

ASBESTOS MANAGEMENT PROGRAM

FOR

**SCHOOL BOARD #37
DELTA, B.C.**

**FOR PROPERTIES UNDER THE CONTROL,
OCCUPANCY, OR ADMINISTRATION OF THE
DELTA SCHOOL BOARD #37**

PREPARED FOR:

**Delta School Board #37
Maintenance Facility
7186 Brown Street
Delta, B.C.
V4G 1G8**

PREPARED BY:

**ACM ENVIRONMENTAL CORPORATION
#217 - 2323 Quebec Street
Vancouver, BC
V5T 4S7**

January 2006

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1.0 INTRODUCTION

Delta School Board #37 (**DSB**) commissioned A.C.M. Environmental Corporation to develop a comprehensive Asbestos Management Program (**AMP**) for all properties under the control, occupancy, or administration of the DSB.

The growing concern for inherent health risks associated with asbestos containing materials initiated the development of the AMP document to ensure a safe environment for all DSB employees, students, contractors, and visiting public.

This AMP document details information and procedures to provide a safe environment during the management of asbestos containing materials within the DSB buildings. It is intended to be an active document that will require modification and updating, as conditions and regulations change, in order to maintain the safe environment.

This AMP document takes into consideration current policy, practices, regulations, and guidelines in accordance with the management of asbestos containing materials.

The Workers' Compensation Board of British Columbia – Section 5.54 - Exposure Control Plan regulation requirements are incorporated into this AMP document to provide further control to ensure worker safety through continued maintenance of this document.

An Asbestos Management Indexing system (**AMI**) format and example are included in this AMP document to provide the DSB with information as to how the asbestos material condition and associated risk level is determined for all asbestos materials at DSB. The AMI will also provide index numbers for all materials identified in the surveys to assist the DSB in developing a priority based action plan for dealing with all asbestos materials as required.

The completion of the Hazardous Materials Survey reports (standalone documents) for all DSB facilities will provide current condition and risks associated with all suspect asbestos materials within the DSB. The Hazardous Materials Survey reports will reference the AMI format in order to identify the risk level and management index number for the priority based action plan.

The DSB personnel will not perform any actual work involving asbestos abatement. However, should potential asbestos contamination occur, the DSB personnel (maintenance only) will isolate the area in question until trained outside forces take over.

All asbestos abatement will be performed by trained outside forces. Individual sections in this document may be copied and provided for various tasks for abatement projects as required.

2.0 AMP STATEMENT OF RESPONSIBILITY AND PURPOSE

The purpose of this AMP is to provide the necessary documentation, training, and procedures for a unified approach to the control and management of asbestos containing materials.

In order to minimize the risk of an accidental asbestos fibre release and potential worker exposure if and/or when an Asbestos Containing Material (ACM) disturbance occurs, the following program objectives have been established:

- The program shall clearly establish management's intent to control any known or suspect asbestos containing materials while fulfilling the requirements of the "Exposure Control Plan" as identified in Section 5.54 of the Workers' Compensation Board of British Columbia Occupational Health and Safety Regulations.
- The program shall provide detail for the methodology to identify and evaluate all asbestos containing materials and shall identify the process of distribution of the information to all parties as required (i.e., management, planning staff, maintenance and/or custodial workers, and outside contractors).
- The program shall establish the level of training required to properly implement and manage the program, and to deal with any incidents that may occur.
- The program shall ensure that the following items are addressed and dealt with as required:
 - Repair or removal of any asbestos containing materials that are identified as being in disrepair.
 - The maintenance of all remaining asbestos containing materials in a bonded or non-friable state.
 - The control of all activities to prevent the disturbance of any asbestos containing materials, unless abatement of the materials is necessary.
 - The implementation and/or verification of proper work procedures to ensure the safe handling of asbestos containing materials during maintenance or construction work that may involve asbestos abatement.
 - The inspection and/or monitoring of all scheduled asbestos abatement projects as required.

3.0 PROPERTIES, USES AND DANGERS OF ASBESTOS

Asbestos is a mineral that is found in mountains around the world. Canada, formerly one of the largest producers of asbestos has abolished the mining of asbestos except in the province of Quebec where mining still proceeds today. The asbestos mineral requires relatively little refinement and therefore is a very efficient and cost effective material.

