm management throughout the life of the mine to ensure optimal operation of these facilities.

6.1 Landfarming

Landfarming is a bioremediation treatment process for contaminated soils and represents the biological removal process of petroleum hydrocarbons from the soil using microbes, usually in an aerobic process. The contaminated material will likely be placed in windrows and aerated by regular turning using a bulldozer or grader. Due to the long winters and extreme temperatures at Kiggavik, the remediation process will be slow and likely require an extended period of time. Nutrient addition may be required to sustain microbial growth.

6.1.1 Transfer of Contaminated Materials

In the event of a spill, the contaminated soil or ice/snow will be excavated and transported in appropriate containers to the designated landfarm area for treatment. Before commencing any removal of soil, gravel or vegetation, the appropriate regulatory agencies will be contacted as indicated in Attachment A.

6.1.2 Viability

AREVA recognizes that landfarming in an arctic climate presents additional challenges in a bioremediation process; however, bioremediation is increasingly viewed as an appropriate remediation technology for hydrocarbon contaminated polar soils. Experiments conducted in the Arctic indicate that landfarming and biopiles may be useful approaches (Aislabie et al. 2006).

A number of studies in both Arctic and Antarctic regions have shown that microorganisms naturally occurring in harsh environments are capable of degrading petroleum hydrocarbons (Paudyn et al. 2007, McCarthy et al. 2004, Mphegko and Cloete 2004, Ferguson et al. 2003). Studies suggest that landfarming in Polar Regions is effective; however, microbial activity is limited by a combination of unfavourable conditions including low temperature, moisture, and nutrients. Therefore, nutrient addition and aeration of landfarmed soils during the short summer season are key components for effective remediation and are proposed operational considerations for the Kiggavik landfarm.

Recent examples of successful remediation of petroleum hydrocarbon contaminated soils in Arctic regions include the landfarming of diesel contaminated soils at the former military base at Resolution Island, Nunavut (Paudyn et al. 2007) and the successful treatment of 3,600 m^3 of sandy soil by landfarming on site at Barrow, Alaska (McCarthy et al. 2004).

Recognizing that the bioremediation process is slowed by extreme environmental conditions, landfarming of hydrocarbon contaminated soils represents the best option for treatment and reuse of these soils as a result of operations at the Kiggavik Project. Reclaimed soils are proposed to be used as cover material for the industrial landfills, thereby reducing the amount of virgin soils that must be obtained during decommissioning.

6.1.3 Materials Not Amenable to Landfarming

Materials other than soil, such as large rocks or debris, that are hydrocarbon contaminated are not amenable to landfarming and may not be successfully remediated. The landfarm will include storage capacity for stockpiling of these materials within the lined area. These materials will be stored until they can be disposed of within a TMF.

6.1.4 Alternatives

Alternatively, contaminated soils could be stockpiled in a designated area on the mine rock pile for future disposal in a TMF upon decommissioning of the Project. This offers a less intensive solution to managing hydrocarbon contaminated soils but would preclude soil remediation and re-use.

6.2 Leachate and Stormwater Management

The Project landfills and landfarm will be located to take advantage of proposed site features that provide an additional barrier to potential contaminant migration into the surrounding environment, such as constructing these facilities on top of Type 2 mine rock stockpiles. Locating these facilities above grade provides the advantage of minimizing spring freshet and storm water runoff interactions. The designated landfarm area will be bermed on all sides to simultaneously confine all contaminated liquid effluent to the landfarm and divert all uncontaminated runoff around the landfarm. The definitive location of these facilities will be derived during the detailed engineering phase.

The landfarm will include areas for soil reclamation as well as pond areas for contaminated snow/ice storage. Lined ponds will be constructed to receive snow contaminated by accidental fuel and oil spills. Water will be collected from these ponds during summer months and treated at the Kiggavik mill water treatment plant, as required, to remove contaminants. Soil and water monitoring will be conducted to assess hydrocarbon contaminant inventory and this data will be used to analyse and optimize the treatment program.

The landfarm area will incorporate a geomembrane liner in the base to prevent contaminant migration into the mine rock pile. The landfarm area will be surrounded by a containment berm to

direct clean external runoff water away from contaminated materials. The landfarm pad will be graded towards a collection basin to ensure containment of leachate and stormwater. This water will be contained in a lined sump and treated at the mill water treatment plant.

