



**AEM**

**OPERATING AND MAINTENANCE MANUAL**  
**AGNICO-EAGLE MEADOWBANK PROJECT**  
**BAKER LAKE FACILITIES**

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Revision 0  
October 19, 2007

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## **1. INTRODUCTION**

The Meadowbank Gold Project is located on Inuit-owned land in the Kivalliq Region of Nunavut, approximately 70 km north of Baker Lake (see Figure 1). The gold will be extracted during the roughly eight- to ten-year operational lifespan of the mine. All construction and operating supplies for the project will be transported on ocean freight systems to facilities constructed in the Hamlet of Baker Lake, which will include barge unloading facilities, laydown area, and fuel tank storage area. The present Operating and Maintenance Manual is for the operation of these facilities.

### **1.1 PURPOSE & SCOPE OF THE OPERATING AND MAINTENANCE MANUAL**

The purpose of the Meadowbank Baker Lake Facilities Operating and Maintenance Manual is to ensure that these facilities are operated, maintained and monitored in accordance with standardized preventive practices. It also provides an all inclusive guide for the operators of the facilities and will be used to train personnel in the environmentally responsible operation of the facility.

More specifically the objectives of this Operating and Maintenance Manual are to:

- ensure that a due diligence philosophy is used in the operation of the facilities;
- ensure that measures are in place in the event of a spill to prevent environmental contamination;
- ensure that water is managed with an objective to minimise any potential impacts on the aquatic ecosystem of the adjacent Baker Lake.

The present manual has been written in the spirit of an adaptive management philosophy and will be updated throughout the life of the facility to reflect operational experience and a continuous improvement objective.

### **1.2 CORPORATE STRUCTURE**

In early July 2007, Cumberland Resources became a 100% wholly-owned subsidiary of Agnico-Eagle Mines Limited (AEM). Through a series of steps, AEM amalgamated with Cumberland and Meadowbank Mining Corporation (a wholly-owned subsidiary of Cumberland) on August 1, 2007. As a result of this amalgamation, all of the rights, title, interests, liabilities and obligations of Cumberland and AEM are automatically, by law, transferred to and assumed by AEM. Therefore in all the Water License documents, the terms 'Cumberland', 'Meadowbank', 'AEM' and 'AEM' are to mean the same entity: 'Agnico-Eagle Mines Limited.

Agnico-Eagle Mines (AEM) Limited has its head office in Toronto at the following address:

Agnico-Eagle Mines Limited

145 King Street East, Suite 400  
Toronto, Ontario,  
M5C 2Y7  
Tel: 416-947-1212  
Website: [www.agnico-eagle.com](http://www.agnico-eagle.com)

The Meadowbank project is managed out of the Vancouver office at the following address:

Agnico-Eagle Mines Limited  
Suite 375, 555 Burrard Street, Box 209  
Two Bentall Centre  
Vancouver British Columbia, V7X 1M8  
Tel: 604-608-2557

The Baker Lake Facilities will be managed out of the Baker Lake office at the following address:

Agnico-Eagle Mines Limited  
Baker Lake, Nunavut,  
X0C 0A0  
Tel: 867-793-4610

### **1.3 ENVIRONMENTAL POLICY**

The present manual has been prepared in accordance with the commitments made in Agnico-Eagle's environmental policy, which are to:

- Assess the potential environmental impacts of any new undertaking with an objective to minimise them.
- Design and operate our facilities to ensure that effective controls are in place to minimise risks to health, safety and the environment.
- Implement an emergency response plan to minimise the impacts of unforeseen events.
- Provide a professional environmental staff to plan and direct environmental compliance programs and to assist in training and education activities.
- Provide training and resources to develop environmentally responsible employees.
- Ensure that environmental factors are included in the purchase of equipment and materials.
- Ensure that contractors operate according to our environmental policy and procedures.
- Comply with all applicable environmental laws and regulations.
- Communicate with employees, the public, government agencies and other stakeholders on activities involving health, safety and the environment.
- Regularly verify environmental performance and implement any required corrective action.

- Minimise the generation of hazardous and non-hazardous waste and ensure proper disposal of all wastes.
- Implement measures to conserve natural resources such as energy and water.
- Rehabilitate sites in accordance with regulatory criteria and within the established time-frame.

