

**HEALTH AND SAFETY
AND EMERGENCY RESPONSE PLAN**

**CLINTON CREEK
ABANDONED ASBESTOS MINE**

Prepared for:

UMA ENGINEERING LTD.

Prepared by:

SENES CONSULTANTS LIMITED

121 Granton Drive, Unit 12
Richmond Hill, Ontario L4B 3N4
CANADA

Tel: (905) 764-9380

Fax: (905) 764-9386

E-Mail: senes@senes.ca

Web Page: www.senes.ca

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1.0 PART 1 – GENERAL

1.1 APPLICATION

This plan applies to any work performed at the Clinton Creek site, with the exception of work where air monitoring has been carried out and the results of air monitoring have indicated that potential exposures to airborne asbestos fibres are below 25% of the Yukon Occupational Exposure Level (OEL) for chrysotile asbestos. The professional judgement of a competent person may also be relied upon to determine whether potential exposures are likely to exceed 25% of the OEL. Such judgement would be based upon knowledge of site conditions and results from previous air sampling programs.

Any area at the Clinton Creek site where demolition or removal of existing structures is carried out will be classified as a “restricted area”.

1.2 LOCATION

The Clinton Creek Asbestos Mine is located 100 km northwest of Dawson City in the Yukon Territory. The location is at 64⁰ 27' 00" N and 140⁰ 43' 00" W adjacent to Clinton Creek approximately 9 km upstream of its confluence with the Forty Mile River. Porcupine and Wolverine Creeks are local tributaries of Clinton Creek.

1.3 REGULATORY AGENCIES

- .1 Territorial requirements pertaining to asbestos are prescribed in the Yukon Occupational Health Regulations (Sections 33 – 41).

1.4 ABBREVIATIONS

The following abbreviations and definitions are used in this document:

1. ANSI American National Standards Institute. Publishes consensus standards on a wide variety of subjects, including safety equipment, procedures, etc.
2. CEPA Canadian Environmental Protection Act

3. CSA Canadian Standards Association, the national consensus standards association for Canada is roughly the Canadian equivalent of ANSI in the US
4. DIAND Department of Indian Affairs and Northern Development
5. ERP Emergency Response Plan
6. GY Government of Yukon
7. MSDS Material Safety Data Sheet provided by chemical manufacturers
8. MSHA Mine Safety and Health Administration, an agency of the US Department of Labour
9. NIOSH National Institute for Occupational Safety & Health. An arm of the US Centres for Disease Control, it does research and suggests guidelines for exposure control, but is not a regulatory agency
10. OSHA Occupational Safety & Health Administration, a part of the US Department of Labour, it regulates many job safety issues, including chemical handling and storage; also Occupational Safety & Health Act, the US Federal legislation which created OSHA (the Administration) and NIOSH
11. RMO Resource Management Officer
12. TDGA Transport of Dangerous Goods Act
13. WHMIS Workplace Hazardous Materials Information System. This program is legislated by the Canadian government, which requires, among other things, the creation and availability of material safety data sheets
14. OEL Occupational exposure limit
15. HEPA High Efficiency Particulate Aerosol

1.5 DEFINITIONS

“Asbestos” means chrysotile, crocidolite, amosite, tremolite, anthophyllite and actinolite when in their fibrous form.

“Asbestos Control Contractor” means an employer certified by an accredited agency as competent in asbestos control.

“HEPA filter” means high efficiency particulate aerosol filter.

“Restricted area” means an area of a work site in which there is a reasonable potential for worker exposure to airborne asbestos in an amount equal to or greater than 25% of the 8-hour Occupational Exposure Limit (OEL). (The 8-hour OEL for chrysotile asbestos is 0.5 fibres per millilitres of air (f/mP).

“HEPA vacuum” means a High Efficiency Particulate Aerosol (HEPA) filtered vacuum equipment acceptable to Health and Welfare Canada and meeting U.S. Military Standard 282. This vacuum equipment shall have a filtering system capable of collecting and retaining asbestos fibres to an efficiency of 99.97% for fibres of 0.3 micrometers or larger.

“Amended water” means water with a non-ionic surfactant added to reduce water tension to allow thorough wetting of asbestos fibres.