6.3 Air Emissions

The landfarm will be located away from sensitive areas (e.g. camp facilities) to avoid potential air quality issues. Dust suppression techniques may be initiated if conditions warrant it. Air quality monitoring should be unnecessary.

6.4 Soil Sampling

Soil sampling will be conducted on a regular basis to assess hydrocarbon content and to optimize nutrient addition and aeration techniques. Samples will be analyzed at the onsite chemical laboratory and results will be reported to regulatory authorities as part of annual environmental reporting.

6.5 Hazardous Materials

Contaminated soil resulting from the spill of hazardous chemicals will be treated as hazardous waste and shipped to a licensed facility for treatment and disposal. All waste hazardous materials will be stored on a designated storage pad until there is sufficient quantity for shipment. Refer to Technical Appendix 2U – Hazardous Materials Management Plan for details.

6.6 Reclamation of Landfarm

Upon decommissioning of the Kiggavik mine, all remaining contaminated landfarm materials will be sampled to determine contaminant concentrations. These materials along with the underlying liner material will be transferred to a TMF for disposal. Further detail regarding decommissioning of the landfarm will be developed during revision of this plan at the time of Project licensing and permitting as noted in Section 6.7 below.

6.7 Revisions to the Landfarm Management Plan

The final landfarm design will be developed during the detailed engineering and design phase and presented at the licensing and permitting phase. AREVA is committed to providing a comprehensive landfarm management plan that conforms to all applicable regulations and guidelines. Components of this plan will include details on soil treatment layer placement, soil augmentation procedures, soil and water monitoring program, materials inventory management, reporting, and closure.

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Attachment A Agency Contact List

Government Mandatory Reporting Requirements - Contact List	
Nunavut 24-Hour Spill Report Line	Email address – Phone Number
NORDREG	Email address – Phone Number
AANDC-Waters (Iqaluit)	Email address – Phone Number
AANDC -Field Operations	Email address – Phone Number
AANDC – Inspector	Email address – Phone Number
GN-DOE	Email address – Phone Number
DFO-Iqaluit	Email address – Phone Number
EC-Iqaluit	Email address – Phone Number
AANDC Water Resources Inspector	Email address – Phone Number
Aboriginal Affairs & Northern Development Canada (AANDC)	Email address – Phone Number
Canadian Coast Guard Central and Arctic Region	Email address – Phone Number
Transport Canada Marine Safety Central and Arctic	Email address – Phone Number
Kiggavik Mine Manager	Email address – Phone Number
Baker Lake RCMP	Email address – Phone Number
Kivalliq Inuit Association (KIA)	Email address – Phone Number
Nunavut Water Board (NWB)	Email address – Phone Number
Manager, Environmental Protection, Government of Nunavut	Email address – Phone Number
Additional Contact List	
Hamlet of Baker Lake Rep	Email address – Phone Number
Hospital Iqaluit	Email address – Phone Number
Baker Lake Health Centre	Email address – Phone Number
Baker Lake Fire Emergency	Email address – Phone Number
Baker Lake Airport	Email address – Phone Number
Kiavalliq Health Services – Rankin Inlet	Email address – Phone Number
Rankin Inlet Hamlet Office (Senior Admin. Officer)	Email address – Phone Number
Rankin Inlet Fire Emergency	Email address – Phone Number
Contract Spill Response Company	Email address – Phone Number
Agnico Eagle Rep	Email address – Phone Number
Workers Safety and Compensation Commission	Email address – Phone Number

(Contact lists will be completed at time of plan development at Project licensing).

Attachment B 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 EQUIPMENT	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS			

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

PAGE 1 OF _____

Attachment C Current Kiggavik Exploration Site Spill Contingency Plan

Spill Contingency Plan

AREVA Resources Canada Inc.

Exploration Department – Kiggavik Project

REQUIRED USERS

Required and other users are responsible for using the current version of the Spill Contingency Plan as posted on Q:\Exploration\IMS. Users may print copies of this plan, but are ultimately responsible for ensuring they are using a current copy as posted. Users are requested to destroy all previously printed copies of the plan when they are informed of revisions.

