Section III

Exposure Control
Respirator Program

Silica * Asbestos * Lead

Chemical & Biological

0720485 BC Ltd.

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Acknowledgement

This Occupational Health and Safety Manual was developed by Mike Winbow for 0720485 BC Ltd. These sections are designed to meet or excide the laws governing work in British Columbia, Canada as set forth by the Workers Compensation Act. under the jurisdiction of WorkSafe BC

This manual has been designed to encompass the full spectrum of Occupational Health and Safety as it relates to the work activities of 0720485 BC Ltd. The manual will have additions as new safety measures are introduced or repealed. If this occurs before the annual review, the new pages will be added to the correct sections in sequence.

The information in this Section does not take precedence over applicable government legislation, with which all workers and management should be familiar with. If for any reason the legislation should change where as The Workers Compensation Act, WorkSafe BC Regulations, Guidelines, Policy, or Standards set forth a NEW and SAFER legislation, then the rule applies that the safer way supersedes all other practices and statements applying a rule.

Annual Program Review

On an annual basis, management in conjunction with company safety professionals will conduct a review of the Occupational Health and Safety Program and Manual. This will be conducted by way of directly speaking with managers, workers, safety representatives and supervisors. Site inspections will be reviewed as well as statistical information, injury claims, reports and any other relevant documentation and information that will be helpful in determining a course of action for improvement. A meeting will be held to review the overall performance of the program and to discuss any implementation on the recommendations made. The policies, rules and procedures of this manual should be compared to training records, company and supervisors' reports, accident investigations, worker personal safety training files, inspection reports and any other pertinent information to determinant if any improvements can be accomplished

The Safety Program Annual Review will be conducted using the standards set by Regional Governing Bodies, Construction Associations and other applicable standards. Recommendations for revisions to the safety program will also come from safety meetings that were forwarded to the management for implementation. The month of October or November will be scheduled for the audit and a date will be specified for compliance.

The Annual Program Review and assessment of the past year statistics derived from 0720485 BC Ltd. documentation as well as the workers conducting the tasks will be utilized for developing safety initiatives. Those potentially could be added to the program to assist in governing the actions of all workers and any subcontractors on a 0720485 BC Ltd. project. When completed, the new additions will further help workers conduct their job-related tasks in the safest way possible. If for any reason, it needs to be revised outside of the annual review time, then the section or parts will be reviewed and if needed a change could occur.

1. Exposure Control Plan

1.1 General

Exposure Control & Safety Plans including site specific work procedures have been developed with the intent to reflect the manner in which all harmful substance abatement work will be performed, including the performance of work within situations such as but not limited to confined spaces, and elevated heights. To be effective, Exposure Control & Safety Plans are dynamic and not static, and therefore will be subject to revision from time to time, as dictated by the dynamics of the work. As work conditions, processes and or changes in the scope of work maybe subject to change; this plan must be revised to reflect any and or all changes in working conditions, scope of work and or work processes. In the event the site specific ECP work procedures do not accurately reflect the manner in the work will be completed, the onside superior must notify management. All revisions and or amendments to the ECSP and or site-specific work procedures must be sent to the office. The office upon receipt of the revisions will make the necessary changes to ECP and or site-specific work procedures, and provide a revised copy to the
Site Supervisor.

Managers and Senior Electricians will hold a safety meeting/tool box with all workers, subtrade personnel and or authorized visitors for the purpose of informing them of all changes made to the ECP and or site-specific work procedures, prior to beginning work. The site supervisor and or foreman will ensure that any additional equipment that may be required as a result of changes to the ECP and or work procedures is on site.

In the event the office is closed (weekends), the foreman or supervisor can make the necessary changes to this document on site. Ensure that the hand-revised copies are then sent to the office. Approval to proceed with the revised work process must be obtained from 0720485 BC Ltd. Project Manager or Safety officer, prior to beginning work.

2. Silica

2.1 Health Hazards from Silica Exposure

Long-term exposure to airborne crystalline silica (for example, quartz) can cause a disabling, sometimes fatal lung disease called silicosis as well exposure to crystalline silica has been linked to lung cancer.

When the dust is inhaled deep into the lungs, microscopic particles of silica can cause scar tissue to form in the lung tissue, which restricts the lungs' ability to extract oxygen from the air. This damage is permanent, but symptoms of the disease may not appear for many years. The disease initially causes fatigue and shortness of breath. If exposure continues, it can lead to chest pain, heart problems (difficulty breathing can strain the heart), and respiratory failure. Exposure to crystalline silica has also been linked to other diseases, including bronchitis and tuberculosis.

2.2 Silicosis

2.2.1 Chronic Silicosis

Chronic silicosis is most common. Symptoms may not appear for a long time, usually more than 10 years, and may progress and worsen over a period of many years. Chronic silicosis may be either a simple or a complicated type.

The effects of silicosis can continue to develop even after the exposure ceases and they are irreversible. In addition, the progression of lung fibrosis can also lead to the development of lung cancer

2.2.2 Accelerated Silicosis

Accelerated silicosis is almost the same as chronic silicosis. However, it develops more quickly and the lung scars show up sooner. Accelerated silicosis can develop when exposure to large amounts of silica dust occurs over a short time period. Nodules may appear on a chest x-ray five year after the first exposure to silica dust and the disease can quickly worsen.

2.2.3 Acute Silicosis

Acute silicosis is a lung disease that develops rapidly. As few as 8 to 18 months may elapse from the time of first exposure to the onset of symptoms, which include progressive shortness of breath, fever, cough and weight loss. There is a rapid progression of respiratory failure usually resulting in death within one or two years.

2.3 Purpose and Responsibilities

- 0720485 BC Ltd. has a duty to protect our workers from silica exposure during concrete drilling. Studies show that concrete drilling generates airborne silica levels well in excess of safe levels. Effective controls are available to protect workers from harmful exposure.
- A combination of control measures will be required to achieve this objective. We commit to being diligent in our efforts to select the most effective control technologies available, and to ensure that the best practices, as described in this exposure control plan (ECP), are followed at our worksites.
- The work procedures we establish for concrete drilling will protect not only our workers but also any other workers on-site who are not involved in these operations.

2.3.1 The Employer is Responsible for the following

- Ensure that the materials (for example, tools, equipment, and personal protective equipment PPE) and other resources (for example, worker training) required to fully implement and maintain this ECP are readily available.
- Ensure that supervisors and workers are educated in the hazards of silica exposure and trained to work safely with silica.
- Maintain written records of training (for example, proper use of respirators), fit-test results, crew talks, and inspections (for equipment, PPE, and work methods and practices).
- Conduct an annual review (or more often if conditions change) of the effectiveness of the ECP. This includes a review of available dust control technologies to ensure these are selected and used when practical.
- Coordinate work with the prime contractor and other employers to ensure a safe work environment.