## **2. FACILITIES DESCRIPTION**

The proposed facilities at Baker Lake are located about 2 km east of the community and have the following coordinates (see Figure 1):

- Latitude: 64°19'2.42"N                      Longitude: 96° 1'13.37"O
- UTM coordinates 644 025 E, 7 135 770 N

The facility will consist of a barge unloading ramp with an adjacent storage and marshalling area, a fuel storage facility, a storage compound for explosives (all explosives will be stored in approved magazines) and interconnecting roads. A total storage area of approximately 104,000 m<sup>2</sup> will be provided by this facility, near the community of Baker Lake. The entire facility will be fenced and include an office trailer. Power for the facility will be supplied by portable generators and yard lighting will be provided by portable, diesel powered light towers.

The Meadowbank Baker Lake facilities are shown in Appendix A.

### Marshalling Area

The marshalling area will be used for interim storage of supplies for construction and operations of the Meadowbank Project. The marshalling facility will receive supplies during the shipping season from late July until early October. The supplies will then be consolidated, sorted and transported to the site. The site for the laydown area slopes up at about a 10% grade and is located at least 200 metres from the lake shore. It will a terraced gravel based storage area for stacking sea containers and other equipment. The containers will be stacked two high. An appropriate container handler will be utilized to handle containers from the barge landing site and for transportation related loading. A separate area will be lined with an HDPE liner for the storage of Ammonium Nitrate (AN). This storage area will encompass approximately 6,600 m<sup>2</sup>, and will be located on the northwest side of the laydown area. The general laydown area will cover approximately 65,000 m<sup>2</sup>.

**FIGURE 1**  
Map of Nunavut showing the location of Baker Lake and of the Meadowbank Project



## Tank Farm

The fuel tank farm will consist of four 10 ML diesel fuel storage tanks, two of which to be installed in 2007. The fuel tank farm will be located adjacent to the marshalling area, approximately 300 metres from the shore of Baker Lake. These tanks will be field-erected steel tanks built to API-650 standards and located within a lined and bermed containment area, capable of containing 110% of the total volume of the tanks.

The barges transporting diesel fuel to Baker Lake will be equipped with onboard transfer pumps to transfer fuel through a 200 mm hose connection to the storage tanks. A fuel pump module will be installed adjacent to the fuel storage tanks. The module will have high and low volumedispensing pumps to allow re-fuelling of highway vehicles, and the filling tanker trucks which will be used to haul fuel to site. The module will be housed in an arctic container installed on a lined and compacted gravel pad. The pump module will be provided with a spill collection sump and pumpout facilities.

The fuel storage facility will be contained within a lined and bermed area complete with the following:

- A granular base for the tank complete with a 60 mil HDPE liner system and granular dikes to suit the 2 - 10ML tanks
- Two 10ML tanks complete with the required appurtenances such as stairs, base manholes,water draw offs, re-supply nozzle, suction nozzle, tank lighting, tank level monitoring, roof manhole, manual gauge hatch, tank temperature and P/V Vent
- Piping for unloading and loading
- Site lighting via fixtures mounted from the dispensing building
- One Re-supply/Dispenser Building for loading the fuel Trailer / Truck and other vehicles.

The fuel truck loading rates will be up to 50 m3/hr (15HP). Fuel loading rates will be up to 3 m3/hr (1.5HP) for small vehicles. This facility will be complete with temperature compensated metering system to manage fuel flows, safety valve to prevent loss of fuel from the fuel facility, fire extinguishers, building heating and ventilation systems, building lighting systems and controls systems for the pumps.

A fuel dispensing pad area complete with a dispensing unit will be in a lined facility with a provision to capture any and all spills at the fuelling area and direct it to the main containment area provided for the 2 - 10ML tanks.

The facility is designed to meet the following standards:

- As a general guideline the fuel facility will meet the GN standard “Design Rationale for Fuel Storage & Distribution Facilities 1998”.
- National Fire Code 1995
- Proposed Federal Petroleum Products and Allied Petroleum Products Storage Tank System Regulations – 2003
- Canadian Council of Ministers of the Environment “Environmental Code of Practice of Aboveground Storage Tank Systems Containing Petroleum Products – 1994”

At present, there are no plans to use water for hydrostatic testing of the integrity of the fuel tanks once they are erected. As with the 5 million litre tank that was previously permitted for the Meadowbank site, alternate testing methods will be used. These alternate methods of testing include: vacuum testing of the tank floor, shell to floor welds tested by penetrating oils, such as diesel and x-raying of welds to the extent required by API 650. These alternate testing methods have been successfully deployed at Diavik and Snap Lake Mines. Hydrostatic testing in cold weather is generally avoided because of potential icing after the testing is completed.