HISTORY OF REVISIONS

Version	Revision	Date	Details of Revision
1	0	March 2007	Original submission
2	0	October 2007	Update to reflect changes in field activities/capabilities and goals of continual improvement
2	1	May 2008	Updated to reflect comments and conditions received by the Nunavut Water Board associated with the issuance of water licence no. 2BE-KIG0812
3	0	January 2009	Update to reflect changes in field activities/capabilities and goals of continual improvement
4	0	March 2009	Updated to reflect changes in field activities/capabilities and goals of continual improvement
5	0	January 2010	Updated to reflect changes in field activities/capabilities and goals of continual improvement
6	0	May 2011	Updated to reflect personnel titles, grammatical changes, reorganized information and clarified responsibilities. Made consistent with other Plans and Manual and updated to reflect changes in fuel storage and equipment.
7		May 2012	Updated to reflect personnel changes, grammatical changes, reorganized information and clarified responsibilities. Made consistent with other Plans.
7	1	May 2013	Updated to reflect personnel changes, and correction of grammatical errors.
7	2	May 2014	Updated infrastructure list, surface land administration, and proximity to water mark

Original Copy of this Manual:

Approved and Signed by: **Naomi Stumborg**

Safety Health Environment and Quality Supervisor, Exploration

Approved by:
Signature and Date

Approved and Signed by: **Patrick Ledru**

Vice President, Exploration

Approved by:
Signature and Date

The original hard copy of this approval page has been signed and is located at the AREVA Resources Canada Inc. Exploration central records.

AREVA

TABLE OF CONTENTS

1 INTRODUCTION 1-1

1.1 PURPOSE AND SCOPE 1-1

1.2 REVISION TO PLAN 1-1

1.3 RESPONSIBILITIES 1-2

2 SITE INFORMATION 2-1

2.1 LOCATION 2-1

2.2 PETROLEUM AND CHEMICAL PRODUCT STORAGE AND INVENTORY 2-2

2.3 PETROLEUM PRODUCT TRANSFER 2-5

2.4 LOCATION AND CONTENT OF SPILL KITS 2-5

2.5 ORIENTATION 2-7

3 POTENTIAL HAZARDS, MITIGATION AND PREVENTATIVE MEASURES 3-1

3.1 POTENTIAL HAZARDS 3-1

3.2 MITIGATION AND PREVENTATIVE MEASURES 3-1

4 SPILL RESPONSE 4-1

4.1 RESPONSE TO A SPILL – CONTAINMENT AND CLEAN-UP 4-1

4.2 EXAMPLES OF SPILL SCENARIOS 4-3

5 SPILL REPORTING REQUIREMENTS 5-1

5.1 SPILL RESPONSE CONTACT LIST 5-3

5.2 REPORTING REQUIREMENTS 5-3

6 TRAINING AND PRACTICE DRILLS 6-1

7 REFERENCES 7-1

LIST OF TABLES

Table 2-1 Petroleum and Chemical Storage 2-2
Table 4-1 Spill Response Supplies..... 4-3

LIST OF FIGURES

Figure 2.1 Kiggavik Fuel Cache 2-3
Figure 2.2 Insta-berm 2-4
Figure 2.3 Example of Spill Kits available at Project site 2-6

LIST OF APPENDICES

APPENDIX I EXPLORATION EMERGENCY CONTACTS 7-3

APPENDIX II SPILL REPORT FORM..... 7-4

APPENDIX III MAPS 7-5

1 INTRODUCTION

This Spill Contingency Plan (Plan) applies to the Kiggavik Project located approximately 80 km west of Baker Lake, Nunavut and all points located between the site and Baker Lake. In addition, the Plan is made available at the Kiggavik Site, AREVA Resources Canada Inc (ARC) Baker Lake Office as well as ARC's exploration office.

1.1 PURPOSE AND SCOPE

The primary objective of the Plan is to help prevent or reduce the potential of spills of pollutants and prevent, reduce or eliminate any adverse effects that may result. As such, the Plan provides information and guidance on actions important for the prevention of spills and procedures to detect and respond to spills if they occur.

The Plan will evoke a risk management approach when considering potential spill events. Effective implementation of spill prevention planning is also an important proactive component for minimizing the risks posed by spills. By implementing effective spill prevention, the risk of spills can be reduced in magnitude and perhaps avoided.

Furthermore, the purpose of this plan is to identify safe, effective and efficient response methods to spills in the vicinity of ARC's operations in Nunavut. This Plan is intended to satisfy Nunavut R-068-93 *Spill Contingency Planning and Reporting Regulations*. In said regulations, "spill" is defined as "…a discharge of a contaminant in contravention of the Act or regulations made under the Act or a permit or license issued under the Act or regulations made under the Act." ARC's working definition of a spill is defined as any accidental discharge to the environment of a hazardous material.