2.3.2 Supervisors are Responsible for the following

- Provide adequate instruction to workers on the hazards of silica associated with concrete drilling.
- Select and implement the appropriate control measures.
- Ensure that workers using respirators have been properly trained and fit-tested and that the results are recorded.
- Ensure that work is conducted in a manner that minimizes and adequately controls the risk to workers and others. This includes ensuring that workers use appropriate engineering controls and wear the necessary PPE.

2.3.3 Workers are Responsible for the following

- Use the assigned protective equipment in an effective and safe manner.
- Follow established work procedures as directed by the supervisor.
- Report any unsafe conditions or acts to the supervisor.
- Report to the employer any exposure incidents or any signs or symptoms of silica illness.

2.4 Risk Identification and Assessment

- Concrete can contain a high percentage of silica.
- Drilling concrete without the use of proper dust controls and PPE can expose workers to levels of airborne respirable crystalline silica that are above the exposure limit listed in the Regulation.
- Work locations where workers or other persons are exposed to the hazards of silica will be identified with signs, placards, or barrier tape.
- The occupational exposure limit (OEL) for respirable crystalline silica (including quartz) is 0.025 milligrams per cubic metre (mg/m^3) over an 8-hour period.
- Because crystalline silica is linked to lung cancer, workplace exposures must be reduced to levels that are as Low as Reasonably Achievable (ALARA) below the OEL.

2.5 Exposure Control Plan

2.5.1 Dry Powder Mixing Containing Silica

- When mixing in a portable concrete mixer, stucco mixer or a larger trailer mounted unit on location, always mix away from other people.
- If that is not possible, **Red Tape** off a work area as wide as possible (minimum 10 feet) so no other worker will be contaminated.
- Workers doing the task of mixing MUST wear a fit tested half mask with P100 filters
- Always check which way the wind is blowing and position yourself upwind of the mixer
- If concrete dust (silica) begins to billow out of the mixer spay a heavy mist of water to knock the dust down preventing release into the surrounding area and causing contamination.
- For an operation, such as pouring lightweight floor mix where a portable mixer plant on a trailer is used, a heavy misting over the open end of the mixer must be installed. Operations such as this use a vast amount of powder and mixing is ongoing through the task. Due to weather conditions, such as wind, different styles of sprayers will need to be tried until one mitigates and contains the concrete powder completely. Such methods could be multiple garden hose and spry guns mounted overhead, tubing with small micro holes drilled in and mounted on the mixer open end hooked up top a pump or continues water, a professional sprayer system installed, or even a hooded cover with a HEPA vacuum system installed.

2.5.2 Silica Dust Control

- The Regulation requires employers to select silica dust controls based on the following hierarchy:
- Engineering (for example, local exhaust ventilation, water, HEPA attachments, or dust caps)
- Administrative controls (for example, drilling when other workers are not in the area)
- Personal protective equipment (for example, respirators and disposable coveralls)
- Use of respirators as a primary control is not acceptable when other methods are available and practical.
- Respirators will be used in conjunction with other controls such as local exhaust ventilation (LEV), HEPA filter attachments, or water attachments to reduce worker exposure to silica, unless air monitoring information suggests otherwise.
- LEV, HEPA attachments, and wet drilling are the preferred engineering methods, and will be used when practicable.
- A HEPA vacuum will be used for cleanup and decontamination.

2.5.3 Acceptable control methods for concrete drilling

- The work methods in the following table are acceptable, provided that the respirator selection, dust suppression, and other controls are adhered to.
- The following control options will be used to eliminate or reduce the risk to workers from the hazards of silica dust exposure, unless air monitoring information suggests otherwise:

2.5.3.1 Control Methods for Concrete Drilling Chart

Work activity	Dust suppression	Other controls	Respirator type
Drilling a few (12 or fewer) holes in a wall or ceiling	Dust cap, HEPA attachment on drill, or HEPA vacuum extraction	Barriers (for example, a tape barrier) to restrict access to the work area	Half-face respirator with P 100 series filters
Drilling a few (12 or fewer) holes in a floor	HEPA attachment on drill or HEPA vacuum extraction	Barriers (for example, a tape barrier) to restrict access to the work area	Half-face respirator with P 100 series filters
	Continuous water spray	Barriers (for example, a tape barrier) to restrict access to the work area	N95 respirator
Drilling more than 12 holes in a wall or ceiling	Drill connected to HEPA vacuum extraction	Barriers to restrict access to the work area or a full enclosure system with negative air (depending on the size of the work area and amount of work)	Full-face respirator with P 100 series filters
Drilling more than 12 holes in a floor	Drill connected to HEPA vacuum extraction	Barriers to restrict access to the work area or full enclosure system with negative air (depending on the size of the work area and amount of work)	Full-face respirator with P 100 series filters
	Continuous water spray	Barriers (for example, a tape barrier) to restrict access to the work area	Half-face respirator with P 100 series filters
Drilling holes in a small unventilated work area where standard engineering controls are not practicable	None	Full enclosure systems (with negative air) are required to restrict access to and contain the work area	Full-face powered air-purifying respirator (PAPR) with P 100 series filters

2.6 Safe Work Planning

1) Select one or more of the methods described in the table above.
2) Establish a barrier or full enclosure (under negative pressure) around the work zone to restrict access by unprotected workers.
3) Inspect all dust control equipment and tools to make sure they are in good working order.
4) Use and maintain all tools and equipment as specified by the manufacturer. For example, test the effectiveness of HEPA filters using dioctyl phthalate (DOP) testing or similar means at least annually, and any time a HEPA filter is replaced in a vacuum cleaner or ventilation system.
5) When working on a multi-employer site, provide the general contractor with a copy of the silica exposure control plan and safe work procedures. Review the procedures and work schedule with the general contractor to determine if additional measures are required to reduce worker exposure to silica.
6) Ensure that workers inspect their respirators before start-up.
7) Visually monitor dust release from equipment during use. When tools and equipment are working properly, very little dust should be visible in the air. Stop work if excessive dust is observed.

2.7 Respiratory Protective Equipment

- Each worker will be fit tested if a respirator is required.
- The site CSO/ OFA III should be a certified fit tester so as to not hamper production. Repertory Protective Masks come in a half mask negative air style, full face mask negative and positive air style and cloth. Cloth being the last resort.
- If a worker is required to wear a respirator that requires an effective seal with the face for proper functioning, the worker must be clean shaven where the respirator seals with the face.
- When the worker notices a notable resistance to breathing, the respirator filters must be replaced.
- Respirators will be used, cleaned, and stored in accordance with the respiratory protection program or manufactures instructions.