“Airlock” means a system for permitting ingress or egress without permitting air movement between a contaminated area and an uncontaminated area typically consisting of two curtained doorways at least 1.5 m apart.

“Curtained doorways” means an arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed by placing two overlapping sheets of polyethylene over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of one sheet along one vertical side of the doorway and securing the vertical edge of the other sheet along the opposite vertical side of the doorway. All free edges of polyethylene shall be reinforced with duct tape and the bottom edge shall be weighted to ensure proper closing. Each polyethylene sheet shall overlap openings an additional 1/3 of the doorway width.

“Wetting agent” means 50% polyoxethylene ester and 50% polyglycol or polyoxethylene ether, or equivalent approved product, and shall be mixed with water to a concentration to provide adequate penetration and wetting of asbestos-containing material.

“Authorized person” means a representative of the Government of Yukon, the Site Engineer or the Contractor.

1.6 EXISTING CONDITIONS

“Chrysotile” is the type of asbestos present at the Clinton Creek site.

1.7 COMMUNICATIONS

A satellite phone will be available on site for communication and emergency calls.

1.8 HAZARD IDENTIFICATION

1. Asbestos Hazards - inhalation of asbestos fibres by workers involved in work at the site.
2. Chemical Hazards - fuels used on site
3. Explosion or Fire - ignition of explosive or flammable liquids
4. Physical Hazards
 - mechanical equipment, sharp objects
 - increased risk of injury to personnel when wearing protective gear (if required) that may impair agility, stamina, hearing, and vision
 - electric shock when using power equipment in wet location or using poorly grounded tools
5. Wildlife - moderate risk (bears)

1.9 GENERAL HEALTH AND SAFETY MEASURES

1. All work will be conducted, as a minimum, in strict compliance to all applicable laws, ordinances, rules, regulations and orders and general practices for the safety of persons or property. The applicable requirements include any general safety rules and regulations of Yukon Workers' Compensation Health and Safety Board, WHMIS and Occupational Health and Safety legislation.
2. If deemed necessary, the Contractor shall provide wildlife monitors, acceptable to the Engineer, equipped with firearms to protect the safety of all workers including the Engineer, and Engineer's support staff during site operations.
3. Prior to the start of the work, all team members will participate in a mandatory safety briefing session to become familiar with all aspects of the Safety Program and Emergency Response Plan. Specific instructions on actions to be taken in case of safety violations, accidents, personal injury and emergencies will be provided.
4. Prior to commencement of specific work activities, all team members will be briefed on the following safety issues:
 - a. safety equipment and use
 - b. work procedures

- c. contaminants on site
 - d. emergency measures in case of an accident or fire
5. A "buddy system" will also be used as a protective measure in particularly hazardous situations so that team members can keep watch on one another to provide quick aid if needed.
 6. Contacts for emergency will include the GY project authority, the RCMP detachment and the nursing station in Dawson City, Yukon, and the Yukon Fuel and Oil Spills Report Line.

Head Protection

Head protection against impact blows will be provided when required in the form of a protective hat with a liner, which will be able to resist penetration and absorb the shock of a blow. The hat will meet CSA standard Z94.1.

Foot Protection

For protection against falling or rolling objects, sharp objects, wet, slippery surfaces workers will use appropriate insulated safety shoes or boots. Safety shoes will be sturdy, have an impact-resistant toe and meet CSA Standard Z195 or ANSI standards. In case of an emergency spill, team members responding will wear protective boot covers.

Eye and Face Protection

When required, protection will be based on the kind and degree of hazard present. Available equipment will include goggles, safety glasses, and face shield. The eye protectors will meet the requirements of CSA Z94.3 or ANSI standards.

Ear Protection

To avoid exposure to high noise levels disposable phone earplugs and/or earmuffs will be made available.

Respiratory Protection

It is anticipated that exposure to harmful concentrations of air contaminants may result from temporary or emergency conditions. In such a scenario, the exposed team members will wear protective respiratory equipment to prevent breathing air contaminated with harmful dusts (including asbestos), fumes, gases and vapours. The selection of protective respirators equipment will be made according to the guidance of NIOSH or MSHA or ANSI Practices for Respiratory Protection.

Arm and Hand Protection

Absorption of chemicals, cuts and burns are examples of hazards associated with arm and hand injuries. Insulated rubber gloves and leather gloves will be provided for protection from these hazards. These gloves will conform to CSA and ANSI standards.