1.2 REVISION TO PLAN

The Plan is reviewed on an annual basis and is updated as required to keep the information current and consistent with regulatory and procedural changes. A History of Revisions can be found at the front of this document.

1.3 RESPONSIBILITIES

The District Geologist, Nunavut is responsible to ensure that this plan is implemented. Implementation may be completed by:

- Project Geologist
- Facility Supervisor
- Safety Health Environment and Quality (SHEQ) Supervisor
- Or designates

The Vice President, Exploration is ultimately responsible for any activity being carried out by Kiggavik Project personnel.

2 SITE INFORMATION

2.1 LOCATION

The Kiggavik Project includes two sites, collectively composed of 37 mineral leases covering 45,638.5 acres located in the Kivalliq Region of Nunavut:

- The Kiggavik site is located at approximately 64°26'N and 97°37'W. The property consists of 15 mineral leases totaling 3,753 hectares (ha) (officially 9,267 acres).

- The Sissons site is situated roughly 17 km south-west of Kiggavik at approximately 64°20'N and 97°52'W. The Sissons site consists of 22 mineral leases totaling 14,730 ha (officially 36,372 acres).

The surface rights for 31 mineral leases on Inuit Owned Land (IOL) are administered by the Kivalliq Inuit Association (KIA) while the remaining six mineral leases remain on Crown land. The Crown land covers 3,794 acres of the Jane prospect of the south-west portion of the Project with surface rights administered by Aboriginal Affairs and Northern Development Canada (AANDC).

There is an existing temporary exploration camp at the Kiggavik site which can accommodate approximately 60 people. The Kiggavik camp is located at the following coordinates:

- UTM 14W 564530 E 7146879 N
    - Latitude: 64° 26' 29'' N
    - Longitude: 97° 39' 34'' W

In 2007, the temporary camp accommodated approximately 32 persons, was expanded to accommodate approximately 50 persons in 2008 and 60 in 2009. Further camp expansions and personnel requirements will be discussed in permit applications for the field season. Detailed site maps showing topography can be found in Appendix III. The camp currently consists of the following:

- One storage shed/back-up generator/shop
- One generator building (housing current generator)
- Helicopter storage/shop
- Three helicopter pads

- One washroom/dry building constructed with separate male/female facilities
- One kitchen with storage
- One wooden office
- 15 wooden sleeping units (one is a first aid shack)
- Wooden boardwalk throughout camp
- Five prospector tents (core logging tents)
- Three weather havens (2 for sleeping units, 1 for office)
- One mechanical services room
- Grey water collection area
- Industrial incinerator
- Core storage
- Radioactive materials storage compound
- Eight bulk fuel storage tanks (50,000 L capacity per tank)

There is a fuel esker containing one shed and eight bulk fuel tanks. Three bulk tanks are for Jet-B fuel and five are for diesel fuel, and additional fuel drums within secondary containment may also be stored at the esker.

Currently there is one shed and core storage located at the Andrew Lake drill site, as well as core storage at the Kiggavik site and Pointer Lake.

2.2 PETROLEUM AND CHEMICAL PRODUCT STORAGE AND INVENTORY

The table below provides a list of products used, along with the maximum amount stored and type of storage. A specific inventory of all petroleum and chemical products used during the field operations is recorded at site.

Table 2-1 Petroleum and Chemical Storage

Chemical/Material	Amount	Storage Type
Diesel Fuel	250,000 L	EnviroTanks
Jet B Fuel	150,000 L	EnviroTanks
Gasoline	1,025 L	Secondary Containment
Generator Oil	20 x 20L (400 L)	Secondary Containment
Hydraulic Oil	20 x 20L (400 L)	Secondary Containment
Engine Oil	20 x 20L (400 L)	Secondary Containment
Propane	75 x 100 lb (7500 lb)	Secondary Containment
Grease (for grease gun)	5 cases x 12 tubes (60 tubes)	Secondary Containment
Salt	50,000 lbs	Secondary Containment
Cement	15,000 lbs	Secondary Containment

2.2.1 Fuel Storage

To accommodate increased fuel demand and reduce the potential of fuel spills, bulk fuel storage tanks were installed. The eight double-walled steel EnviroTanks, each with a capacity of 50,000 L were installed at the esker located on the Kiggavik lease, west of the Kiggavik camp. Three tanks on the north side of the esker are for the storage of Jet-B fuel, and five tanks on the south side of the esker are for the storage of diesel fuel as shown in Figure 2.1. The coordinates for the fuel cache are 14W 561512 7145240.