2.8 Other Personal Protective Equipment and Hygiene

- Workers will wear approved safety glasses and hearing protection when drilling concrete. This equipment will not interfere with the fit of the worker's respirator.
- Workers will wear washable work coveralls that do not retain dust. These coveralls will be laundered and changed regularly, and workers will not wear them outside the work area. For example, workers must remove coveralls before eating lunch.
- Workers who launder clothing contaminated with silica should be informed of the hazards of silica and the precautions required for handling the clothing.
- Disposable coveralls will be used in full enclosure systems.

2.9 Housekeeping Procedures

- Dry sweeping and the use of compressed air are **prohibited** for removing dust and debris containing silica. Work areas and equipment covered by dust will be cleaned at the end of every shift using a HEPA filter vacuum.
- Wet cleanup may also be used to remove dust.
- Any slurry generated by wet control methods should be cleaned up when the work is completed to avoid secondary dust exposure hazard.
- Waste material will be placed in a dumpster, and will be removed at least weekly. The location and method used to store waste will not allow silica-containing dust to re-enter the workplace.
- Supervisors are responsible for ensuring that work areas are free from dust at the end of each shift.

2.10 Worker Training for Silica Dust Exposure

Training is an important component in preventing worker exposure to silica. Each firm has an obligation to designate a person or persons who are responsible for conducting training with regards to silica. This person is responsible to ensure all topics relating to silica are covered in sufficient detail to ensure there is a solid understanding of the hazards, risks and methods used to minimize the risk of silica dust.

- Training will be performed by the employer or the employers designate.
- Records of attendance, dates of training, and training material will be documented and additional training or reference material will be made available to employees upon request.

2.10.1 Training Topics

- Health hazards of silica dust exposure (including signs and symptoms of silicosis)
- Operations and materials that can produce silica dust exposures
- Engineering controls and safe work practices used to protect workers
- The importance of proper equipment
- Workers who are regularly exposed to silica dust will receive regular medical examinations from their family physicians. These examinations may include chest X-rays.
- Workers will report any symptoms of silica exposure to the employer and WorkSafe BC for tracking and investigation.

Maximum Exposure of Crystalline Silica

0.025 mg in a M^3 of air over an 8-hour Time-Weighted Average (TWA)

Handle Crystalline Silica as if you were handling Asbestos.

3. Lead

Lead is one of the few natural substances that has no use in the human body. At even very low levels, lead has been shown to cause health problems. The difficulty with lead is that once it is mined from the earth, there is no known way to destroy or make it harmless. This makes it extremely important that we reduce our use of lead and dispose of it properly.

Lead primarily enters the body through ingestion or inhalation, once lead gets into the body it is absorbed and distributed throughout the body. Once lead is in the blood, some of it moves into soft tissues (organs such as the brain and kidneys). The total amount of lead that is stored in the body is called the "body burden". In adults, bones and teeth contain about 95% of the body burden. Lead that is stored in the bones can leave them and enter the blood and then the soft tissue. This can damage the organs or the blood's ability to make red blood cells. Dangerous health effects or toxic effects are usually broken into two categories - short-term (acute) or long-term (chronic), Lead can cause both acute and chronic health effects.

3.1 Lead Hazard Awareness

Lead is an ALARA substance, and workers exposure will be kept as low as reasonably possible.

Lead is a metal of high cumulative toxicity with no known biological role. Since lead disrupts essential enzyme systems mediated by metals such as calcium iron and zinc, it can produce adverse effects on virtually all body systems.

Common symptoms of overexposure include a feeling of tiredness and weakness, aches and pains, headaches, loss of weight, abdominal pain, and possible constipation. A worker who is overexposed may have only one of these complaints, or a number of them, or none. Symptoms of lead exposure may take a long time to develop. Workers with similar exposures to lead may have different symptoms, which may also vary in severity. All workers need to prevent or minimize lead exposure.

These symptoms of lead poisoning can often be subtle and non-specific and the condition may not be recognized or treated. Lead poisoning can occur in both acute (having a sudden onset, sharp rise, and short course) or chronic (marked by long duration or frequent recurrence) form.

Possible effects of lead absorption are anemia, nerve damage causing muscle weakness, kidney damage, high blood pressure, and reproductive effects in both men and women. Adverse effects may also occur to a developing fetus (such as low birth weight and developmental delays) when a mother is exposed to even fairly low levels of lead.

If a woman has been exposed to a significant amount of lead before and during pregnancy, lead may come out of the body tissues where it is stored and it may enter the blood and the fetus. Lead is also excreted in breast milk.

Children are considered at higher risk for health problems from lead exposure than adults. In addition to the health problems suffered by adults, children may also have problems with mental and physical development.

3.2 How Does Lead Get into The Body?

Lead may enter the body through ingestion, or inhalation, lead dust settles onto clothing or skin surfaces or other objects and may subsequently be transferred to the mouth.
The following are examples of how lead can enter your body:

- Breathing in lead dust or fumes.
- Drinking or eating food contaminated with lead.
- Eating or drinking from contaminated cups, bowls, etc.
- Biting your nails or smoking when your fingers are contaminated with lead.
- Putting objects contaminated with lead in your mouth (such as pens and pencils from the work area).
- Smoking or chewing gum where there is lead dust or fumes.
- Applying creams or cosmetics.

Workers that are exposed to lead accumulate the toxin first in their blood, secondly in their bones. The biological half-life of lead in the blood is considered to be 90 days.
The biological half-life of lead in the bones is considered to be 30 years.

3.3 Education and Training

Training is an important component in preventing worker exposure to lead. Control methods, policies and procedures can only be as effective as the workers carrying them out. Keep track of who was trained, when the training took place and what was included. All personnel that intend to enter a hazardous work area shall be trained by a competent person in the following procedures:

1) Hazards of lead, including health effects and symptom recognition.
2) Proper use of tools and equipment used on the project.
3) Proper utilization of appropriate respirators.
4) Proper fitting of personal protective clothing and self-checks.
5) Proper cleaning, storing or disposal of contaminated PPE.
6) Proper personal hygiene methodology, procedures and practices.
7) Emergency response procedures, duties and response.
8) Containment design, inspection, monitoring and purpose.

Training will be provided by a knowledgeable, competent person. According to regulation qualified is “being knowledgeable of the work, the hazards involved and the means to control the hazards, by reason of education, training, experience or a combination thereof.” Other notable items are:

- Be familiar with the provisions of the Alberta Occupational Health and Safety Act, Workers Compensation Act of British Columbia regulations that apply to the proposed work.
- Recognized courses in lead inspection, management, abatement as well extensive experience within the lead abatement industry.
- Will have education, training and experience in recognizing, evaluating and controlling lead hazards.