1.10 SITE SAFETY MEETINGS AND INSPECTIONS

To ensure that the Site Safety Plan is being followed, the contractor will conduct a safety meeting prior to initiating each site activity and at the beginning of each workday.

The purpose of the meetings is to:

- X describe assigned tasks and their potential hazards;
- X co-ordinate activities;
- X identify methods and precautions to prevent injuries;
- X plan for emergencies;
- X describe any changes to the Site Safety Plan;
- X get worker feedback on conditions affecting safety and health;
- X get worker feedback on how well the Site Safety Plan is working.

The contractor will also conduct frequent inspections of site conditions, facilities, equipment and activities. The Site Safety Officer and personnel will be responsible for inspecting the condition of their personal protective equipment and ensuring its operational condition.

1.11 FIRST AID

First Aid will be administered on site by a qualified member of the Contractor's work force. The requirements for First Aid made available on site are to be met by an attendant with a Standard First Aid certificate, a # 2 Unit First Aid Kit (St. Johns Standard), a stretcher, and three emergency blankets. In addition to the basic requirements, a spinal board, cervical collars and a Scott Air Pack will also be on site. In case of an accident, a casualty will be transported to the nursing station at Dawson City, Yukon by ground or air transport, depending on weather conditions and the severity of the casualty. The preferred mode of air transport is via rotor wing (i.e. helicopter) although a small fixed wing air craft could likely land at the former mine air strip if required. An ambulance can be dispatched from Dawson City if weather conditions prevent air travel. Emergency phone numbers are provided in the ERP. Every incident requiring First Aid will be recorded in an accident report.

1.12 FIRES

The fire safety program includes fire prevention, fire protection and fire fighting.

1. As a preventative measure there will be no fires or burning of rubbish at the work site.
2. A person discovering a fire will report the incident to the Project Superintendent.
3. Fire extinguishers will be located on site and in each supervisor's vehicle.
4. Smoking will not be permitted in restricted areas and care will be exercised in the use of smoking materials in non-restricted areas.
5. The current National Fire Code of Canada shall govern the handling, storage and use of flammable liquids such as gasoline. Flammable liquids such as gasoline will be stored in approved safety cans.
6. Disposal of flammable liquids will be in accordance with all applicable environmental regulations.

2.0 PART 2 – WORK PRACTICES AND PROCEDURES

2.1 RESTRICTED AREAS – GENERAL REQUIREMENTS

- .1 A competent worker, certified in asbestos control procedures, must remain on site at all times during the work process.
- .2 Amended water shall be used to wet the ground surface or any other surfaces contaminated with asbestos prior to any disturbance of asbestos fibres and on a regular basis during the course of the work to control “dust”, as required.
- .3 All tools and equipment shall be thoroughly washed or cleaned with a vacuum equipped with a HEPA filter prior to being removed from a restricted area.
- .4 Access to restricted areas shall be limited to authorized persons.
- .5 No person shall be permitted to eat, drink or smoke in a restricted area.
- .6 Any person entering a restricted area shall be attired with protective clothing and equipment.
- .7 Signs shall be posted at the entrance to, or on the perimeter of a restricted area, indicating that:
 - (a) asbestos is present;
 - (b) access is limited to authorized personnel;
 - (c) asbestos is a carcinogen; and
 - (d) eating, drinking and smoking are prohibited.
- .8 Any person leaving a restricted area shall be free from asbestos contamination.
- .9 Compressed air shall not be used in a restricted area.

2.2 WORKER TRAINING

- .1 Prior to commencing work in a “restricted area”, direction and instruction shall be provided to all workers involved in the work outlining:
 - (a) the health hazards associated with exposure to asbestos fibres and the additional risk when combined with cigarette smoking;
 - (b) the requirement to wear the personal protective equipment as outlined by this plan;
 - (c) the use (including fit testing) and limitations of the respiratory protection being provided; and
 - (d) the work to be performed at the site.

