



Safety Guidelines for Mineral Exploration in Newfoundland and Labrador

Table of Contents

Table of Contents	ii
List of Figures.....	v
List of Links	vi
1.0 PURPOSE	1
2.0 GENERAL SAFETY	1
2.1 Responsibilities	1
2.1.1 Employers.....	1
2.1.2 Supervisors.....	2
2.1.3 Workers	3
2.1.4 Principal Contractor	3
2.2 Incident/Accident Reporting.....	3
2.3 Hazard Assessment	4
2.4 Risk Control.....	4
2.5 Personal Protective Equipment (PPE)	5
2.5.1 Face and Eye Protection.....	5
2.5.2 Hearing Protection	5
2.5.3 Protective Headgear	6
2.5.4 Gloves	6
2.5.5 Footwear.....	6
2.5.6 Respiratory Protection	6
2.5.7 High Visibility Apparel	7
2.5.8 Other PPE	7
2.6 Sun Protection	7
2.7 Working Alone.....	8
2.8 Thermal Environment	8
2.9 Hazardous Substances	9

3.0	EMERGENCY PLAN	9
3.1	Communications.....	9
3.2	Fire Fighting Equipment	9
3.3	First Aid.....	10
3.4	Emergency Ambulatory Services.....	11
4.0	TRANSPORTATION	11
4.1	Foot Travel.....	11
4.2	Winter Travel.....	12
4.3	Ice Safety	13
4.4	Bridge Crossings.....	14
4.5	Snowmobiles/All-Terrain Vehicles (ATVs)	14
4.6	Mobile Equipment.....	14
4.7	Aircraft	15
4.8	Water Travel.....	15
5.0	CAMP MANAGEMENT	16
5.1	Fire Prevention.....	16
5.2	Fire Hazards.....	16
5.3	Sanitation and Hygiene	17
5.4	Electricity/Generators	18
5.5	Ventilation	18
5.6	Smoking, Drugs and Alcohol	18
5.7	Lightning.....	19
5.8	Wildlife and Insects	19

6.0	MACHINERY, TOOLS, AND EQUIPMENT	20
6.1	Explosives	21
6.2	Lock-out/Tag-out	22
6.3	Guarding	22
7.0	EXPLORATION ACTIVITIES.....	22
7.1	Diamond Drilling	22
	7.1.2 Drill Shack	23
	7.1.3 Guarding.....	24
7.2	Brush Cutting	24
7.3	Trenching	25
7.4	Geophysical Work	25
7.5	Old Abandoned Workings.....	26
 APPENDIX A		
	First Aid	27

List of Figures

Figure 1: Respirator Masks.....	7
Figure 2: Helicopter Slings a Load.....	15
Figure 3: Chainsaw Safety.....	20
Figure 4: Explosives Signage	22
Figure 5: Diamond Drill Bits	23
Figure 6: Drill Shack	24

List of Links

Service NL

Environmental Health Licenses

http://www.servicenl.gov.nl.ca/licenses/env_health/ -

Fire Protection Services Act

<http://assembly.nl.ca/Legislation/sr/statutes/f11-01.htm>

OHS Division, Service NL

<http://www.servicenl.gov.nl.ca/ohs/index.html>

OHS Regulations

<http://www.assembly.nl.ca/Legislation/sr/Regulations/rc120005.htm>

First Aid Regulations

<http://assembly.nl.ca/Legislation/sr/regulations/rc961148.htm>

OHS Explanation Guide

<http://www.servicenl.gov.nl.ca/ohs/guide/index.html>

Department of Environment and Conservation

<http://www.env.gov.nl.ca/env/>

Application for Crown Land

http://www.env.gov.nl.ca/env/forms/lands/app_crown_land.pdf

Environmental Standards for Waste Management at Remote Camps

http://www.env.gov.nl.ca/env/env_protection/waste/guidancedocs/remote_exploration_camps.pdf

Department of Natural Resources

<http://www.nr.gov.nl.ca/nr/>

Forestry Permits/ Licenses

<http://www.nr.gov.nl.ca/nr/forestry/permits/licence.html#burn>

Mineral Exploration Standards Regulations

<http://www.assembly.nl.ca/legislation/sr/regulations/rc070039.htm>

Guidebook to Exploration, Development and Mining in NL

http://www.nr.gov.nl.ca/nr/mines/exploration/guidelines/Guidebook%20March27_2012.pdf

Other Links

Workplace Health Safety and Compensation Commission (WHSCC)
www.whscc.nl.ca

CSA Standards
<http://shop.csa.ca/en/canada/products/icat/publications>

List of Ambulance Contacts for NL
http://www.health.gov.nl.ca/health/findhealthservices/road_ambulance_contacts.pdf -

Department of Justice, Canada: Explosives Act
<http://laws-lois.justice.gc.ca/eng/acts/E-17/>

Dangerous Good Transportation Act NL
<http://assembly.nl.ca/legislation/sr/statutes/d01.htm>

“Keep Your Eyes on the Hook” Video – Transport Canada
<http://www.youtube.com/watch?v=eESeTQVjOTY>

Firearms Act & Regulations - RCMP
<http://www.rcmp-grc.gc.ca/cfp-pcaf/pol-leg/act-loi-eng.htm>

1.0 PURPOSE

This mineral exploration guideline was developed by the Occupational Health and Safety (OHS) Division of Service NL, to increase awareness around health and safety issues within the mineral exploration sector. The information contained in this document is intended to provide some guidance to the development of an employer's Occupational Health and Safety Program. Employers are to continue using a risk management approach to managing safety at their workplaces.

2.0 GENERAL SAFETY

2.1 Responsibilities

While safety is everyone's responsibility, the *Occupational Health and Safety Act* section 4 states "***An employer shall ensure where it is reasonably practicable, the health, safety and welfare of his or her workers.***" Employers, supervisors, workers, contractors, general contractors and visitors must be aware of and follow safety procedures. It is the employer's responsibility to ensure all personnel are trained, visitors are briefed, general safety rules are posted and a copy of the Occupational Health and Safety Regulations are available on site.

2.1.1 Employers

Before an exploration activity commences, an employer shall form an OHS field committee and/or appoint a representative to carry out and oversee safety responsibilities in the field, reporting regularly to the employer. An OHS Program is required for exploration companies given the nature of the work and the hazards involved. Refer to s. 12 of the OHS Regulations.

Specific duties of the employer are outlined in the *Occupational Health and Safety Act* in section 5. The types of things to be considered include but are not limited to:

a) ***The provision of safe equipment, systems and tools***

Consider the hazards related to remote sites, camps, drills, snowmobiles, ATVs, drill cutting shacks, helicopters, geological survey equipment, uneven terrain, weather conditions, working alone, wildlife, etc. Mechanisms, such as

inspections, should be in place to ensure that the workplace and equipment is maintained in a safe condition.

b) *Information, instruction, training and supervision*

All workers must be provided with: an orientation (including demonstrations); operational training on equipment (drills, skidders, muskegs, ATVs, chain saws, snowmobiles, sleighs, satellite phones, etc.); and training in safe work procedures (lock-out/tag-out, operating equipment, maintaining equipment, wildlife awareness, accessing site, working at height, etc.).

c) *Ensure workers and supervisors are aware of hazards*

Employers must ensure that site specific hazard assessments are conducted for your exploration sites and that controls such as safe work procedures are in place. You must ensure that hazard communication and hazard reporting systems are in place and ensure workers/supervisors are aware of the general and site specific hazards.

d) *Conduct work such that persons not employed are not exposed to health or safety hazards*

Employers must have a mechanism in place to warn the general public of hazards related to your exploration activities.