3.4 Table Of Exposure Limits WorkSafe BC Guidelines Part 5

Substance [CAS No.]	TWA	STEL / Ceiling	Notations
Lead - elemental and inorganic compounds, as Pb [7439-92-1]	0.05 mg/m^3		Elemental 2B; R Other inorganic 2A; R
Lead chromate, as Cr [7758-97-6]	0.012 mg/m^3		A2, 1; R; (I)
Lead chromate, as Pb [7758-97-6]	0.05 mg/m^3		A2, 1; R; (I)

3.4.1 Lead Based Paint

Abatement Exposure Ranges Historical Data of Typical & Maximum Exposure Levels

Operation	mg/m3 Typical	mg/m3 Maximum
Open Blasting	17.3	59.0
Blasting in Containment	25.7	59.0
Welding, Cutting, Burning	.60	28.0
Hand Scraping	.045	.167
Chemical Stripping	.011	.476
Power Tool Cleaning	.735	20.6
Enclosure Moving	.500	2.10
Miscellaneous Rehabilitation	.145	41.0

This table represents some of the monitoring data presented by OSHA in the preamble to the lead in construction standard. This data was used to place the various methods of paint disturbance into the three exposure groups.

4. Asbestos

4.1 Exposure Control Plan

4.1.1 Policy

The purpose of this section is to provide guidance to site superintendents and site safety coordinators First Aid attendants to assess the effectiveness of the controls used by sub- trades if their scope of work could potentially generate dust containing asbestos fibers.

We have a duty to protect all workers from asbestos exposure on our worksites. Studies show that construction work tasks involving the disturbance of asbestos-containing materials can generate airborne asbestos fiber levels well in excess of safe exposure levels. Effective work procedures and controls are available to protect workers from harmful exposure to asbestos.

4.2 Hazard Identification

4.2.1 Objectives

A combination of control measures is required to achieve appropriate control of all potential exposure to airborne material containing fibers of asbestos. We commit to being diligent in our efforts to select the most effective control technologies available, and to ensure that the best practices described in all ECPs be established and obeyed at all our worksites.

The work procedures we enforce will protect not only our workers but all workers and occupants on our worksites.

4.2.2 Hazard Identification

Asbestos is a generic term used to describe a group of naturally occurring fibrous minerals. These are divided based on their mineralogical properties into serpentines (“S” shaped) and amphiboles (“needle like”). The most hazardous form of asbestos are long, thin fibers that can be easily separated into small respirable fibers.

The Occupational Health and Safety Regulation defines asbestos-containing material as containing 1% or more asbestos by weight at the time of manufacture, or which contains 1% or more asbestos as determined by polarized light microscopy, electron microscopy, or gravimetric analysis.

4.3 Potential Health Effects of Asbestos

Asbestos has been recognized as a health hazard for people employed in its production and processing for centuries. However, it was not until the late nineteenth century, with the onset of the Industrial Revolution, that its use became widespread.

It was not until the early part of the twentieth century that the relationship between the use of asbestos and a variety of health effects became a source of concern to the medical profession.

Many serious, debilitating and often fatal diseases have been linked to the respiration of asbestos fibers. Although the mechanism of asbestos related diseases is still not fully understood, it is known that there is normally a long waiting (latency) period between the time of exposure and the occurrence of disease. This latency period can typically be between ten to over forty years. Asbestosis, mesothelioma and lung cancer are the diseases most commonly associated with asbestos exposure, although several other diseases have been linked to asbestos exposure.

The Ontario Royal Commission investigating the health risk of asbestos exposure concluded that the risk of contracting an asbestos related disease is negligible for building occupants or tenants but acknowledged that the risk for abatement, custodial, maintenance, outside contractor workers is higher. This is because maintenance and construction workers are more likely to come into contact with and disturb asbestos containing materials in the normal course of their work.

4.4 Responsibilities

Due to the significant risks posed by respirable asbestos fibers, it is imperative that all personnel involved in the management and overseeing of operations that could potentially create asbestos exposure take specific action to ensure a site-specific plan to minimize risk are used as well as establishing removal and disposal procedures as part of an official Asbestos Exposure Control Plan. This is a requirement under the law and is to ensure that a hazard is not created for themselves, their co-workers or the general public.

As well, no worker shall spray asbestos or install or mix any crocidolite or any mixture containing crocidolite.

4.5 Safety Equipment Required

The following PPE is required by all workers while working on site;

1. CSA approved safety boots. Boots must be in good repair.
2. CSA approved hard hat. Hard hat must be in good repair with no modifications.
3. Adequate clothing consisting of long pants and shirts with a minimum of 4" sleeves to protect from routine hazards on site.

4.5.1 Additional PPE

May be required in the form of

1. Respiratory equipment.
2. Rubber gloves.
3. Hearing protection.
4. Eye protection.
5. Any other PPE called for in the applicable MSDS.

Check with your Site Superintendent for additional PPE requirements

4.6 Preliminary Activities

Where multiple trade activity is scheduled, the general contractor is to review in advance the priority of work and schedule the appropriate time frame to allow each trade to complete their scope of work. Prior to any work commencing, Site Superintendents must conduct a hazard assessment of all applicable work areas. Any hazards that are found during the hazard assessment must be addressed prior to any work commencing.

4.6.1 Precautions in Demolition

1. Demolition of buildings or building components often encounter asbestos insulation about pipes and boilers, or asbestos in floor tiles and ceiling tiles, and PCBs are common in older fluorescent light fixture ballasts. Prior to demolition activity inspect the area for the potential of hazardous materials
2. If hazardous materials are encountered or suspected during demolition, advise the superintendent and project manager and stop work in the immediate area. Without delay, the owner and prime consultant are to be notified that work has stopped. The Project Manager or Superintendent is to formally request direction before proceeding.
3. If specified materials of new construction contain asbestos, the material is to be substituted with unequal or better material.

4.7 Handling

1. The handling of hazardous materials is to only be performed by qualified persons, specifically trained and registered to remove and dispose of hazardous materials.
2. The Ministry of Environment and any Regulatory bodies are to be notified of hazardous material on the site before the removal procedure begins.

5. Chemical & Biological

The potential for worker exposure to harmful substances like unknown chemicals and biological matter should be identified during the hazard assessment. When conducting a procedure in a manholes, drainages, or septic systems, the potential for bio matter or chemical contamination is a very real possibility. 0720485 BC Ltd. will ensure that a worker's exposure to any substance such as these are kept as low as reasonably achievable. The company will also ensure that a worker's exposure to any substance does not exceed its occupational exposure limits.

During tank cleaning procedures atmospheric testing results should be assessed before a worker is exposed. A worker may not be exposed to a substance at a concentration exceeding its ceiling limit at any time. 0720485 BC Ltd. will ensure that a worker who may be exposed to a harmful substance at a work site: is informed of the health hazards associated with exposure to that substance, is informed of measurements made of airborne concentrations of harmful substances at the work site, and is trained in procedures developed by the employer or professional organizations to minimize the workers exposure to harmful substances.