#### Explosive Storage Compound

The explosives storage compound is located still farther up the slope, at a distance as required by explosive storage regulations.

#### Roads

The roads will have an 8% gradient and will be covered with compacted granular fill.

#### Drainage Control

Ditches will control run-off from roads and storage platform. The contact run-off will be directed to an impervious sedimentation pond adjacent to the unloading platform. Water management is covered in the Water Management Plan included in Appendix B.

### **3. HAZARDOUS MATERIALS STORED ON SITE**

The tank farm will be used to store up to 40 million litres of diesel fuel for the construction, operation and all other activities at the Meadowbank project.

The marshalling area will be used as temporary storage for all the material that will be shipped by barges to Baker Lake for the construction and operation of the Meadowbank project. The list of hazardous material that will transit through the marshalling area is the same as the list of hazardous material that will be used at the Meadowbank site and is reproduced in Table 3-1 from the Meadowbank License A application documents (Golder Report No. 457 – Hazardous Material Management Plan, August 24, 2007 and Golder Report No. 483 Spill Contingency Plan, August 27, 2007)

**Table 1**  
**Consumable Chemical Materials that would transit through the Baker Lake Facilities**

<b>Large quantities required annually</b>	<b>Relatively small quantities required annually</b>
<p>Diesel, hydraulic, lube, oils and greases</p> <p>Gasoline and Jet B aviation fuel</p> <p>Ethylene glycol</p> <p>Ammonium nitrate</p> <p>Ammonium nitrate fuel oil (ANFO)</p> <p>explosive</p> <p>Hydrated lime</p> <p>Percol flocculent</p> <p>Acetylene</p> <p>Ferric sulphate or ferric chloride</p> <p>Dynamite and packaged emulsion explosives</p> <p>Emulsifiers (N7, N16, N23) for bulk emulsion explosives</p> <p>Sodium nitrate</p> <p>Glass beads for bulk emulsion explosives</p> <p>Bulk emulsion boosters</p> <p>Perimeter explosives</p> <p>Paints</p> <p>Solvents (varsol)</p> <p>Batteries</p> <p>Quicklime</p> <p>Food products</p> <p>High explosives detonators and blasting caps</p> <p>Activated carbon (granular)</p> <p>Anti-scalant</p> <p>Sodium cyanide</p> <p>Sodium hydroxide</p> <p>Hydrochloric acid</p> <p>Sulphur</p> <p>Silica</p> <p>Sodium metabisulphite</p> <p>Copper sulphate</p> <p>Borax</p> <p>Shop supplies (batteries, hardware, fasteners, solvents, machining lubricants, etc.)</p> <p>Surface and underground drilling consumables</p>	<p>Hydrofluoric acid</p> <p>Nitric acid</p> <p>Carbon dioxide*</p> <p>Hydrogen peroxide or calcium peroxide*</p> <p>Sulphuric acid*</p> <p>Camp maintenance products (detergents, cleaning fluids and powders, light bulbs, etc.)</p> <p>Office supplies</p> <p>Laboratory chemicals</p>

## **4. FACILITIES OPERATION AND MAINTENANCE**

The main components of the facilities operation, in place to ensure environmental protection, are as follows:

- Site security
- Product Identification
- Inventory Control
- Water Management
- Testing and Inspection Program
- Preventive Maintenance Program
- Material Handling and Transfer
- Spill Contingency Plan

### **4.1. SITE SECURITY**

Access to the site of the Tank Farm, the Explosive Storage facility and the Marshalling Area will be restricted to authorised personnel which have received the appropriate training. The facilities will be fenced and a surveillance camera installed for monitoring.

Signs will be posted to indicate that access is restricted.

### **4.2. PRODUCT IDENTIFICATION**

All containers stored at the Marshalling area should be identified with the product information found on the Material Safety Data Sheets.

The fuel tank at the tank farm should be identified with the product they contain, the tank capacity and the year of construction.

All products stored at the Explosive Storage Facility should have proper identification and signs should be posted as specified in the regulations.

### **4.3. INVENTORY CONTROL**

An inventory control system will be in place at the Tank Farm, the Explosive Storage Facility and at the Marshalling area to ensure that all material and fuel is accounted for. This system will include inventory reconciliation with a provision for reporting to management of discrepancies in inventories.

### **4.4. WATER MANAGEMENT**

A water use and management plan was prepared for the facility and it is included in Appendix B.