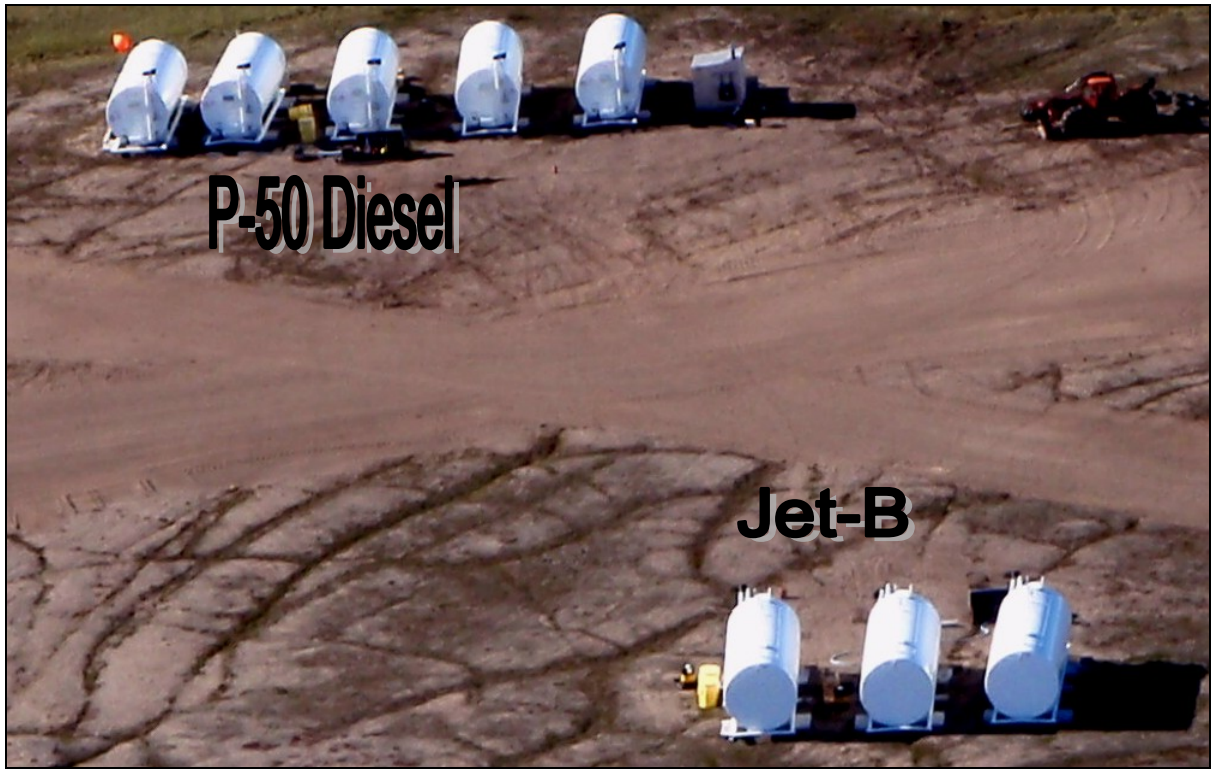

Figure 2.1 Kiggavik Fuel Cache

The site layout and tanks have been designed by a consulting professional engineer and have been installed by a registered company/petroleum contractor to ensure compliance with the Canadian Council of Ministers of the Environment (CCME) Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products, 2003. In 2007 Golder Associates (Golder) conducted an engineering assessment to identify potential issues with the installation of storage tanks. Recommendations were provided for the foundation support for the storage tanks. To mitigate the potential issues described in the report, Golder recommended that the tanks be placed on timbers located under each saddle to provide an increased bearing area. The use of timbers is a deviation from the CCME COP, however it should be noted that this is common practice in the area and AREVA received permission from the area Fire Marshal, Tim Hinds with the Government of Nunavut-Community and Government Services via email (Trevor Carlson to AREVA, November 20, 2007).