Of the many different types of asbestos known to exist, only 6 different forms of asbestos are known to be used in building materials. These types are identified as Chrysotile, Amosite, Crocidolite, Anthophyllite, Tremolite and Actinolite asbestos.

Asbestos fibres had approximately 3000 identified different uses in multiple industries. The asbestos mineral was desirable for several different applications because of its chemical and physical properties. Some of its desirable properties and uses were:

Table – 1 Characteristics of Asbestos

- Weave ability
- Reinforcement
- Thermal insulation
- Friction and wear resistance
- Fire retardant
- High tensile strength
- Filter action
- Resistance to acids and alkalis
- Filler
- Cohesion
- Sound insulation

Table 2 – Common Types of Asbestos Building Materials

Chrysotile	Amosite	Crocidolite
<ul style="list-style-type: none">• Pipe insulation• Duct mastic & Tape• Vinyl floor tiles• Roofing felts & mastics• Linoleum• Acoustic ceiling tiles• Black, red, green, silver and yellow mastics• Spray texture coats• Stucco• Cement pipe• Cement boards• Fire proofing materials• Duct insulation• Drywall joint compound• Spray insulation• Window Putty• Plaster	<ul style="list-style-type: none">• Pipe insulation• Acoustic ceiling tiles• Fire proofing materials• Drywall joint compound• Cement pipe• Cement boards	<ul style="list-style-type: none">• Pipe insulation• Fire proofing materials• Cement pipe• Cement boards

Asbestos containing materials are broadly categorized into two groups identified as friable and non-friable.

Friable materials are defined as materials that when they are dry, can easily be pulverized or crushed by hand, allowing the powder to enter the air stream. Examples of friable materials include spray insulation, textured acoustic materials and some thermal pipe insulation.

Non-friable materials generally are less susceptible to asbestos fibre release into the air stream. Examples of non-friable materials are cement products, felts, cloths, floor and roof coverings, friction products, and ceiling tiles.

The use of friable Asbestos Containing Materials (ACMs) has been banned since 1978. Current regulations permit the use of manufactured ACMs when no superior or equal non-ACMs exist.

The hazard associated with asbestos is solely concentrated in the respiratory system that can cause early death. The chronic inhalation of asbestos fibres has been known to cause various respiratory diseases. Some known diseases are: Asbestosis, Mesothelioma, and Lung Cancer. The apparent health hazard of asbestos has caused the manufacture of asbestos products to be outlawed across Canada except in the province of Quebec.

Employees and the public can be at risk from the effects of airborne asbestos fibres. Certain size and shape fibres are considered to be carcinogenic to humans. Airborne asbestos fibres affect people by entering the respiratory system through inhalation. Asbestos fibres can be very small and therefore can evade the protective mechanisms of the nose and upper respiratory system to become lodged and accumulate in the lungs.

4.0 ELEMENTS OF THE ASBESTOS MANAGEMENT PROGRAM (AMP)

The maintenance of a safe environment for the employees and visitors of DSB is dependent on the effective management of the Asbestos Management Program. The following measures shall be incorporated into the program to ensure safety and proper control of all asbestos containing materials.

- 4.1 The development of a written plan.
- 4.2 The appointment of an AMP coordinator to manage the program and coordinate any asbestos abatement project as required. The coordinator will also deal with any emergencies should they arise.
- 4.3 The surveying of all facilities for the DSB. Surveying to include the mapping of all asbestos locations and the incorporation of the asbestos materials inventory, into the AMI.
- 4.4 Establishing training protocols for all maintenance personnel and the appropriate management personnel involved in the maintenance of the facilities.
- 4.5 Establishing parameters for building inspection (damage recognition) and air monitoring (if required).
- 4.6 Develop a criteria for all submittals required for asbestos abatement, accidents, or incidents.
- 4.7 Develop and implement an identification program for all asbestos containing materials identified in the buildings.
- 4.8 Develop and implement emergency procedures for any damage or potential exposures to asbestos.
- 4.9 Develop a criteria for the maintenance of all records involving asbestos activities and the AMP.
- 4.10 Implement personnel protection criteria for maintenance personnel and/or outside contractors that may be required to implement emergency procedures.
- 4.11 Provide protocol for outside contractors involved in asbestos abatement procedures.
- 4.12 Develop and update recommendations for dealing with asbestos containing materials with the DSB.