### **4.5. TESTING AND INSPECTION PROGRAM**

#### **Tank Farm**

The fuel storage tank system will be tested prior to the tank being placed in service and whenever a leak is suspected in the primary or secondary containment of the storage tanks, piping, containment sumps or related components. Inventory control will also be used as a leak detection tool.

The following inspections of the fuel tank systems will be carried out:

- Routine daily visual inspection of the storage tank facility to ensure that there has not been a leak or deterioration of the facility that could result in a leak, will be conducted and documented in a log book.
- Routine weekly inspection of the storage tank facility will be conducted and documented in an inspection form. These inspections will look at:
  - (a) foundations, tank walls, roof, and tank attachments;
  - (b) dyke capacity, condition of the dyke wall and floor, and water removal systems;
  - (c) pumps and product-handling equipment;
  - (d) tank gauging equipment;
  - (e) mechanical and automatic electronic leak detection equipment;
  - (f) dispenser sumps and spill containment devices; and
  - (g) overfill protection devices.
- Annual inspection and performance testing will be conducted on the storage tank facility and documented by an external authorised inspector.

Any deficiencies in a storage tank system identified as a result of the above inspections specified will be documented and reported to management who will promptly correct it.

## **Marshalling Area**

The storage containers should be inspected for damage upon reception and prior to storage. Any damaged container that could lead to a contaminant spill should be set aside and provide with secondary containment or repaired if possible. The storage will be organised to prevent storage of incompatible products side by side.

In addition to inventory control inspection, the following inspections of the marshalling area will be carried out:

- Routine daily visual inspection of the storage area to ensure that the containers storage is physically stable, the inspection will be recorded in a log book;
- Monthly inspection of the storage facility will be conducted and documented in an inspection form. These inspections will look at:
  - (a) marshalling area foundations, roof, and walls;
  - (b) sump capacity, condition of the dyke wall and floor, and water removal systems;
  - (c) product-handling equipment;
  - (d) signs of spilled material; and
  - (d) spill containment devices (ex: is the spill kit complete)

Any deficiencies in a storage tank system identified as a result of the above inspections specified will be documented and reported to management who will promptly correct it.

## **Explosive Storage Area**

The storage containers should be inspected for damage upon reception and prior to storage. Any damaged container will be supplied with secondary containment or repaired.

In addition to inventory control inspections, the following inspections will take place:

- Routine daily visual inspection of the storage area to ensure that the explosive storage is physically stable, and done according to standard practices, the inspection will be recorded in a log book.
- Monthly inspection of the storage facility will be conducted and documented in an inspection form. These inspections will look at:
  - (a) building or container foundations, roof, and walls (for deterioration);
  - (b) signs of spilled material; and
  - (c) spill containment devices (ex: is the spill kit complete)

Any deficiencies in a storage tank system identified as a result of the above inspections specified will be documented and reported to management who will promptly correct it.

## **4.6. PREVENTIVE MAINTENANCE PROGRAM**

In addition to maintenance resulting from inspection, the main components of the facilities will be placed on a preventive maintenance program which will ensure that components will

be inspected and replaced before failure. The program will be managed with the J.D. Edwards maintenance program in use at all Agnico-Eagle facilities.

## **4.7. MATERIAL HANDLING AND TRANSFER**

### **Fuel Tank**

The personnel responsible for transferring fuel will have received training to ensure that all reasonable steps will be taken to prevent spills, such as:

- (1) When a tank vehicle is being unloaded, the vehicle *operator* shall remain:
  - (a) in constant view of the fill pipe; and
  - (b) in constant attendance at the delivery control valve. (See Appendix B, note
- (2) Standard procedures for normal operation, as well as for emergencies, shall be posted in printed form for convenient reference.

### **Marshalling Area**

The personnel responsible for unloading barges into the marshalling area and for loading trucks for transportation to the Meadowbank project will have received training to ensure that all reasonable steps will be taken to prevent spills, such as:

- (1) Ensure that the lifting capacity of the lifting device matches the load to be carried;
- (2) Ensure that the containers are transported to the specified areas of the marshalling area (incompatible materials should not be placed side-by-side);
- (3) Ensure that container stacking leads to a physically stable storage.
- (4) Emergency and spill procedures will be posted in printed form for convenient reference.

The Material Safety Data Sheets of the stored products should be kept in the storage area

### **Explosive Storage Area**

The personnel responsible for transferring explosive material will need to be certified and as part of their training they will receive instructions to ensure that all reasonable steps will be taken to prevent spills. Training will be done according to the applicable explosives regulations (Explosives Regulations, R.R.N.W.T. 1990 c. E-27). Emergency and spill procedures will be posted in printed form for convenient reference.