2.1.2 Supervisors

Supervisors are responsible to ensure the health and safety of the workers under their supervision (s. 5.1 and 5.2 of the *OHS Act*) For example, supervisors are required to:

- Advise workers of hazards;
- Provide proper instruction; and,
- Ensure use of personal protective equipment (e.g. when workers are performing drilling or rock chipping, ensure that work boots suitable to the terrain and weather conditions, appropriate eye and face protection, hard hats, and gloves are worn by the workers).

2.1.3 Workers

Workers are responsible to protect their own safety and the safety of others on a worksite. They shall cooperate with the employer by following safe work procedures and make use of protective equipment and clothing provided for his/her protection. Workers shall immediately alert the supervisor of any potential or existing hazards and report any incident or injury (s.7 of the *OHS Act*).

2.1.4 Principal Contractor

The principal contractor shall ensure compliance with the Act and Regulations by all personnel including employers, contractors, workers and self-employed persons performing work in respect of project (s. 10 of the *OHS Act* and s. 19, 20 and 21 of the OHS Regulations).

2.2 Incident/Accident Reporting

Section 54(1) of the *OHS Act* requires Incident/Accident Reporting. The supervisor in the area where the incident/accident occurred secures the scene and immediately notifies the appropriate authorities. Appropriate authorities to be considered shall be included in the emergency response plan (reference s. 3.0 of this Guideline).

Procedures for accident reporting shall be communicated to and followed by workers and contractors. All incidents/accidents shall be reported to the site supervisor and the written record shall include:

- date/time and place of event;
- details of those involved; and,
- description of nature of event or injury.

Refer to Workplace, Health, Safety and Compensation Commission (WHSCC) handbook on Accident/Incident Investigations at www.whscc.nl.ca for further help with conducting an investigation and writing an investigation report. The OHS Division has a 24-hour accident reporting line 709-729-4444. **All serious incidents/accidents must be immediately reported to the OHS Division.**

2.3 Hazard Assessment

Employers shall ensure that hazard assessments are conducted for mineral exploration work activities. The goal of the hazard assessment is to identify the hazard and determine the significance of the risk. A hazard assessment is best conducted by a team of individuals who consider the work activities, processes, and equipment utilized. The main personnel that should be involved include: a worker who faces the risk directly, a work supervisor who understands the implications of risks, someone trained in the hazard assessment process, and someone who has a specialized knowledge of identified workplace hazards, proper techniques and procedures. In some cases, external sources may need to be consulted to aid in the assessment process. For example, in determining the significance of worker exposure to silica during a drill core cutting operation, an employer may need to consult with a company with expertise in this area.

2.4 Risk Control

When determining appropriate controls for hazards identified, employers must consider the hierarchy of controls. The primary goal of risk control is to eliminate the risk. The best way of achieving this is to remove the hazard. If this is not possible, the risk must be minimized using one or more of the other control options from the hierarchy. The risk control measure selected must be the highest possible option in the hierarchy to minimize the risk to the lowest level as reasonably practicable.

The hierarchy of controls includes:

Order No.	Control	Example
1	Eliminate	Removing the hazard, e.g. taking a hazardous piece of equipment out of service.
2	Substitute	Replacing a hazardous substance or process with a less hazardous one, e.g. substituting a hazardous substance with a non-hazardous substance.
3	Isolation	Isolating the hazard from the person at risk, e.g. using a guard or barrier.
4	Engineering	Redesign a process or a piece of equipment to make it less hazardous.
5	Administrative	Adopting safe work practices or providing appropriate training, instruction or information.

6	Personal Protective Equipment	The use of personal protective equipment could include using gloves, glasses, earmuffs, aprons, safety footwear, and dust masks.
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In many cases, it will be necessary to use more than one control method. Secondary controls, such as personal protective equipment, should only be used as a last resort or as a support to other control measures.

2.5 Personal Protective Equipment (PPE)

All personal protective equipment is to be selected based upon the hazards identified during the risk assessment process of the activity to be undertaken. Personal Protective Equipment shall be fitted properly, be comfortable and provide the proper protection to the wearer. PPE that is not properly fitted to the individual worker is a hazard and will not provide the desired level of protection. When considering proper fit, the range of body shapes and sizes and gender need to be considered. One size does not “fit all”.

2.5.1 Face and Eye Protection

When exposed to hazards likely to injure or irritate the eye or face (such as flying objects and particles, splashing liquids, or when walking through brush) wear face and eye protection that is appropriate to the hazard. CSA certified safety glasses also come in prescription and non-prescription forms.

2.5.2 Hearing Protection

Noise level assessments must be conducted to determine the level of hearing protection required (s. 68 (2) of the OHS Regulations). Noise exposure to more than 85 dB over an eight hour period is not permissible and prolonged exposure may permanently damage a worker’s hearing. The employer shall reduce noise to acceptable levels or isolate workers from the noise. If neither of these options is viable, an employee shall wear CSA approved hearing protection. The best hearing protection for any worker is one that is comfortable and can be worn consistently. If noise exposures are greater than 85 dB than an employer will be required to develop a hearing conservation program.

2.5.3 Protective Headgear

When on drill sites and mine sites, approved CSA Type II hard hats shall be worn. A comfortable fit is necessary. Painting, piercing, or altering a hard hat can weaken it and is not permitted.

2.5.4 Gloves

There are many types of gloves available, and it is important to match the glove to the hazard from which you need protection. Gloves protect the hands from temperature extremes, corrosive materials, chemicals and cuts and scrapes. Gloves must properly fit the wearer so as not to create additional hazards.

2.5.5 Footwear

Safety footwear is designed to protect a worker's feet against injuries such as impact, compression, and puncture (s.80 (1) of the OHS Regulations). The employer shall ensure that footwear is CSA approved and suitable for the work, the terrain, and the weather conditions (snow, rain, etc.) likely to be encountered.

2.5.6 Respiratory Protection

Various fumes and dusts may be produced and may have detrimental effects when inhaled. The proper respiratory protection equipment is chosen based on the hazard or specific contaminant and user factors that affect the performance and reliability must be considered. Section 83 of the OHS Regulations, requires a respiratory protection program to be implemented when workers are exposed to dust or other contaminants and required to wear respirators. Figure 1 provides examples of respirator mask.

Potential contaminants include dry drilling in drill shacks, using rock saws and core splitters. In the hierarchy of controls, when saws and core splitters are used they must be equipped with engineering controls such as dust suppression systems and exhaust systems (filtered to the outside). Given the abundance of silica in the rock, section 46 of the OHS Regulations refers to the silica regulation and shall be considered.



Figure 1: Respirator Masks

2.5.7 High Visibility Apparel

High visibility apparel (HVA) is clothing that shall be worn to alert others of a worker's presence, especially in low light and dark conditions. HVA headwear can also be worn to alert others when a worker's body is obscured or not visible. Such situations may include: when a helicopter is bringing in supplies, when drilling or using machinery, or during hunting season. When selecting HVA, size/coverage, fit, brightness, design, and color should be considered. Please refer to the High Visibility Apparel policy referenced in the OHS Guidance Document and s. 81 of the OHS Regulations.

2.5.8 Other PPE

Depending on the work environment and type of work being conducted, other PPE may be required, such as:

- waterproof clothing for when a worker is exposed to rain or snow conditions;
- personal flotation device (PFD) required if working over water or on ice; and,
- thermal clothing for extreme cold.