2.3 WORKER PROTECTION

- .1 Protective equipment and facilities to be provided in a “restricted area” shall include:
 - (a) a complete change of clothing, including coveralls, caps and rubber boots, for each worker involved in work with asbestos;
 - (b) respiratory protection designed to protect against exposure to asbestos fibre;
 - (c) sanitary facilities within or close to the restricted area;
 - (d) a shower facility to remove all asbestos fibres from the body; and
 - (e) goggles, hard hats or other Personal Protective Equipment as required by the General Safety Regulations for the work being performed.

.2 Respiratory Protection

- .1 Provide workers with personally issued and marked respiratory equipment suitable for the asbestos exposure in the work area. Ensure that suitable respiratory protective equipment is worn by every worker who enters the restricted work area. A respirator provided by an employer and used by a worker:
 - (a) shall be fitted so that there is an effective seal between the respirator and the worker's face;
 - (b) shall be assigned to a worker for the worker's exclusive use;
 - (c) shall be used and maintained in accordance with the procedures specified by the equipment manufacturer;
 - (d) shall be cleaned, disinfected and inspected after use on each shift, or more often if necessary;
 - (e) shall have damaged or deteriorated parts replaced prior to being used by a worker; and
 - (f) when not in use, shall be stored in a convenient, clean and sanitary location.
- .2 Half-face air purifying respirators have a protection factor of 10. The maximum average airborne fibre concentration should, therefore, not exceed 5 f/mP if half-face respirators are to be used. Full-face powered-air purifying respirators (PAPRs) shall be used if the airborne fibre concentration exceeds 5.0 fibres per cubic centimetre of air, as outlined in Section 2.7.4. HEPA filters are the appropriate filter type for asbestos work.

.3 Protective Clothing

.1 Provide workers with protective clothing which shall:

- (a) be worn by every worker who enters the restricted work area;
- (b) be made of a material which does not readily retain nor permit penetration of asbestos fibres (e.g. Tyvek);
- (c) consist of full body covering including head covering with snug fitting cuffs at the wrists, ankles and neck;
- (d) include suitable footwear; and
- (e) be repaired or replaced if torn.

2.4 PERSONAL DECONTAMINATION

.1 At least three separate decontamination chambers shall be provided for workers to use to ensure that they and their clothing are free of asbestos contamination when they leave the work site. The decontamination chambers, except for the shower, shall be constructed of sufficient size to hold all the workers, their protective clothing and equipment, and their street clothing. A trailer may be appropriate for housing the decontamination facilities.

The Decontamination System shall comprise a serial arrangement of three separate compartments including a Clean Change Room, a Shower Room and a Transfer Room with an airlock separating each area.

- .1 *Clean Change Room:* Build a clean room between the shower room and clean areas outside of enclosures, with one airlock to the shower room. Install a mirror to permit workers to fit respiratory equipment properly; provide sufficient hangers and hooks; provide a bench or chairs.
- .2 *Shower Room:* Build a shower room with two airlocks: one to the Clean Change Room and one to the Transfer Room.

Provide a constant supply of hot and cold water. The Shower Room shall have individual controls inside the room to regulate water flow and temperature.

Provide piping and connect to water sources and drains. Provide soap and appropriate containers for disposal of used respirator filters. Note that workers may provide their own towels as these are not contaminated and may be removed from the site for cleaning.

- .3 *Transfer Room:* Build a Transfer Room between the Shower Room and the work areas, with one airlock to the Shower Room.
- .2 Every worker shall remove, store and dispose of all clothing and protective equipment, except for the respirator, while in the first chamber (or “Transfer Room”).
- .3 Every worker shall enter the shower with the respiratory equipment still in place.
- .4 After each worker has thoroughly washed their head, face and respirator, they may remove their respirators and discard the used filters.
- .5 In the third chamber (or “Clean Change Room”), workers shall dress in street clothing and store their respirators with new filters installed.
- .6 Facilities shall be provided within the Clean Change Room to store street clothing and to ensure that no contamination of street clothing occurs.
- .7 Reusable protective clothing worn in a restricted area shall be laundered, when necessary, and, in any event, not less frequently than every three days of use.
- .8 Protective clothing to be laundered shall be transported from a restricted area in sealed containers that are clearly labelled to indicate the contents and carcinogenic hazard with a warning that dust should not be breathed.

- .9 Used disposable protective clothing and discarded filters shall be treated as asbestos waste.
- .10 Doors between chambers shall be constructed of triple sheets of polyethylene, opening on alternating sides to ensure as good a seal as is reasonably practical between chambers.