If a worker is present at a work site where chemicals harmful to the eyes or skin are used, 0720485 BC Ltd. will ensure that the worker has immediate access at the worksite to emergency baths, showers, eye wash equipment or other equipment appropriate for the potential level of exposure.

6. Respirators Program

6.1 When is Respirator Required

If a worker is or might be exposed in a workplace to an air contaminant that exceeds

(a) An 8-hour TWA limit, ceiling limit or short-term exposure limit set by ACGIH for the air contaminant,

(b) A limit that is otherwise determined by the Board under section 5.48 for the air contaminant, or

(c) A limit set by section 5.49 for the air contaminant,

The employer must provide an appropriate respirator and ensure that the worker uses an appropriate respirator in accordance with section 8.34. of the WorkSafe BC legislation.

6.2 Selection

(1) The employer, in consultation with the worker and the occupational health and safety committee, if any, or the worker health and safety representative, if any, must select an appropriate respirator in accordance with CSA Standard CAN/CSA-Z94.4-93, Selection, Use, and Care of Respirators.

(2) Only a respirator which meets the requirements of a standard acceptable to the Board may be used for protection against airborne contaminants in the workplace.

6.3 Maximum use concentration

(1) In subsection (2):

"established 8-hour TWA limit" means the 8-hour TWA limit set by the Board for an air contaminant, or if the Board has not set an 8-hour TWA limit for an air contaminant, the TWA limit set by ACGIH for the air contaminant;

"established ceiling limit" means a ceiling limit set by the Board for an air contaminant, or if the Board has not set a ceiling limit for an air contaminant, the ceiling limit set by ACGIH for the air contaminant;

"established short-term exposure limit" means the short-term exposure limit set by the Board for an air contaminant, or if the Board has not set a short-term exposure limit for an air contaminant, the short-term exposure limit set by ACGIH for the air contaminant.

(2) In subsection (3), *"maximum use concentration"* means the concentration of an air contaminant calculated in one of the following ways:

(a) If an established 8-hour TWA limit applies to the air contaminant to which a worker is or might be exposed, by multiplying

(i) The established 8-hour TWA limit for the air contaminant, and

(ii) The protection factor set out in Table 1 that applies to the respirator type that the worker is using;

(b) If there is no established 8-hour TWA limit that applies to the air contaminant to which a worker is or might be exposed, by multiplying

(i) The established short-term exposure limit for that air contaminant, and

(ii) The protection factor set out in Table 1 that applies to the respirator type that the worker is using;

(c) If there is no established 8-hour TWA limit or short-term exposure limit that applies to the air contaminant to which a worker is or might be exposed, by multiplying

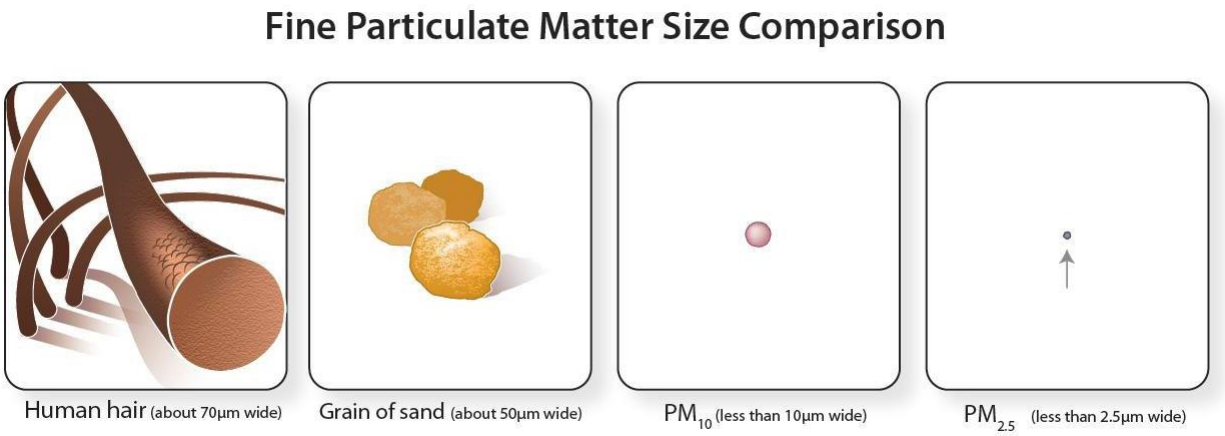
(i) The established ceiling limit for that air contaminant, and

(ii) The protection factor set out in Table 1 that applies to the respirator type that the worker is using.

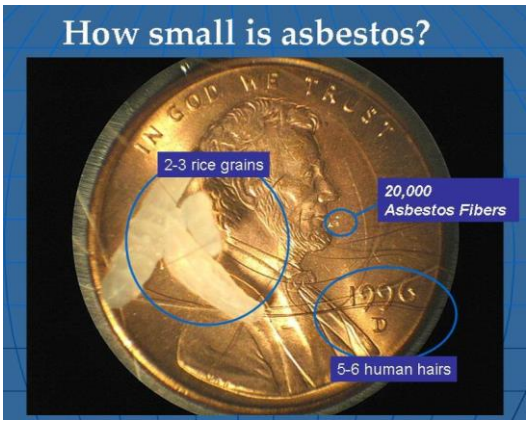
(3) The employer must ensure that a worker does not use a respirator for protection against a concentration of an air contaminant in the workplace that is greater than the maximum use concentration.

(4) The protection factor of 1 000 set out in Table 1: Respirator protection factors for a hood or helmet face piece, powered (PAPR), and equipped with a HEPA filter or a sorbent cartridge or canister or both a HEPA filter and a sorbent cartridge or canister applies only if an employer who uses or wishes to use that respirator type has evidence from the manufacturer that demonstrates that
(a) The manufacturer has tested that type of respirator, and
(b) Those tests demonstrate that a respirator of that type has a protection factor of at least 1 000.

(5) The protection factor of 25 set out in Table 1: Respirator protection factors for a hood or helmet face piece, powered (PAPR), and equipped with a HEPA filter or a sorbent cartridge or canister or both a HEPA filter and a sorbent cartridge or canister applies if the conditions set out in subsection (4) are not met.