2.6 Sun Protection

Workers in the mineral exploration industry are at risk of over-exposure to UV radiation. Sun safety should be practiced in all seasons and is not exclusive to sunny conditions. Workers should also be protected when it is overcast, raining and snowing. Workers and employers need to be aware of the hazards of solar radiation and need to take measures to limit exposure, such as:

- using appropriate attire (i.e. broad brimmed hats, sunglasses, lip balm, and sunscreen);
- adjusting work schedules to avoid working during the hottest part of the day; and/or,

- erecting shelters from the sun.

The Canadian Cancer Society recommends that for prolonged exposure, workers use a SPF 30+ sunscreen (UVA and UVB), being sure to follow the instructions on the bottle. If you are using both sunscreen and bug repellent, apply the sunscreen first so that it will be absorbed into your skin. It is also important to note that reflections can double the strength of UV rays.

2.7 Working Alone

Before an employee is assigned to work alone (s. 15 of the OHS Regulations), the following must be ensured:

- a risk assessment is completed which identifies the hazards, as well as the appropriate controls to eliminate, isolate or minimize the hazards; and,
- a procedure for checking the wellbeing of the workers working alone are developed, put in writing and followed. The procedures shall include: communication methods, time intervals between checks, record of checks and procedures to follow in the event the worker cannot be contacted. These are to be reviewed at least annually.

2.8 Thermal Environment

Exposure to and working for long periods in extreme heat or cold is a concern with mineral exploration. Employers need to take steps to protect workers from exposure and temperature related sickness by:

- adjusting work schedules and monitoring time worked in heat or cold;
- considering frequency of breaks;
- reducing physical demands;
- providing plenty of drinking water or warm liquids as appropriate;
- encouraging daily and frequent applications of sunscreen year round;
- training workers how to dress and operate safely in extreme temperatures;
- providing appropriate clothing (waterproof, insulated), shelter, and special equipment;
- providing information on symptoms of hypothermia, heat exhaustion, etc. and additional first aid actions required;

- providing medical supervision, acclimatization procedures; and,
- other appropriate controls and measures that are practical to the situation.

A thermal environment includes aspects of the work environment such as temperature, humidity, air velocity and the presence of radiating surfaces.

2.9 Hazardous Substances

Hazardous substances can be in the form of solids, liquids or gases and can be any material that poses a threat to humans, living organisms, the environment or property. Hazardous substances must be monitored, and where possible, must be substituted and/or replaced. If substitution is not an option, engineering and administrative controls must be implemented to ensure safe use. The location of Material Safety Data Sheets (MSDS) must be communicated to workers. Employees must understand the information on MSDSs and follow the directions as indicated on the MSDS. Depending on the type of hazardous substance and amount of substance kept on site, employees may be required to be trained in Workplace Hazardous Material Information Systems (WHMIS). Also refer to section 42 of the OHS Regulations.

3.0 EMERGENCY PLAN

Section 38 (2) of the OHS Regulations requires that an emergency preparedness plan shall be established, communicated to and understood by all employees, contractors and visitors. Refer to WHSCC handbook on Emergency Preparedness and Response at www.whscc.nl.ca.

3.1 Communications

A dependable communication system must be established and communicated to employees before exploration begins. Access to constant two-way communication is important when personnel are working, especially in remote areas. A satellite phone is suggested for remote areas where cell phone service is limited.

3.2 Firefighting Equipment

Firefighting equipment must be suitable for the class of fire being contained. Each drill must have a fire extinguisher as a minimum and workers must be trained in how to

properly use it. All firefighting equipment should be clearly identified and kept in a visible area. A supply of water should be available and accessible for firefighting purposes on an exploration site. Emergency plan procedures are dependent on a reliable communications system in order to obtain the assistance of external fire response capability is needed.

3.3 First Aid

The employer is responsible for providing appropriate first aid including first aid supplies and equipment, adequately trained first aiders, and equipment necessary to transport injured workers to medical treatment. The provision of first aid at exploration sites must be based upon an assessment of workplace conditions. At a minimum, the assessment shall include:

- the number of workers who may require first aid at any time;
- the nature and extent of the risks and hazards in the workplace;
- the types of injuries likely to occur;
- any barriers to first aid being provided to an injured worker; and,
- the time that may be required to obtain transportation and to transport an injured worker to medical treatment.

Depending on the results of the workplace assessment, first aid supplies, training and equipment requirements may range from a number 1 first aid kit with level 1 (emergency) training to needing a level 3 first aid kit, first aid room, an industrial ambulance and equipment along with one or more first aid attendants (level 3 training). See Appendix A for examples of first aid provisions based on a generic assessment of typical exploration sites.

Prior to commencement of exploration activity, it is the responsibility of the employer to ensure that a site specific assessment is conducted including an assessment of the necessary first aid facilities. Further, the employer shall ensure that the workplace is re-assessed when conditions change and at a minimum on an annual basis (where exploration continues beyond a year). The employer shall retain first aid registers for at least five years from the date of the last entry.

3.4 Emergency Ambulatory Services

Exploration companies must ensure that all local emergency contact numbers (including police, fire department, hospitals and ambulance—including air ambulance) are determined, provided to employees and supervisors, posted in appropriate locations around the site and programmed into communication systems. Exploration companies should be aware that not all helicopter service providers are capable of providing air ambulance service. A request for air ambulance service should either go directly to the Air Ambulance Coordinator or to the police or local ambulance service. Protocols must be developed and in some cases, arrangements must be made with helicopter service providers for emergency response services. The necessity for this would be determined in the assessment process.

Employers should also be aware that currently 911 services are only available in the northeast Avalon, Corner Brook/Bay of Islands area, and Labrador City. In *all* other areas of the province, the local ambulance service must be contacted directly for emergency response. Up to date emergency contact information for ambulance services can be obtained online or by contacting the Department of Health and Community Services directly.

4.0 TRANSPORTATION

Exploration requires several means of transportation in all seasons and weather conditions.

4.1 Foot Travel

Prior to setting out on foot, always check equipment being used to ensure it is in good working condition. Carry usual items found in a day pack:

- compass/GPS;
- pocket knife;
- waterproof matches;
- food;
- water;
- extra clothing;
- waterproof clothing;

- flashlight;
- thermal reflective blanket;
- bear deterrents;
- rope;
- signal flares;
- small first aid kit;
- prescription medication; and,
- two-way communication device or satellite phone.

Precautions that should be taken to prevent mishaps from occurring include:

- planning the route of travel prior to setting out and communicate it to your supervisor;
- checking the forecast before travelling;
- marking the route travelled; if an emergency occurs along the route, response time may be greatly decreased if the route can be followed;
- travelling in pairs wherever possible; if there is some distance between partners, make sure both workers have a means of communication;
- using extra caution when travelling alone; make sure your supervisor knows your route, destination, and estimated return time; and,
- ensuring there is a process in place to initiate a search or secure and rescue if you do not return by an agreed upon time.

4.2 Winter Travel

Travelling by foot in remote locations at any time of the year can be dangerous. However, travelling in the winter can be especially so. The weather will dictate the necessity for extra supplies and clothing along with detailed planning. Additional precautions taken when travelling in winter include but are not limited to:

- paying particular attention to hazardous areas such as stream crossings, pond/lake crossings and areas of thin ice. Changing weather conditions, particularly in the spring, make it necessary to periodically inspect the route for hazards;
- wearing appropriate winter clothing, dressing in layers to suit climate and condition;

- always taking snowshoes;
- pacing yourself to avoid heavy exertion that could cause sweating; and,
- wearing sunscreen and sun glasses.