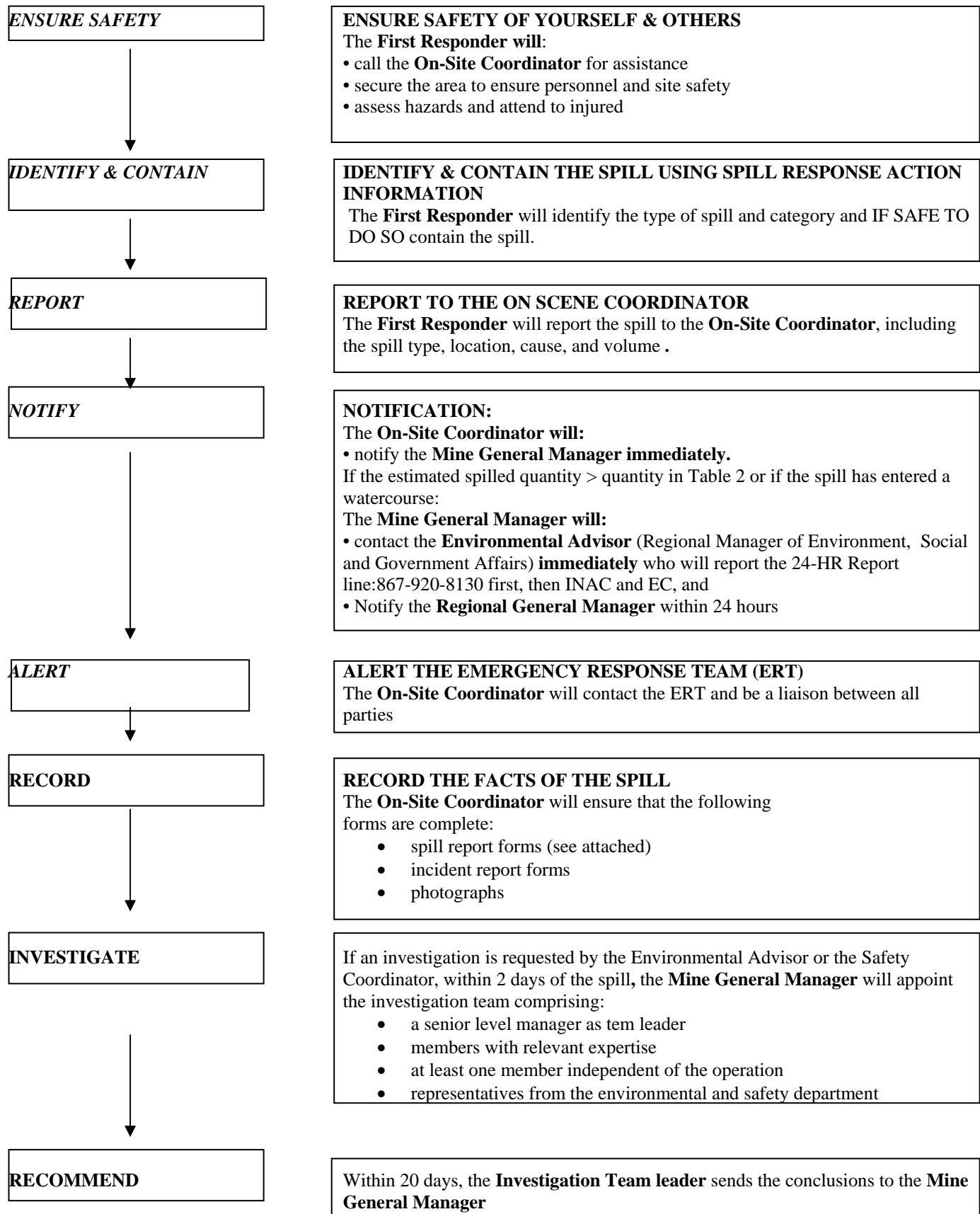
The Material Safety Data Sheets of the stored products should be kept in the storage area.

## **4.8. SPILL CONTINGENCY PLAN**

A spill contingency plan has been prepared for the Baker Lake Facilities and is included in Appendix C. For the purposes of this plan, a spill is defined as an accidental release of product into the environment that has the potential for adverse impact.

The plan is summarised in Figure 2 and 3.

**Figure 2: AEM Action Plan in the Event of a Spill**



**Figure 3**  
**Spill Reporting Procedure**