Silica Dust is below 4µm



6.3.1 Table 1 Respirator Type

Respirator Type	Protection Factor
Air purifying	
Half face piece, non-powered	10
Full face piece, non-powered	50
Full face piece, powered (PAPR), equipped with HEPA filters for exposure to asbestos	100
Full face piece, powered (PAPR), equipped with HEPA filters and/or sorbent cartridge or canister for exposure to contaminants other than asbestos	1 000
Loose-fitting face piece, powered (PAPR)	25
Hood or helmet face piece, powered (PAPR), and equipped with a HEPA filter or a sorbent cartridge or canister or both a HEPA filter and a sorbent cartridge or canister, if section 8.34 (5) applies	25
Hood or helmet face piece, powered (PAPR), and equipped with a HEPA filter or a sorbent cartridge or canister or both a HEPA filter and a sorbent cartridge or canister, if the conditions set out in section 8.34 (4) are met	1 000
Air supplying	
Airline - demand (negative pressure)	
Half face piece	10
Full face piece	50
Airline - continuous flow	
Loose-fitting face piece/hoods	25
Half face piece	50
Full face piece	1 000
Helmet/hood	1 000
Airline - pressure demand (positive pressure)	
Half face piece	50
Full face piece	1 000
Full face piece, with egress bottle	10 000
Self-contained breathing apparatus (SCBA)	
Demand (negative pressure)	50
Pressure demand (positive pressure)	10 000
Other factors such as warning properties, IDLH levels, and cartridge/canister limitations must also be considered when determining the maximum use concentration. Refer to the manufacturer's instructions and standards acceptable to the Board for further information.	

6.4 3M 2097/07184 Filter P100 Particulate User

6.4.1 Instructions

6.4.1.1 Use For:

Solids such as those from processing minerals, coal, iron ore, cotton, flour and certain other substances. Liquid or oil-based particles from sprays that do not also emit harmful vapors. Metal fumes produced from welding, brazing, cutting and other operations involving the heating of metals. Organic vapors below the OSHA PEL or applicable government standards, whichever is lower. 3M recommended for ozone protection up to ten times the OSHA PEL.

6.4.1.2 Do Not Use For:

Gases and vapors when concentrations exceed the OSHA PEL, or applicable government standards (whichever is lower), including those present in paint spraying Sandblasting. operations, unless combined with approved chemical cartridges. This respirator filter does not supply oxygen.

6.4.2 Instructions:

1. Failure to follow all instructions and limitations on the use of filters and/or failure to wear these filters during all times of exposure can reduce respirator effectiveness and may; result in sickness or death.
2. Before occupational use of filters, a written respiratory protection program must be implemented meeting all the requirements of OSHA 29 CFR 1910. 34 such as training and fit testing and applicable OSHA substance specific standards. In Canada, CSA standard Z94.4-93 requirements must be met.
3. The particles which can be dangerous to your health include those so small you cannot see them.
4. Leave the contaminated area immediately and contact supervisor if dizziness, irritation or other distress occurs.
5. Store the filters and respirator away from contaminated areas when not in use.
6. Dispose of used product in accordance with applicable regulations.

6.4.3 Limitations:

1. These filters do not supply oxygen. Do not use in atmospheres containing less than 19.5% oxygen.
2. Do not use when concentrations of contaminants are immediately dangerous to life and health, are unknown, or when concentration exceeds ten times the permissible exposure limit (PEL) with half face piece respirators or fifty times the PEL with full face piece respirators, or according to specific OSHA standards or applicable government regulations, whichever is lower.
3. Do not alter abuse or misuse these filters and/or respirator.
4. Do not use with beards or other facial hair or other conditions that prevent a good seal between the face and the face seal of the respirator.

6.4.4 Time Use Limitations:

1. If a filter become damaged, soiled or breathing becomes difficult, leave the contaminated area and replace the filters.
2. If used in environments containing only oil aerosols, replace filters after forty hours of use or thirty days, whichever is first.
3. If used for ozone protection, replace filters in accordance with an established change schedule, or earlier if smell, taste or irritation from contaminants is detected.

6.5 Respirator Half Face Piece

User instructions for 3M TM 6100 (small), 07024 (small), 6200 (Medium), 07025 (Medium), 6300 (Large), 07026 (Large) Half Face pieces (Keep these instructions for reference)*

6.5.1 Use Instructions and Limitations

6.5.1.1 Important

Before use, the wearer must read and understand these *user instructions*. Keep these instructions for reference. This product contains no components made from natural rubber latex.

6.5.1.2 Use For:

Respiratory protection from certain airborne contaminants according to NIOSH approvals, OSHA limitations, in Canada CSA standard Z94.4 requirements, other applicable regulations and 3M instructions.

6.5.1.3 Do Not Use For:

Concentrations of contaminants which are immediately dangerous to life and health are unknown or when concentrations exceed 10 times the permissible exposure limit (PEL), when used in air-purifying mode, or according to specific OSHA standards or applicable government regulations, whichever is lower.

6.5.1.4 Use Instructions:

1. Failure to follow all instructions and limitations on the use of this respirator and/or failure to wear this respirator during all times of exposure can reduce respirator effectiveness and may result in sickness or death.
2. Before occupational use of this respirator a written respiratory protection program must be implemented meeting all the requirements of OSHA 29 CFR 1910.134 such as training and fit testing and applicable OSHA substance specific standards. In Canada, CSA standard Z94.4 requirements must be met.
3. The airborne contaminants, which can be dangerous to your health, include those that are so small you cannot see them.
4. Leave contaminated area immediately and contact supervisor if you smell or taste contaminants or if dizziness, irritation, or other distress occurs.
5. Store respirators away from contaminated area when not in use
6. Dispose of used product in accordance with applicable regulations.

6.5.1.4 Use Limitations

1. This respirator does not supply oxygen when used in air-purifying mode. Do not in atmospheres containing less than 19.5% oxygen.
2. Do not use when concentrations of contaminants are immediately dangerous to life and health, are unknown or when concentrations exceed 10 times the permissible exposure limit (PEL) when used in air-purifying mode, or according to specific OSHA standards or applicable government regulations, whichever is lower.
3. Do not alter abuse or misuse this respirator.
4. Do not use with beards or other facial hair or other conditions that prevent a good seal between the face and the face seal of the respirator.

6.5.1.5 Time Use Limitations

1. If respirator becomes damaged, leave contaminated area immediately and repair or replace the respirator.
2. Replace the respirator in accordance with the filter Time Use Limitations.
3. Replace cartridges in accordance with an established change schedule or earlier if smell, taste or irritation from contaminants is detected.