4.3 Ice Safety

Travelling over ice or working on ice (such as drilling on an ice covered pond or lake) is dangerous and extra precautions need to be taken. It is the responsibility of the employer to determine whether ice conditions are safe for any intended scope of work activity. Water depths at given locations where workers may be travelling or working must be determined. Be sure to measure clear hard ice in several places. Records should be kept of all measurements including water depths and ice thickness, air and water temperatures for comparison throughout the intended period of work.

Recommended minimum ice thicknesses are as follows:

- 3" (7.5 cm) or less – STAY OFF
- 4" (10 cm) – ice fishing, walking, cross country skiing
- 5" (12.5 cm) – one vehicle - snowmobile or ATV
- 8-12" (20-30 cm) – one vehicle – car or small pickup
- 12-15" (30-38 cm) – one vehicle – medium truck

It is critical that the ice quality or type of ice is evaluated before you travel. Clear, hard, new ice is the only kind of ice recommended for travel or work. Salt water and fresh water have obvious different characteristics that affect ice development and thickness.

STAY AWAY FROM:

- slushy ice;
- ice on or near moving water (i.e. rivers, currents);
- ice that has thawed and refrozen; and,
- layered or "rotten" ice caused by sudden temperature changes.

Other factors that weaken or "rot" ice:

- snow on ice that acts as a blanket to prevent hardening of ice; and,
- pressure ridges due to wind or current pressure.

Persons walking over ice must have on their ice cleats and wear a PFD over their outerwear. Avoid ice if travelling alone.

4.4 Bridge Crossings

Prior to travelling to an exploration site, the employer shall determine whether there are any bridge crossings along the proposed route. A bridge used to transport equipment and materials shall be capable of supporting the total weight being transported on the bridge. The inspection and maintenance of bridges installed along forest access roads comes under the jurisdiction of the **Department of Natural Resources, Forest Engineering and Industry Services Division**. Some bridges installed along forest access roads remain in place but are closed to vehicular traffic. Other bridges are restricted to light vehicle use only. It is very important that the Department of Natural Resources be contacted prior to crossing bridges in order to determine any restrictions placed on them.

4.5 Snowmobiles/All-Terrain Vehicles (ATVs)

Before snowmobiles and ATVs set out on an exploration, a tool kit, spare parts, emergency equipment, and basic survival equipment must be carried on the vehicle. A throwbag should also be used when using a snowmobile for transportation. Materials or equipment transported on a vehicle in which a worker is riding shall be properly located and secured to prevent injury. Volatile or flammable products shall not be transported in the same enclosed compartment as workers. Snowmobiles and ATVs shall be maintained in accordance with manufacturers' specifications. Ensure that the drivers and passengers of snowmobiles and ATVs wear appropriately approved helmets, face masks and goggles. Drivers should use caution when crossing small streams and check conditions of the riverbanks as they may be muddy causing an ATV to become stuck or rollover.

4.6 Mobile Equipment

Mobile equipment requires inspection, repair and maintenance as specified in manufacturers' instructions. Maintenance and repair records must be kept and available for inspection. Rental equipment should also be inspected to ensure the equipment is in good working condition and has been properly maintained. Only licensed and qualified

personnel may operate mobile equipment. Operators of heavy equipment must remain aware of their surroundings at all times. A formal communications system shall be established between the machine operator and those on foot or in light vehicles, and all personnel are to be instructed in this system. All mobile equipment must be equipped with fire extinguishers and passenger/operator restraint devices must be in good working order and used by personnel.

4.7 Aircraft

The pilot of an aircraft is the captain and their instructions shall be followed at all times. They are personally responsible for the safety of the flight and should not be distracted while flying. An employer shall develop safe work procedures to be followed when around a helicopter, including proper helicopter approach by passengers and during slinging operations (see Figure 2), and ensure employees are trained in these procedures. The ground crew must always have direct communication with the pilot during slinging operations to ensure safe deposit of the materials. Transport Canada has developed a training video entitled “Keep Your Eyes on the Hook” that may be helpful in developing safe slinging procedures: <http://www.youtube.com/watch?v=eESeTQVjOTY>. The pilot and ground crew must be aware of and familiar with slinging procedures and hand signals, and have clear communication that is absolutely understood by all involved. Refer to sections 346 through to 361 of the OHS Regulations.

Figure 2: Helicopter Slinging a Load



4.8 Water Travel

Boating plans, including forecast, destination, and departure and return dates/times must be communicated to the appropriate supervisor. Personnel are required to wear a personal floatation device appropriate to the work environment and hazards. All boats or canoes are to be provided with equipment in accordance to the provincial and federal

regulatory requirement. Follow Transport Canada's guidelines for certification of operators in boating safety.

5.0 CAMP MANAGEMENT

5.1 Fire Prevention

Fire safety is an important component of an emergency plan and a key element to camp management is fire safety and prevention. The removal of potential fire hazards and ignition sources and reducing quantities of fuel are proactive measures that will minimize the chances of a fire onsite. All employees must be trained in basic fire safety including use of fire extinguishers. For the design and occupancy of structures, installation of fire alarms, use of detection equipment and fire protection equipment, follow Fire Prevention Regulations under the *Fire Prevention Act, 1991*.

5.2 Fire Hazards

A fire hazard can be a solid, liquid or gas that poses a threat of igniting and/or feeding a fire. Workers should report any hazards to the site supervisor and/or ensure the hazard is removed or disarmed. All hazardous goods and flammable materials must be stored and used as per material safety data sheets (MSDSs) and written safe work procedures developed and followed in the safe handling and use of hazardous materials.

Fire extinguishers should be kept near each tent and building and adequately marked for visibility. An adequate number of fire extinguishers should be located at each fueling point for vehicles, power saws, or pumps. A designated fire pump, a suitably sized reservoir from which water can be drawn and an adequate supply of hoses is required.

Flammable liquids must be stored away from living and working quarters and overhanging trees. Buildings used to store flammable liquids must be adequately ventilated to prevent an accumulation of vapours. All ignition sources must be eliminated. Fuel drums must be clearly labeled, visibly listing the contents. Fuel storage containers must be CSA approved for that purpose and be properly grounded prior to the transfer of fuel. Fire Regulations prohibit smoking around flammable liquids and compliance must be ensured.

Tents can be a fire hazard if exposed to heat, spark or fire generated from heating apparatuses. Ensure that chimneys are adequately insulated from the tent wall with fire retardant material or metal inserts, and separate the tents adequately to prevent the spread of fires.

When space heaters and water heaters are used in tents, they should be placed on metal stands and have clearance from flammable surfaces as specified by the manufacturer. To prevent burning through the metal bottom of an airtight heater, spread a thin layer of sand or sandy soil underneath heater. Avoid starting wood fires with flammable liquids. Plan ahead and purchase solid-fuel fire starter if you intend to use wood fires. Lanterns should be situated (hung) so that they are not easily dislodged and to avoid spilling kerosene. To control and contain campfires, build a small fire pit.

5.3 Sanitation and Hygiene

Remote work camps are subject to all provincial and federal legislation applicable to waste management practices. Please refer to

http://www.env.gov.nl.ca/env/env_protection/waste/guidancedocs/remote_exploration_camps.pdf.

Employers must ensure an adequate and accessible supply of potable water, which has been tested and approved by the appropriate health authority. If contamination is suspected and uncontaminated water is not available due to work location, the use of water purification tablets is suggested. Sufficient potable water including hot and cold running water should also be provided for hand washing, personal hygiene, cooking and cleaning purposes. Sufficient water for flushing toilets and laundry facilities should also be provided. Please refer to sections 61 through to 67 of the OHS Regulations.