A typical worker decontamination facility layout is provided in Appendix A.

2.5 WASTE HANDLING

All of the used disposable personal protective equipment (e.g. HEPA filters, Tyvek suits) and material collected during clean-up of the decontamination chambers shall be secured and sealed in polyethylene bags and transported to the on-site landfill for final disposal.

2.6 MEDICAL EXAMINATIONS

Medical examinations are required for “exposed workers” as specified in Sections 40 and 41 of the Yukon Occupational Health Regulations. “Exposed worker” is defined as “a worker who, for at least 10 days in a 12-month period, will likely be exposed to airborne asbestos in an amount equal to or greater than 25% of the 8-hour Occupational Exposure Limit”.

2.7 AIR MONITORING

1. Air samples may be taken from commencement of work until completion in asbestos work area(s) with NIOSH 7400 procedures, or with a Fibrous Aerosol Monitor.
2. Co-operate in collection of air samples, including requiring workers to wear sampling pumps for up to half shift periods. Workers shall exercise care not to damage air sampling equipment.
3. A portable battery-operated sampling pump is used to draw air through a 25 mm, 0.8 um pore size, cellulose ester filter at a constant flow rate for a sufficient period of time to collect a representative sample of air for personnel in the work area. The air sample(s) are then retrieved and analysed by Phase Contrast Microscopy (PCM).
4. If air monitoring shows airborne fibre levels exceed 10X the time-weighted average exposure criteria (TWAEC) of 0.5 fibres per cubic centimetre of air (f/cc) for personal

exposure, then workers will be required to use powered air purifying respirators (PAPRs) with full-face piece and HEPA filters.

5. All air sampling test results will be kept on site and made available to workers for their review.

3.0 EMERGENCY RESPONSE PLAN

This Emergency Response Plan (ERP) includes actions to be taken to reduce the impact of any “emergency” situation which arises during the course of work at the site. A list of emergency contacts, including those for medical emergencies and emergency reporting are given below.

Project Management:

Hugh Copland (GY) (867) 667-3208

Brett Hartshorne (INAC) (867) 667-3268

Site Engineer (UMA Engineering) on-site

Yukon Fuel and oil Spills Report Line: (867) 667-7244

Dawson City, Community Nursing Station: (867) 993-4444

Ambulance: Dawson City, Yukon (867) 993-4444 or 1-800-661-0408

Trans North Helicopters (867) 993-5494 or 668-2177

Fireweed Helicopters (867) 993-5700

Resource Management Officer (RMO):

Todd Pilgrim (867) 993-5468

RCMP Dawson City, Yukon: (867) 993-5555 or 667-5555

Incident: Hazardous Material or Nonaqueous Phase Liquid Spill

The response measures include:

1. Contain spill source and prevent from spreading.
2. Air monitor for explosive or toxic gases. If a hazardous condition is found, the appropriate protective equipment will be used.
3. Mobilize spill control kit. The kit will include:
 - X Personal protective equipment
 - X Recovery drum
 - X Absorbent material

- X Hand shovel
 - X Small pail for scooping up liquid
 - X Plastic sheeting
4. Recover spill and contaminated material and place in recovery drum.
 5. Ensure spill is secure.
 6. Implement a decontamination procedure before any employee or equipment leaves the area of potential hazardous exposure.
 7. Transport recovery drum to temporary storage area. A polyethylene drop sheet will be secured to the ground at the temporary storage area
 8. The sorting, packaging, transportation and disposal of all hazardous materials and waste encountered will be in accordance to all applicable regulations including the TDGA and CEPA.
 9. Prepare spill report.
 10. Call the Yukon Fuel and Oil Spill Report Line.

Incident: Serious Injury

1. Call for help.
2. Assess hazards at the site; if necessary make area safe.
3. Initial First Aid.
4. Evacuate casualty to the nursing station in Dawson City, Yukon
5. Prepare report.