6.5.2 NIOSH Cautions and Limitations

1. The following restrictions may apply. See NIOSH approval label.
2. Not for use in atmospheres containing less than 19.5 percent oxygen.
3. Not for use in atmospheres immediately dangerous to life or health.
4. Do not exceed maximum use concentrations established by regulatory standards.
5. Air-line respirators can be used when the respirators are supplied with respirable air meeting the requirements of CGA G-7.1 Grade D or higher quality.
6. Use only the pressure ranges and hose lengths specified in the User's Instructions.
7. If airflow is cut off, switch to filter and/or cartridge or canister and immediately exit to clean air.
8. Follow established cartridge and canister change schedules or observe ESLI to ensure that cartridge and canisters are replaced before breakthrough occurs
9. Contains electrical parts which have not been evaluated as an ignition source in flammable or explosive by MSHA/NIOSH.
10. Failure to properly use and maintain this product could result in injury or death.
11. The Occupational Safety and Health Administration regulations require gas- proof goggles to be worn with this respirator when used against formaldehyde.
12. Follow the manufacturer's User's Instructions for changing cartridges, canisters and/or filters.
13. All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations.
14. Never substitute, modify, add, or omit parts. Use only exact replacement parts in the configuration as specified by the manufacturer.
15. Refer to User's Instructions, and/or maintenance manuals for information on use and maintenance of these respirators.
16. NIOSH does not evaluate respirators for use as surgical masks.
17. Special or critical User's Instructions and/or specific use limitations apply. Refer to User's Instructions before donning.

6.5.3 S- Special or Critical Use Instructions

3M™ Mercury Vapor Cartridges (6009 and 60929) are equipped with passive 3M™ End of Service Life Indicators (ESLI). The color change indicator must be readily visible when wearing the respirator without manipulation. If you cannot readily see the ESLI, do not use. Mercury vapor cartridges must be discarded when the ESLI changes color; or within 30 days of opening packaging; or when ESLI becomes dirty or damaged; or when odors of vapors or gases become noticeable, whichever occurs first. Mercury vapor has no odor.

To assemble 3M™ Dual Airline Combination Breathing Tubes with 3M™ Cartridges/Filters, the face piece inhalation valves must be removed.

If the face piece is to be used in air purifying mode (without using the 3M SA-1600 or SA-2600 breathing tubes), the inhalation valves must be replaced in the face piece before use.

6.6 Chemical Cartridges and Filters

6.6.1 Service Life

6000 series cartridges should be used before the expiration date on cartridge packaging. The useful life of these cartridges will depend upon activity of wearer (breathing rate), specific type, volatility and concentration of contaminants and environmental conditions such as humidity, pressure, and temperature. Cartridges
must be replaced in accordance with an established change schedule or earlier if small, taste or irritation from contaminants is detected.

Filters must be replaced if they become damaged, soiled or if increased breathing resistance occurs. N-series should not be used in environments containing oils. R- series filters may be limited to 8 hours of continuous or intermittent use if oil aerosols are present. In environments containing only oil aerosols, P-series filters should be replaced after 40 hours of use or 30 days, whichever is first.

6.6.2 Assembly Instructions 3M™

6.6.2.1 6000 Series Cartridges Assembly

1. Align cartridge notch with face piece mark, as shown, and push together.
2. Turn cartridge clockwise to stop (1/4 turn).

6.6.2.2 5N11 and 5P71 Filters

1. Place filter into 501 retainers, so printer side of filter faces the cartridge.
2. Press cartridge into filter retainer. It should snap securely into filter retainer. When correctly installed, filter should completely cover face of cartridge.
3. To replace filter, remove retainer by lifting on tab.

6.6.2.3 2000 Series Filter Assembly

1. Align opening of filter with filter attachment on face piece.
2. Turn filter clockwise until it is firmly seated and cannot be further turned.
3. Repeat for second filter.

6.6.2.4 502 Adapter Assembly

1. Align adapter over cartridge. Engage front snap by squeezing front of cartridge and adapter together, placing thumbs of both hands over top of adapter and fingers along bottom sides of cartridge.
2. Engage back snap by squeezing back side of cartridge and adapter together using the same hand positions. An audible click should be heard as each snap is engaged.

Note:
The 3M 502 adapter should not be removed or reused once engaged as it is not designed for reuse and leakage may occur.

6.6.2.5 2000 Series Filters/502 Adapter Assembly

1. Place filter onto the filter holder so that the filter comes into even contact with gasket.
2. Twist clockwise a quarter turn until it is firmly seated and filter cannot be turned further.
3. Repeat for second filter.

6.6.2.6 Assembly of Dual Airline Breathing Tubes

1. Hold the face piece in front of you so that the 3M logo is facing you. Align the two branches of the breathing tube over the two bayonet mounts on face piece. For the 3M™ SA-1500 or SA-1600 Breathing Tubes, make sure that 3M logo on breathing tube and on half face piece are both facing towards you. For 3M SA-2500 OR SA-2600 Breathing Tubes, make sure that the 3M logo on breathing tube is facing in opposite direction to 3M logo on half face pieces. 3M SA-1500/SA-2500 shown.
2. Twist each branch of breathing tube clockwise a quarter turn until it is firmly seated in the bayonet and cannot be turned further. Do not forcibly overturn as the bayonet could be damaged. 3M SA-1500/SA-2500 shown.
3. Attach airline to approved air regulators per pressure schedules in dual airline operator's manual.

6.6.3 Assembly of 3M Combination Dual Airline Breathing

6.6.3.1 Tubes with Cartridges and/or Filters

The 3M SA-1600 (front-mounted) and SA-2600 (back-mounted) versions of the 3M dual airline breathing tubes allow use of selected, NIOSH-approved 3M 6000 series cartridges and 2000 series filters. For listing of approved cartridges and filters, reference NIOSH approval label included with 3M dual airline breathing tubes.

1. To assemble 3M dual airline breathing tubes with cartridges and/or filters, do the following:
2. Remove inhalation valves from face piece and store them so they remain flat.
3. Attach 3M SA-1600 OR SA-2600 breathing tubes to face piece per the procedures outlined previously. The procedure is identical to the 3M SA-1500 and SA-2500 models.
4. Select cartridges and/or filters that meets your respiratory protection requirements, and attach to outer bayonets of 3M-1600 or SA-2600 breathing tubes.
5. Don face piece per procedures outlined in Donning Respirator Instructions.
6. After being properly fit tested, perform a positive and negative pressure user seal check per procedures outlined in the User Seal Check Instructions.
7. **If you cannot achieve a proper fit, do not enter the contaminated area. See your**
8. **supervisor.**
9. Attach airline to approved air regulators per pressure schedules in dual airline operator's
10. manual.

Using the 3M Combination Dual Airline Breathing Tubes without Cartridges or Filters

To use the 3M SA 1600 or SA-2600 breathing tubes without cartridges or filters, attach a 3M™ 6880 Bayonet Cap to each outer bayonet mount on the breathing tube. When used as a straight, Type C, Continuous flow supplied air respirator, the Assigned Protection Factor is 50 times the PEL or TLV guidelines for the half face piece respirators.

6.7 Fitting Instructions

Must be followed each time respirator is worn.