Eating areas, separate from the work areas, are required to be kept clean and must have hand washing facilities close by in the event an employee comes into contact with a substance that could likely contaminate people, clothing or food. Refer to section 65 under the OHS Regulations.

5.4 Electricity/Generators

Electrical supply to camps is typically provided by a generator. Before using a generator, the operator should read the manufacturer's instruction manual for proper use and safety of the machine (section 489(1) of the OHS Regulations). Any temporary electrical work must be completed by a competent person. Generators are to be grounded and must be adequately vented to the outdoors.

5.5 Ventilation

Ventilation is important in providing good air quality. When work gives off dust, fumes, vapor, mist or other impurities that may impair worker health, the employer shall provide and maintain a proper ventilation system. The employer must ensure workers are trained and protected against the buildup of harmful gases from the burning of material in enclosed areas. Some of these concerns include:

- the buildup of carbon monoxide or other gases; and,
- the depletion of oxygen; etc.

Carbon monoxide monitors are required in all enclosed buildings where any petroleum product or wood is being used as a source of fuel. (Refer to s. 45 of the OHS Regs).

5.6 Smoking, Drugs, and Alcohol

Smoking is not permitted in any work place. An employer may, in accordance with the Smoke Free Environment regulations, designate one or more enclosed rooms that are under that employer's control as designated smoking rooms for employees. An employer shall post and keep posted signs prescribed under the regulations prohibiting smoking in a workplace as well as signs that identify designated smoking room.

The possession or use of drugs and alcohol is strictly prohibited on a work site. A zero tolerance policy is recommended and should be established, communicated, and posted around the site for employees and visitors (refer to s. 26 (2) of the OHS Regs).

5.7 Lightning

The employer shall ensure that written procedures are developed and workers are trained in the procedures for the hazards associated with lightning in the area. When in camp and outdoors, precautions should be taken to avoid this hazard during weather events likely to produce lightning including:

- staying indoors away from metal;
- moving away from the drill rig as the mast may act as a lightning rod; and,
- avoiding standing under tall trees or in open spaces as they are susceptible to lightning strikes.

5.8 Wildlife and Insects

Working in remote areas increases the potential for wildlife encounters. Employers need to have a wildlife program and this would include an education component covering topics like: animal habitat and habits, avoidance practices, procedures to deal with animal encounters, and procedures to deal with animal attacks. Control measures include things like effective waste management practices, electric fencing, bear spray, noise deterrents and fire arms. Always follow the Canadian Firearms Regulations and guidelines as outlined on <http://www.rcmp-grc.gc.ca/cfp-pcaf/pol-leg/act-loi-eng.htm> when using firearms. In general, the only firearms allowed for wilderness protection are non-restricted rifles and shotguns. The following individuals, provided they are Canadian residents and have a license that allows them to possess restricted firearms, may be authorized to carry a handgun or restricted long gun for wilderness protection:

- licensed professional trappers; and,
- individuals who need protection from wild animals while working at their lawful occupation, most often in remote wilderness location.

There is always a concern of an allergic reaction to insects and insect bites which can be fatal, especially while travelling or working in remote areas. To mitigate this concern, employees should be encouraged to complete a voluntary medical history questionnaire before arriving on site. Mosquitoes, black flies and deer flies are found throughout the province and exposure can be managed through such measures as encouraging appropriately coloured clothing, using insect repellents, and avoiding times of the day when insects are most active.

6.0 MACHINERY, TOOLS AND EQUIPMENT

Every worksite should contain equipment necessary to safely perform the intended scope of work. When using machinery or tools, employees should review, understand and follow the manufacturer's operating and safety instructions and always inspect the tool and equipment prior to use to ensure safety devices are working and equipment is in good condition. Workers must always wear the appropriate PPE for the type of machinery or tools being operated.

Axes and Knives

When selecting an axe or knife, the user should consider the condition, durability and for what it is being used. If travel is necessary while carrying the axe, always put the blade protector or sheath on the blade with the blade pointing away from your body.

Rock Hammers and Chisels

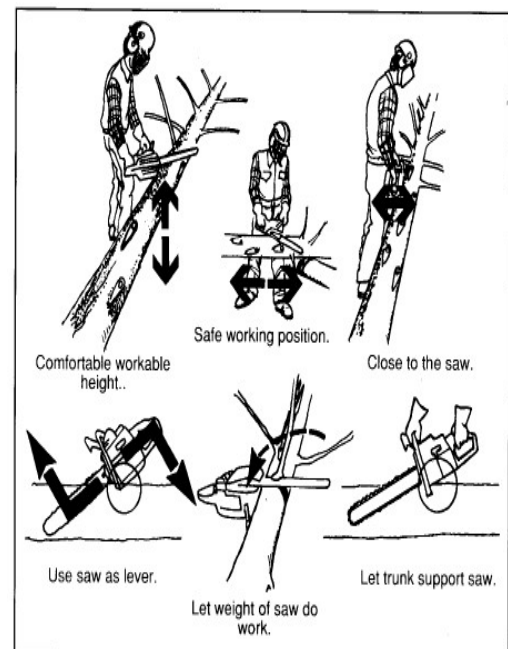
The selection of a rock hammer or a chisel depends on the condition, durability and for what it will be used. Eye protection is a necessity as it protects against flying debris caused by hammering.

Chainsaws

Before using a chainsaw, an operator should review, understand and follow the manufacturer's operating and safety instructions. Most chainsaw injuries are caused by "kick-back". A kick-back is when the saw bounces back out of the cut and the operator loses control of the saw. Wearing the appropriate PPE can help reduce the potential for and severity of an injury. The required PPE includes:

- leg protection - nylon pads protecting the leg from 12 inches above the knee to 12 inches below the knee;
- hard hat;
- hearing protection;
- safety glasses/ goggles or face shield;
- chainsaw boots; and,
- non- slip gloves.

Figure 3: Chainsaw Safety



Standard guidelines for safe use include:

- ensuring the chain is properly sharpened, tensioned and all parts are tight;
- starting the saw on a stump or on the ground, not on your knee;
- not walking with the chainsaw while the chainsaw is running;
- carry with blade facing behind; and,
- keeping a first aid kit nearby.

6.1 Explosives

Only personnel who have been trained and certified are authorized to handle and use explosives. Visibly mark the location of a loaded hole and never leave a loaded hole unattended. Prior to a blast, alert all personnel of blasting operation. Security procedures need to be implemented to prevent inadvertent access to loaded holes by unauthorized personnel. Vehicles or other mechanical equipment shall not be driven or moved over an explosive, a blasting accessory or a hole containing an explosive. A blasting operation should not be carried out on the approach of or during an electrical storm and personnel must remain outside the danger area for the duration of the weather event. Display appropriate signage when blasting to alert personnel of existing dangers (refer to s. 417 of OHS Regulations).

Explosives should be stored in a day box marked “Explosives” or stored in an approved and licensed magazine. Only a person authorized by the employer should be permitted access to the explosives. This person is responsible to ensure accurate inventory records are maintained and available to an officer upon inspection. Records need to account for the quantity and type of explosive stored including detonators for at least three previous years. For security purposes, a copy of the inventory record should be kept at a place other than in the magazine. Theft or missing explosives is a serious matter and accurate inventories, security measures and regular inspection of magazines will help to mitigate this risk. For further details see sections 417(i), 420(1), 422(4), 425 of the OHS Regulations. See also the ***Explosives Act (Canada), the Fire Prevention Act, 1991 and the Dangerous Goods Transportation Act*** for the handling and transport of explosives. For further details on storage, handling and transportation refer to sections 427 and 428 of OHS Regulations.