The design basis, operation and maintenance requirements for all petroleum storage and handling on site are based on the CCME Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products, 2003 and in compliance with the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*, under the *Canadian Environmental Protection Act, 1999* (CEPA 1999). The fuel storage system at the Kiggavik site has been registered with Environment Canada (EC) through an online database, the Federal Identification Registry for Storage Tank Systems (FIRSTS).

Double walled steel EnviroTanks and associated pump meet the requirements of secondary containment within their own structure. For further secondary containment, rubberized berms (Arctic berms) or other suitable lined structures are utilized during fuel transfers to minimize the potential for fuel spills where possible. Absorbent padding is used during fueling to control dripping fuel. Further protection against spills is provided by high level alarms, overfill preventers, and catch basins around each fill pipe.

The fuel is transported to the Kiggavik site fuel cache during the winter via ground transport using snow cats, foremosts or other tundra trucks. The fuel is transported using 10,000 L fuel bladders containing Jet-B or P-50 diesel fuel, and is transferred from the fuel bladders to the EnviroTanks located at the fuel cache. Unleaded gasoline and propane cylinders may be brought to the Kiggavik site during the winter haul or by aircraft from Baker Lake.

Diesel fuel is transferred from the EnviroTanks double-walled fuel tanks for use in camp and/or drill sites. There is also a fuel cache located at the Kiggavik Camp (14W 564464, 7146782). This fuel cache includes double walled fuel tanks used to supply the generators. All fuel containers are labelled, identifying the contents and the name “AREVA”. Should fuel drums be used, the 205 L drums are stored within secondary containment. Secondary containment is used for all liquid fuels, and lubricants, and drill additives are stored in sea containers to avoid adverse weather conditions. All secondary containment systems being used are capable of containing 110% of the total aggregate storage capacity. The following photo shows secondary containment used for the storage of petroleum products and other hazardous materials and hazardous waste products. The Insta-Berm made of industrial-strength fabrics, is a durable and easy-to-use environmental safeguard.

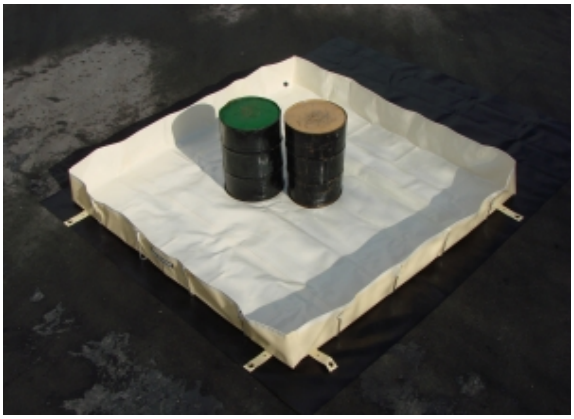

Figure 2.2 Insta-berm

Absorbent matting and/or drip pans must be placed under all areas where fuel leaks are likely to occur (e.g., fuel line hose connections, fuelling stations, generators, water pump), and these areas must be inspected on a daily basis where possible.

Waste oil, waste filters, and cleaned-up spill materials are contained in ring top barrels within secondary containment. Degreasing agents used for maintenance of equipment parts and grease are also contained in ring top barrels within secondary containment. These hazardous wastes are stored in the storage shed during the season, and later transferred to a sea container until they are removed from site during the winter haul. The materials are then disposed of at an approved facility.

2.3 PETROLEUM PRODUCT TRANSFER

To minimize fuel spillage associated with dispensing of product, all dispensing and tank filling operations are attended and involve the use of manually controlled nozzles equipped with automatic shut off mechanisms. Smoking, sparks or open flames are prohibited in fuel storage and fuelling areas at all times. Petroleum transfer operations will be carried out by trained personnel.