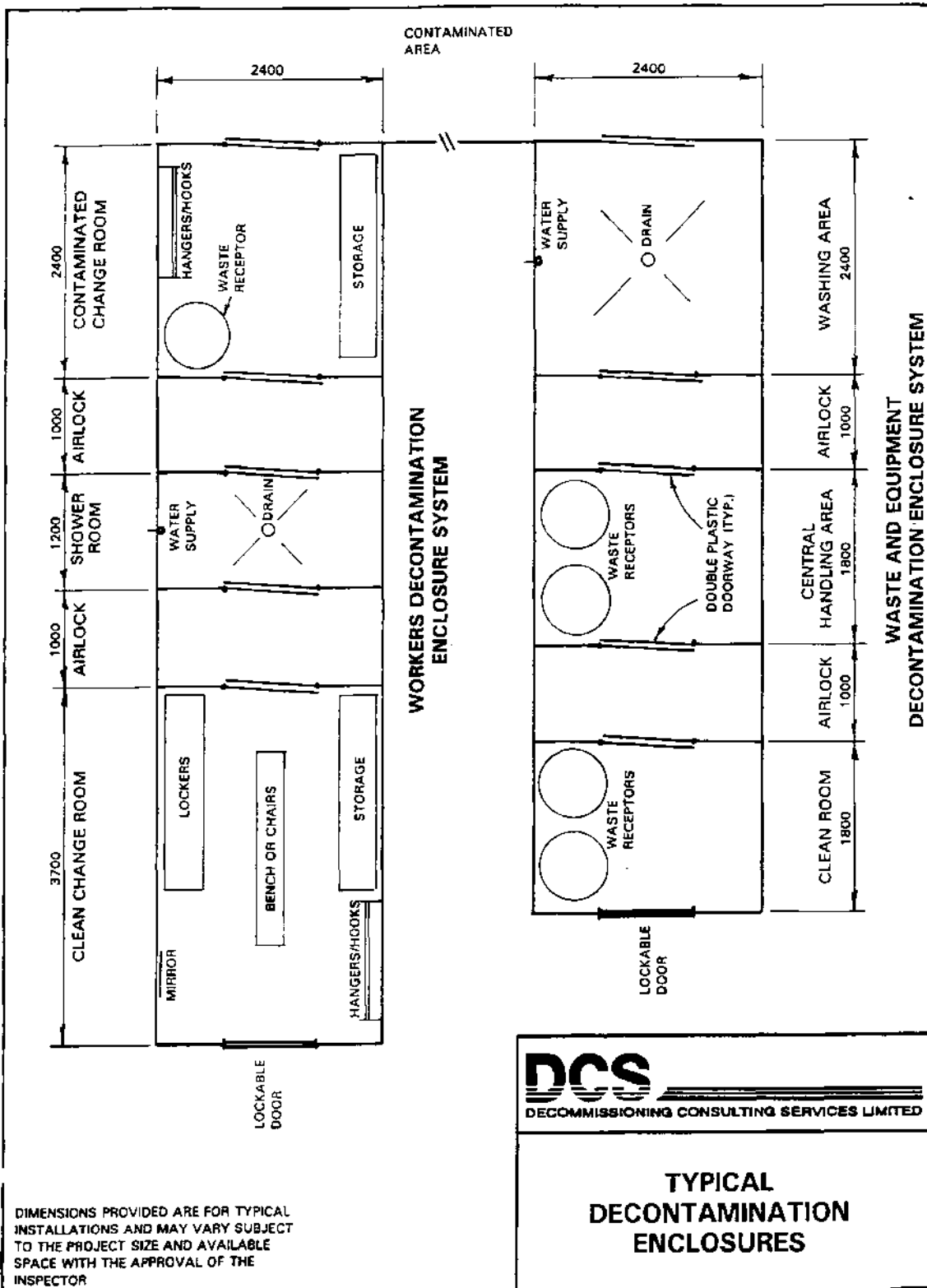
Incident: Fires

1. A person discovering a fire will report the incident to the Project Manger.
2. Fire suppression equipment will be made available. If a fire is not promptly extinguished, the RMO in Dawson City, Yukon will be notified immediately.

APPENDIX A

TYPICAL WORKER DECONTAMINATION FACILITY LAYOUT

SENES



DIMENSIONS PROVIDED ARE FOR TYPICAL INSTALLATIONS AND MAY VARY SUBJECT TO THE PROJECT SIZE AND AVAILABLE SPACE WITH THE APPROVAL OF THE INSPECTOR



TYPICAL DECONTAMINATION ENCLOSURES