Figure 4: Clear, concise signage for Explosives

6.2 Lock-out/ Tag-out

Written lock-out/tag-out procedures must be developed, communicated to workers and included in worker orientation, training and tool box talks. Locking and/or tagging machinery or systems lets others know the device or system is locked out and cannot be inadvertently started or energized, particularly while workers are working on them. Lock-out procedures must be used while maintenance work is being done on machinery or systems and locks or tags can only be removed by the worker who affixed it. Refer to sections 127 through to 137 of the OHS Regulations.

6.3 Guarding

Machinery, tools, and equipment with exposed moving parts, cutting or grinding edges and pinch points must have appropriate guarding in place. Guards must never be tampered with or modified. Never remove a safety guard. Operators should follow the manufacturer's safety manual for the proper use and maintenance procedures. Guards should only be removed for maintenance activities and only after proper lock-out/tag-out procedures have been implemented.

7.0 EXPLORATION ACTIVITIES

7.1 Diamond Drilling

Many accidents around drill sites can be attributed to poor site layout and poor housekeeping. Others can be attributed to inadequate site planning and preparation. Sites must be assessed jointly by the exploration company and drilling contractor representatives well in advance of rig setup to identify and resolve potential problems.

Only experienced trained people shall operate drilling equipment and drill rigs cannot be modified without approval of the manufacturer or a qualified engineer.

Industry associations, such as the Canadian Diamond Drilling Association, can provide hazard alerts, procedures and training programs for drill companies. Where it is likely that the drill may encounter pockets of gas, a risk assessment shall be done to determine the appropriate gas testing/warning monitor that may be required. Employees are required to undergo training on gases, their recognition, and required treatment if exposure occurs. In addition, employees must receive training on emergency response equipment that must be available at the work site. All drills must be equipped with emergency rations/water, first aid supplies, eye wash facilities appropriate to the chemicals being used, adequate communication equipment, and MSD sheets. All rigging and fall protection equipment must be inspected, labeled and stored as per regulations and manufacturers' specifications. Workers using fall arrest equipment must attend a training session as approved by WHSCC for the Province of Newfoundland and Labrador.

Procedures shall be developed and communicated to all on site to address issues related to emergency response and must take into consideration inclement weather. A rod handling procedure shall be developed to address pre-drilling, production, maintenance, post-drilling and jammed rods. A written lock-out/tag-out procedure shall be developed and the workers trained in said procedure. Lock-out procedures must be used while carrying out maintenance work or repairs on drills. As well, all guards on belts, chains and gears must be replaced after removal for maintenance.



Figure 5: Diamond Drill Bits

7.1.2 Drill Shack

All heating units/stoves, with an open flame, must be placed on the outside of the drill shack to prevent burns and inadvertent ignition of flammable products (such as hydraulic

fluids). Drill shacks shall be equipped with appropriate fire fighting equipment and with fire extinguishers located on both the interior and exterior of the building. Depending on the geology in the area where drilling is occurring, radon or radioactive radon progeny may build up within the drill shack. The employer should assess the potential for radon exposure prior to commencing drilling operations. Ventilation is critical to avoid exposure to gases, fumes and exhaust from equipment. An inspection and maintenance program must be developed and implemented based upon the manufacturer's requirements. For example, hydraulic hoses/couplings must be inspected on a regular basis and couplings must be tightened as per manufactures' specifications. Additionally, all maintenance work must be done by a qualified person utilizing appropriate lock-out/tag-out procedures.



Figure 6: Drill Shack

7.1.3 Guarding

All moving parts of a drill and its auxiliary equipment must be guarded, including, but not limited to: the drill rods, foot clamp, wire line, rotating shafts on water pumps, transmissions/gears/shafts and motor fans. All high pressure hoses/pipes and fittings shall be adequate for their purpose and shall be suitably restrained in case of breakage.

7.2 Brush Cutting

An employer should complete a pre-exploration survey of brush to determine the appropriate machinery and equipment required for clearing of the exploration site. Having a map of the area to be cleared should be taken into consideration. An operator of the brush cutting equipment must be trained on the use of the equipment, be instructed in and follow the manufacturer's operating instructions. See sections 474 and 475 of the OHS Regulations which deals with the felling of trees and use of brush saws.

7.3 Trenching

Trenching activity requires that the sides of an excavation be sloped to a safe angle or secured by the use of sheet piling, shoring or a trench box as outlined in section 406 of the OHS Regulations. Section 407 of the OHS Regulations states, “***Where a worker is required to enter an excavation greater than 1.22 metres deep, a ladder shall be provided in the immediate area where the worker is employed, extending from the bottom of the excavation to at least 0.91 metres above the top of the excavation.***”

Barriers must be installed around the trench and caution signs posted to alert employees of the hazard. When working on or around trenches, other safety precautions to consider are:

- wearing the necessary PPE (eye protection, steel toe boots, etc.) for the job;
- having an effective means of two-way communication available if injury or accident occurs; and,
- follow safety procedures and instruct personnel to keep a safe distance from excavation equipment.

Please refer to sections 404 through to 408 and 410 of the OHS Regulations.

7.4 Geophysical Work

Geophysical work or Induced Polarization (IP) is becoming more commonly used in the province as a method of identifying subsurface geology. The primary safety concern with this method of mineral exploration is the electric current, which is induced into the ground by use of a high voltage transmitter and electrodes. Communication is essential in restricting access to the work areas in which the current is being induced and received. All workers must be familiar with safe work procedures developed for this process and must have a means of communicating between workers. Due to the nature of terrain in Newfoundland and Labrador, it will most likely be impossible to have visual contact between workers in the area where IP work is occurring. Additionally, when working near populated areas, methods to control public access, inadvertent or otherwise, will need to be implemented. Other safety concerns include exposed pointed electrodes, which most likely would need to be secured and covered during transporting (either by machine or by hand), and the hand-carrying of equipment over rough terrain. All other safety concerns related to working in a remote area will likely also be present.

7.5 Old Abandoned Workings

Hazards that may be encountered in underground workings may include dangerous atmospheres, poor ground conditions, high water, wild animals, dried feces from bats/animals, etc. It is the responsibility of the employer to ensure that no one works within 100m of old workings or abandoned workings until the employer has:

- completed an examination of the old workings or abandoned workings by a professional engineer to determine their condition; and,
- made available to the Occupational Health and Safety Committee or worker representative the findings of the examination.

If old or abandoned workings are not accessible for examination, the employer shall develop a safe work procedure for work within 100m of the workings, approved by a professional engineer, and shall submit the safe work procedure to the Occupational Health and Safety Committee. Nobody shall enter old workings until the Occupational Health and Safety Division of Service NL has been notified. A gas monitoring and rescue plan, including adequate mine rescue teams and equipment, must be developed and submitted to the Occupational Health and Safety Division of Service NL prior to entering mine workings.

APPENDIX A

FIRST AID

High Risk

This table is an example of first aid provisions for a workplace where the employer determined through the assessment of workplace conditions there is a **high** risk of injury and the worksite is more than 20 minutes surface travel time away from a hospital.