2.4 LOCATION AND CONTENT OF SPILL KITS

Spill kits can vary in size and content depending on supplier and manufacturer however to remain consistent and provide adequate spill supplies, ARC has chosen two types of spill kits which are considered to be standard. The kits generally include the following contents, or similar products:

1. Universal Emergency Response Kit 30Gallon/135L
    - Sorbant capacity of 96L
    - 4 socks (3” X 10’)
    - 75 pads
    - 1 drain cover
    - 1 caution tape
    - 2 pairs nitrile gloves
    - 2 pairs safety goggles
    - 2 protective coveralls
    - 5 disposable bags
    - 1 instruction book
2. Universal Overpack Kits 95 US Gallon Drums
    - Sorbant capacity of 275L
    - 4 socks (3” x 10’)
    - 5 socks (3” x 4’)

- 50 pads
- 5 pillows
- 1 roll
- 1 drain cover
- 1 caution tape
- 2 pairs nitrile gloves
- 2 pairs safety goggles
- 2 protective coveralls
- 10 disposable bags
- 1 instruction book

A variety of spill kits are available, other kits than those listed above may be purchased for a variety of reasons (availability, intended use, etc). All spill kits contain an itemized list of its contents and an inventory is conducted at the beginning of each field season and immediately following use to identify and replenish missing items.

Figure 2.3 Example of Spill Kits available at Project site

In addition, the following spill response material is also readily available in the generator building for spill response:

- Plugging compound
- Bulk supplies of oil absorbent pads and socks
- Aluminium or brass shovels or tools
- Bonding cables

Due to the volume of fuel being stored in the fuel tank storage system and the remote nature of the sites, at least one of the Bulk Storage Site Spill Kits 95 US Gallon Spill Kits will be present for each 100,000L of fuel being stored.

In addition:

- At least one empty fuel drum and a pump will be located at each fuel cache and tank storage system in the event of damaged or leaking drums.
- Fire extinguishers of the proper type, size and number will be stationed in each building, at the fuel tank storage system and near each site where equipment is normally serviced and anywhere else it is deemed advisable.
- A supply of sealable 20-litre steel pails or 205-litre drums will be reserved for the collection and storage of used absorbent materials. Steel drums, clearly labelled for the storage of spent absorbent materials will be located at camp and at each fuel storage tank location as well as at each cache of drummed fuel or lubricants.

2.5 ORIENTATION

All personnel at camp (ARC employees, contractors, and long term visitors) are given formal orientation upon arrival at camp. The Spill Contingency Plan is reviewed during orientation which and includes the location of the Material Safety Data Sheets, location of spill kits and additional supplies or tools. Training for spill contingency consists of alerting all personnel to be watchful for any leaks or spills and where these are most likely to occur, instruction in the use of the equipment and materials, introduction to the protocol of the chain of command and the legal requirement to report certain spills, and how to collect, store and dispose of spilled product.

3 POTENTIAL HAZARDS, MITIGATION AND PREVENTATIVE MEASURES

3.1 POTENTIAL HAZARDS

Potential sources for spills have been identified as follows:

- Stored drums of P-50 diesel, gasoline, waste fuel, and waste oil may leak or rupture
- Overfilling of tank(s) at the fuel tank storage system of Jet-B or P-50 diesel
- Transfer of fuel between EnviroTanks, drums and fuel bladders
- Transportation of fuel during winter haul
- Fire at the fuel tank storage system
- Collision at the fuel tank storage system
- Vandalism of fuel tank storage system
- Propane cylinders: propane leaks may occur at the valves
- Refuelling equipment such as diamond drill equipment, helicopters, camp generator, stoves, incinerator, wheeled vehicles, snowmobiles and pumps. Incidents involving leaking or dripping fuels and oils may occur due to malfunctions, impact damage, lack of regular maintenance, improper storage, or faulty operation
- Damaged lead/acid batteries causing spills of acid
- Improper drilling or transport of cuttings bags causing a spill of radiologically contaminated drill cuttings and drill return water.

3.2 MITIGATION AND PREVENTATIVE MEASURES

The Environmental Code of Practice discusses how to conduct activities so as to minimize the risk of spills. In addition, the following measures will further minimize the potential for spills during fuel handling, transfer and storage:

- Fuel transfer hoses with cam lock mechanisms to be used when transferring bulk fuel deliveries into the bulk storage tanks.
- Carefully monitor fuel content in the receiving vessel during transfer. Always have additional absorbent pads on hand while transferring fuel.
- Clean up drips and minor spills immediately.
- Regularly inspect drums, tanks and hoses for leaks or potential to leak and for proper storage.
- Create fuel caches that are located at least 31 m from the normal high-water mark of any water body.
- Inventory and reconciliation procedures developed to ensure tanks are not overtopped and to ensure that tank leakage is not occurring.
- Overfill protection on tanks include visual and audible alarms; catch basins around fill pipe; additional secondary containment at transfer locations; corrosion protection.