6.7.1 Donning Respirator

1. Place respirator over your mouth and nose, then pull head harness over crown of your head.
2. Take bottom straps in both hands, place them in back of your neck, and hook them together.
3. Position face piece low on the bridge of your nose for optimal visibility and best fit.
4. Adjust straps first, then lower neck straps by pulling on ends. DO NOT pull too tight! (Strap tension may be decreased by pushing out on back side of buckles.) Perform a positive pressure and/or negative pressure user seal check. The positive pressure method is recommended.

If you cannot achieve a proper fit, do not enter contaminated area. See your supervisor.

6.7.2 User Seal Checks

Always check the seal of the respirator on your face before entering a contaminated area.

6.7.2.1 Positive Pressure Seal Check

1. Place the palm of your hand over the exhalation valve cover and exhale gently. If face piece bulges slightly and no air leaks are detected between your face and the face piece, a proper fit has been obtained.
2. If face seal air leakage is detected, reposition respirator on your face and/or readjust tension of the elastic straps to eliminate leakage.
3. Repeat above steps until a tight face seal is obtained.

If you cannot achieve a proper fit, do not enter contaminated area. See your supervisor.

6.7.2.2 Negative Pressure Seal check **(with 6000 series cartridges)**

1. Place your thumbs into the center portion of the filters, restricting airflow into the breathing tube of filters, and inhale gently. If you feel face piece collapse slightly and pull closer to your face with no leaks between the face and face piece, a proper fit has been obtained.
2. If face seal air leakage is detected, reposition respirator on face and/or readjust tension of straps to eliminate the leakage.
3. Repeat above steps until a tight face seal is obtained.

If you cannot achieve a proper seal, do not enter contaminated area. See your supervisor.

6.7.3 Fit Testing

The effectiveness of a respirator will be reduced if it is not fitted properly. Therefore, either quantitative or qualitative fit testing must be conducted prior to the respirator being issued.

Note: Fit testing is a U.S. Occupational Safety and Health Administration (OSHA) and Canadian CSA requirement. The effectiveness of a respirator will be reduced if it is not fitted properly. Therefore, either quantitative or qualitative fit testing must be conducted prior to the respirator being issued and used.

6.7.3.1 Quantitative Fit Testing

Quantitative Fit Testing (QNFT) can be conducted using a 3M™ 601 Fit Test Adapter and P100 filters such as the 3M™ 2091 or 7093 Particulate Filters.

Quantitative Fit Testing (QNFT) with the 3M™ FT-10 or FT-30 or Qualitative Fit Test Apparatus can be conducted using any of the NIOSH approved particulate filters.

Note: For further information concerning fit testing, contact 3M OH&S Technical Services At 1-800-243-4630 or a 3M location in your region. In Canada call Technical Service at 1-800-267-4414.

6.7.4 Inspection Cleaning and Storage

6.7.4.1 Inspection Procedure

The 3M 6000 series face piece must be inspected before each use to ensure that it is in good operating condition. The face piece should be repaired or disposed of upon observation of damaged or defective parts. The following inspection procedure is suggested.

1. Check face piece for cracks, tears or dirt. Be certain face piece, especially face seal area, is not distorted.
2. Examine inhalation valves for signs of distortion, cracking or tearing.
3. Make sure that the head straps are intact and have good elasticity.
4. Examine all plastic parts for signs of cracking or fatiguing. Make sure filter gaskets are properly seated and in good condition.
5. Remove exhalation valve cover and examine exhalation valve and valve seat for signs of dirt, distortion, cracking or tearing. Replace exhalation valve cover.

67.4.2 Clean and Storage

Caution: Cleaning with solvents may degrade some respirator components and reduce respirator effectiveness. Inspect all respirator components before each use to ensure proper operating condition.

6.7.4.3 Cleaning is recommended after each use

1. Remove cartridges and/or filters
2. Clean face piece (excluding filters and cartridges), with 3M™ 504 Respirator Wipes (not to be used as the only method of cleaning) or by immersing in warm cleaning solution, water temperature not to exceed 120*F, and scrub with soft brush until clean. Add neutral detergent if necessary. Do not use cleaners containing lanolin or other oils.
3. Disinfect face piece by soaking in a solution of quintenary ammonia disinfectant or sodium hypochlorite (1 oz. [30 ml] household bleach in 2 gallons [7.5L] of water), or other disinfectant.
4. Rinse in fresh, warm water and air dry in non-contaminated atmosphere.
5. The cleaned respirator should be stored away from contaminated areas when not in use

7. Definitions

ACGIH	American Conference of Governmental Industrial Hygienists
APR	Air Purifying Respirator
CSA	Canadian Standards Association
DOP Testing	DOP or Dioctyl Phthalate is an aerosol that is used to test HEPA filters and the seal of the filter to the housing of a vacuum or negative air unit. It is recommended that this testing occur at least yearly.
ECP	Exposure Control Plan. A term referenced in WorkSafe BC legislation
Exposure Level	the maximum allowable exposure to a chemical or other agent or hazard. It is often expressed as an average over eight hours or 15 minutes or as a ceiling above which no exposure is permitted at any time. Exposures longer than eight hours are often adjusted to account for extended exposure and reduced recovery time. Exposure levels can also be referred to as occupational exposure levels (OEL) or permissible exposure levels (PEL).
Heavy Metals	general a term used to describe metals with high atomic weights that are very toxic such as mercury, cadmium, lead, arsenic, manganese, chromium, etc.
IARC	International Agency for Research on Cancer
Mist	the presence of liquid droplets suspended in the air
(M)SDS	Material Safety Data Sheet or Safety Data Sheet
NIOSH	National Institute of Occupational Safety and Health – a federal department of the Centre for Disease (CDC) Control in the United States of America. NIOSH is responsible for conducting research and making recommendations for the prevention of work-related disease and injury.
NORM	Naturally occurring radioactive materials. These are typically decay products of thorium and uranium such as radium-226, radium-228, radon-222 and lead-210. NORM may be concentrated in oil and gas process equipment in the form of gas, sludge, scales and films. Certain products such as refractory brick insulation may naturally contain NORM.
PAPR	Powered Air Purifying Respirator. A respirator that is equipped with a filter and a blower motor such that a slight positive pressure within the face piece is created. PAPR's can be either tight-fitting or loose-fitting.

Respirable Delineates a specific size of airborne contaminant that is capable of accessing the lower regions of the lung where gas exchange takes place. A variety of definitions exist but in general airborne particulate that has a diameter of less than 10 micrometers is regarded as respirable.

Spirometry tests that measure pulmonary lung function (PFT) in order to diagnose a variety of lung diseases. Often includes the forced vital capacity (FEV) and forced expiratory volume in one second FEV(1) tests