Item	Number of Workers Per Shift	Supplies, Equipment and Facility	Level of First Aid	Transportation
1	1	Number 1 First Aid Kit	Emergency	
2	2-5	Number 2 First Aid Kit Stretcher, Blankets and Splints	Standard	
3	6-10	Number 2 First Aid Kit Stretcher, Blankets and Splints Emergency Transportation Vehicle (ETV) Equipment	Standard	Emergency Transportation Vehicle (ETV)
4	11-30	Number 3 First Aid Kit Stretcher, Blankets and Splints Dressing Station Emergency Transportation Vehicle (ETV) Equipment	Advanced Medical First Responder (Level 1 – Attendant)	ETV
5	31-50	Number 3 First Aid Kit Stretcher, Blankets and Splints First Aid Room Emergency Transportation Vehicle (ETV) Equipment	Advanced Medical First Responder (Level 1 – Attendant)	ETV
6	51-200	Number 3 First Aid Kit Stretcher, Blankets and Splints First Aid Room Industrial Ambulance Equipment	Advanced Medical First Responder (Level 2 EMR – Ambulance)	Industrial Ambulance
7	201 or more	Number 3 First Aid Kit Stretcher, Blankets and Splints First Aid Room Industrial Ambulance Equipment	Two Advanced Medical First Responders (Level 2 EMR – Ambulance)	Industrial Ambulance

First Aid Facilities: Recommended Minimum Criteria

Tables 1 and 2 give examples of minimum levels of first aid for various workplaces. These tables indicate in column 3 whether or not a first aid facility is required, and, if a facility is required, what type (dressing station or first aid room). This document gives guidance on how to set up a first aid facility and some specific recommendations for dressing stations and first aid rooms. It also includes recommendations for portable oxygen therapy equipment and oxygen powered resuscitators which may be part of the necessary equipment in the facility.

Under section 13 of the Occupational Health and Safety First Aid Regulations, a first aid facility must be kept clean, dry, ready for use, and must be readily accessible at any time a worker works in the workplace.

General recommendations for all first aid facilities

Location and access

A first aid facility should be located as near as practicable to the work area or areas it is to serve. It should be a room within a building or, if this is not practicable, a tent, vehicle, or other suitable structure.

The first aid facility should be designed and located for easy entrance to and exit from the facility for a worker requiring stretcher transport. A stretcher should not have to be tipped or turned to enter or exit the first aid facility.

In remote areas, building a first aid facility may not be practicable. However, the facility should be at least of the same design and construction as workers' lodgings. If trailers are provided for workers' lodgings, a trailer should be provided for the first aid facility.

When a tent is used, it should:

- be of the same size and have the same equipment as a first aid room or dressing station, as appropriate;
- be fitted with a non-porous floor that can be cleaned with soap and water; and,
- have a source of heat that will provide sufficient warmth for good patient care (maintaining body temperature).

A first aid facility may be locked to prevent theft and vandalism or for other appropriate reasons. If so, there must be effective means of immediate access during all working hours.

Utilities

The facility should be adequately illuminated, heated, and ventilated. It should have a sink plumbed with hot and cold running water or, if this is not practicable, an alternative system for supplying fresh, potable water. If showering may be a required treatment for chemical exposure, the facility should have a shower or have a shower facility as near as practicable.

It may be impracticable to plumb a first aid facility in certain situations, such as where the facility is a trailer on a construction site or the work is at a remote location. In these cases, one of the following alternative sources of water, with means to heat it, may be considered until a permanent source of water can be connected:

- the facility has an internal tank able to hold a minimum of 45 liters (10 gallons) of fresh potable water which can be pumped into the facility's sink. The water in this tank must be changed daily, or changed weekly if treated for the prevention of contamination;
- the facility is connected to a hose or water line from a fresh potable water outlet that can be pumped into the facility's sink;
- the facility has an insulated container able to hold about 20 liters (five gallons) of fresh potable water changed daily to prevent contamination; or,
- a fresh water supply company provides fresh water in a bottle or jug attached to a hot/cold dispenser.

Other recommendations

Since the facility must be kept clean and sanitary, a non-porous floor covering is recommended.

The facility should have a notice displayed so that it can be obviously seen outside the door or in the area, indicating how to call and where to find the attendant.

Smoking is not permitted in a first aid facility, and "No Smoking" signs should be posted so that they are clearly obvious.

Additional recommendations for dressing stations

In addition to the previous recommendations for a facility, a dressing station should be at least 4.3 square metres (48 sq ft). It should have the following dressing station equipment:

- | | |
|-----|---|
| 3 | blankets |
| 6 | metal splints, minimum length 60 cm |
| 1 | refuse pail with lid |
| 1 | package of paper towels |
| 1 | bifocal magnifier with head strap, 12.5 cm focus |
| 1 | eye cup |
| 6 | safety pins |
| 1 | 11.5 cm stainless steel sliver forceps |
| 1 | 14 cm stainless steel bandage scissors |
| 1 | oral thermometer |
| 1 | nail brush |
| 1 | penlight or flashlight with batteries |
| 50 | patient assessment charts |
| 1 | first aid record book, and pencil or pen |
| 1 | 150 ml liquid antibacterial soap |
| 4 | cold packs |
| 20 | tongue depressors |
| 50 | cotton tip applicators |
| 2 | 30 gram tubes water soluble burn treatment |
| 1 | 100 ml liquid adhesive tape remover |
| 100 | sterile adhesive dressings, assorted sizes, individually packaged |
| 24 | sterile skin closures, individually packaged |
| 6 | 20 cm x 25 cm sterile abdominal dressings, individually packaged |
| 3 | 30 cm x 40 cm sterile abdominal dressings, individually packaged |
| 4 | sterile eye pads, individually packaged |

100	7.5 cm x 7.5 cm gauze sponges
24	7.5 cm x 7.5 cm sterile gauze dressings, individually packaged
24	10 cm x 10 cm sterile gauze dressings, individually packaged
4	7.5 cm x 4.5 m crepe roller bandages
2	10 cm x 16.5 cm sterile pressure dressings, with crepe ties
1	7.5 cm x 4.5 m adhesive crepe bandage
2	2.5 cm x 4.5 m rolls of adhesive tape
2	5 cm x 4.5 m rolls of adhesive tape
1	7.5 cm x 4.5 m esmarch gum rubber bandage
2	5 cm x 1.8 m conforming gauze roller bandages
2	7.5 cm x 1.8 m conforming gauze roller bandages
12	cotton triangular bandages, minimum length of base 1.25 m
1	#01 - 4.5 m tubular finger bandage with applicator
1	500 ml sterile 0.9% sodium chloride solution (saline)
1	kidney basin
1	wash basin
1	cold instrument sterilizer
1	4.5 liter non-rusting germicidal solution for instrument tray
1	chair suitable for treating injured worker with non-porous surface or covered with non-porous material

Additional recommendations for first aid rooms

See Schedule E of the Occupational Health and Safety First Aid Regulations for furnishings and equipment requirements of a first aid room.

In addition, a first aid room should be at least 9.3 square metres (100 sq ft). It should have:

- storage cupboards;
- a counter; and,
- a toilet, or have a toilet facility as near as practicable.

At a remote workplace (more than two hours surface travel time to a hospital), a first aid room should be equipped to provide reasonable overnight care for two injured workers and be used exclusively for first aid purposes.

Portable oxygen therapy equipment

When an Advanced Medical First Responder is necessary at the workplace, portable oxygen therapy equipment should be available. The equipment should:

- be capable of supplying 15 liters per minute of oxygen; and,
- contain enough oxygen to supply this rate from the time of initial application to the arrival at medical treatment, plus 15 minutes.

Oxygen therapy equipment should comply with *CSA Standard CAN/CSA Z305.3.M87, Pressure Regulators, Gauges, and Flow-Metering Devices for Medical Gases*, or a similar acceptable standard.

“No Smoking” signs or markings should be plainly visible on oxygen therapy equipment.

An oxygen cylinder should be hydrostatically tested on refilling if five years have elapsed since the previous test or, if there has been no previous test, since the date of manufacture. The test date should be marked on the cylinder.

Oxygen powered resuscitators

An oxygen powered resuscitator may be used where a worker is injured and entrapped in a toxic atmosphere. An oxygen powered resuscitator should be maintained and operated in accordance with the manufacturer's specifications.

Only a person trained in the use of the specific equipment should operate it. This training should include a minimum of four hours training in the safe operation of the equipment from the supplier or other qualified person. The training must include all facets of the equipment's operation, handling, and storage. Refresher training or practice should take place every six months, and a training record of the initial and subsequent training should be maintained by the employer.

Emergency Vehicles and Equipment

Tables 1 and 2 give examples of minimum levels of first aid for various workplaces. These tables indicate whether or not an emergency vehicle is required, and, if an emergency vehicle is required, what type (emergency transportation vehicle or industrial ambulance) is to be available at the workplace. This document gives guidance on the use of emergency vehicles and the equipment needed. It also suggests when a mobile treatment centre might be used in the place of a first aid facility and emergency vehicle. It also provides recommendations for air transport when that is the primary means to getting an injured worker to medical treatment.

Note that the Occupational Health and Safety Division does not approve of any particular makes or models of emergency vehicles and does not register vehicles.

General guidelines for emergency vehicles

Emergency vehicles must be maintained and operated in accordance with the general requirements relating to Powered Mobile Equipment in the Occupational Health and Safety Regulations and with any other applicable statutes and regulations under the Motor Registration Division of Service NL.

Smoking is not permitted in a workplace vehicle including when it is used for transporting an injured worker and a plainly visible "No Smoking" sign should be posted in the vehicle.

Location and access

Where a vehicle is needed to transport an injured worker, the vehicle should be immediately available for use and capable of being dispatched to the accident scene within three to five minutes of being required. It should be located where it will best serve the workers who are most likely to need an emergency vehicle.

The attendant should not operate the vehicle when this may interfere with the required first aid treatment.

Vehicle requirements

Sometimes an employer may have different vehicles used for different parts of the journey to treatment. The following are recommended for each vehicle:

- the vehicle should be capable of traversing the area it is intended to serve;
- it should have minimum headroom of one metre (3.3 feet);
- it should provide protection from the natural elements and dust;
- it should provide warmth sufficient for good care for the injured worker, with the patient compartment heated enough to maintain normal body temperature when the injured worker is covered with three blankets. The source of heat must not be a hazard to the occupants of the vehicle when oxygen is in use;
- it should have effective voice communication between the operator and the attendant in the treatment area of the vehicle;
- it should have a means of effective communication with the scene of an accident. For example:
 - the driver has a two-way radio that has a direct link with another two-way radio at the scene of the injured or ill worker; or,
 - the driver has a two-way radio that has a link with the employer's central dispatch centre, which has voice communication via a radio or radiotelephone with workers at the scene.
- it should have effective communication with the hospital. For example:
 - the driver has a two-way radio that has a direct link with the hospital;
 - a radiotelephone in the vehicle can contact the hospital directly;
 - a two-way radio or radiotelephone in the vehicle has a link with the employer's central dispatch centre, which has voice communication via a telephone or radiotelephone with the hospital; or,
 - the emergency vehicle is accompanied to the hospital by another vehicle that is equipped with a radiotelephone or two-way radio that can contact the hospital directly and its driver can communicate with the emergency vehicle.
- Vehicles that transport injured or ill workers do not need to have mounted emergency lights or an audible signal (such as a siren). Before obtaining this type of equipment, the employer or the company supplying the vehicle should consult with the appropriate authority having jurisdiction.

Additional recommendations for an emergency transport vehicle (ETV)

In addition to the general recommendations for emergency vehicles, an ETV should be capable of transporting at least one worker on a stretcher. It should have a means of restraining a stretcher and have enough padding to prevent excessive jarring of the injured worker.

An ETV should contain the following equipment:

- 1 set of hard cervical collars covering all adult sizes (or two adjustable hard cervical collars)
- 1 spine board with handholds, no less than 44 cm x 1.8 m x 2 cm and seven 1.8 m x 5 cm heavy Velcro straps or equivalent to secure an injured worker
- 1 stretcher (whenever an injured worker may require transport over rough terrain a basket stretcher or other carrying device must be used. The basket stretcher must have a spine board with handholds and retainer straps and a suitable mattress or padding)

- 6 blankets (unless weather conditions at the workplace require more for the safe treatment or transport of injured workers, in which case suitable weather-resistant protection may also be needed)
- 2 4.5 kg sand bags
- 2 vomitus bags

When an Advanced Medical First Responder is necessary, the following should be added:

1 set of splints, to include:

- 2 splints (1 cm x 10 cm x 1 m notched with 2.5 cm padding)
- 1 splint (1 cm x 10 cm x 1.5 m notched with 2.5 cm padding)

Additional recommendations for an industrial ambulance

In addition to the general recommendations for emergency vehicles, an industrial ambulance should:

- be used only for first aid treatment and transportation of injured workers, under the direction of the first aid attendant;
- be capable of accommodating at least two workers on stretchers;
- have adequate lighting in the patient compartment, allowing the attendant to see and assess the injured or ill worker and complete documentation, without the use of a flashlight; and,
- contain a roll cot or basket stretcher properly secured and cushioned against excessive jarring.

An industrial ambulance should contain the same equipment as an ETV plus a set of lower limb splints.

Mobile treatment centre (MTC)

An MTC is an industrial ambulance that also has:

- a sink with running water or, if this is not practicable, an alternative system for supplying fresh, potable water;
- minimum headroom of 1.8 metres (six feet) in the treatment area, sufficient for the attendant to treat the injured worker; and
- dressing station equipment.

An MTC may be used in place of a first aid facility and emergency vehicle (ETV or industrial ambulance). This is recommended only when all the following circumstances apply:

- the workplace does not provide overnight accommodation for workers;
- where the workplace is more than two hours surface travel time from a hospital, another vehicle suitable for transporting an injured worker is also provided; and,
- when used in place of a first aid room, the MTC contains the necessary first aid room equipment.

Air transport

If air transport is the primary or only means of transporting an injured worker to medical treatment, the following arrangements and equipment are recommended:

- make arrangements with an air service, before the start of work, to ensure that an appropriate aircraft will be reasonably available during operations;
- the aircraft should be capable of transporting a stretcher patient and a first aid attendant, allowing the attendant sufficient room to provide emergency treatment en route, if required;
- a list of radio frequencies to be used between the air carrier and the workplace should be included in the written procedures required by section 38(2) of the Occupational Health and Safety Regulations. The coordinates of the workplace should be included in the written procedures;
- first aid equipment should be suitable for the aircraft to be used, including a stretcher or spine board that will fit in the aircraft and that does not allow movement or excessive jarring of the injured or ill worker during air transport. Employers are responsible for ensuring that attendants are properly trained in the use of the equipment; and,
- if weather or other factors could unreasonably delay the use of aircraft, alternative transportation options should be provided, where practicable.

The attendant has training to decide whether air or surface transportation is most appropriate for the injured or ill worker.