5.0 AMP ELEMENT DETAILS

5.1 *Initial Building Surveys For Asbestos Containing Materials*

This section presents the survey and the bulk sample analysis methodologies.

5.1.1 Asbestos Survey Methodology

The building surveys will consist of sampling of all suspect building materials found in the buildings that may contain asbestos fibres. The surveys will rely on the abilities and experience of the surveyor to gain access and identify possible asbestos containing materials.

The determination as to if the suspect material is asbestos containing will be conducted using very minor destructive testing and laboratory analysis. Limited destructive testing will consist of the removal of a small section, approximately 2 cm x 2 cm, of the suspect material.

Samples will be, when possible, taken from previously damaged locations or from locations where their removal will not be detected. Samples will be placed into plastic self-sealing sample bags and delivered to the laboratory for analysis under chain of custody procedures.

5.1.2 Bulk Sample Analysis

A.C.M. Environmental Corporation located in Vancouver, BC, will analyze the suspect asbestos containing samples using the approved laboratory procedures following the Code of Practice for the identification of asbestos bulk materials that is accepted by the Workers' Compensation Board of BC (WCB Method 0205). The method determines the content of asbestos containing materials (ACMs) by type and percent volume using a combination of polarized light microscopy, morphology, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours.

In most working environments indoor air is often 100 times more polluted than outdoor air. Therefore, it is extremely important to identify and remediate any potential pollutants that are above the expected norm for occupational atmospheres. Potential airborne asbestos fibres are one example of such a pollutant.

During the inspection of the buildings, suspect ACMs, their condition and locations will be documented and incorporated into the AMP.

5.2 Asbestos Locations

ACMs that can be found within the buildings, can exist within mechanical insulation and mastic materials, cement board materials, plaster materials, drywall materials, ceiling materials, flooring materials, HVAC duct mastic materials and roofing mastic materials, to name a few. The identified asbestos containing materials can range from <1% to 90% asbestos content.

5.3 Training Of Maintenance Personnel

5.3.1 If a possibility of disturbance of asbestos containing materials exists during maintenance or renovation work, then the following shall apply:

5.3.1.1 All personnel performing maintenance or renovation work must have undergone instruction indicating the hazards of asbestos exposure, respirator use, appropriate personal protective clothing, all aspects of the work procedures and proactive measures to limit the possibility of future exposures.

5.3.1.2 Maintenance personnel are to receive upgrade training whenever new asbestos regulations or guidelines are produced. New maintenance personnel must have a current (within the last two years)n asbestos awareness training certificate, or be trained within 6 months from the date of hiring.

5.3.2 If the maintenance or construction work is sub-contracted out, then the sub-contractor must submit forms establishing that all the sub contractor's employees having cause to enter the site, have had an asbestos orientation and instruction on the hazards of asbestos exposure, respirator use, appropriate protective clothing, all aspects of the work procedures and protective measures before entering the site.

5.4 Building Inspection And Air Monitoring

5.4.1 Damage Recognition - Any new damage identified shall be reported and repaired immediately. Deterioration to materials can be recognized from the following categories:

5.4.1.1 Moisture leaking through or staining ACMs.

5.4.1.2 Damage, dents, marks or scratches perforating ACMs.

5.4.1.3 Equipment or material in contact with ACMs.

5.4.1.4 Delamination of ACMs from themselves or their substrate.

5.4.2 Inspections of work areas during maintenance or renovation projects shall be conducted on a daily basis and immediately following the completion of the project by a qualified individual. The inspection reports shall be kept in the asbestos abatement binder on site.

5.4.3 Air Monitoring - Air monitoring shall be conducted during all high risk asbestos abatement. When the abatement is complete, but before reoccupation of the area, air clearance sampling will be conducted. Air monitoring procedure 0201, acceptable to the Workers' Compensation Board of BC (WCB), will be used to obtain air sampling results. Results of air sampling shall be kept in the asbestos abatement binder on site and be made available to all employees upon request.

5.5 Submittals

5.5.1 If the possibility for disturbance of asbestos containing materials exists during maintenance or renovation work, site specific, written safe work procedures, detailing specific steps to be followed, must be posted in a clean area on site. Asbestos containing materials shall be removed and disposed of in accordance with the municipal, provincial and federal regulatory requirements.

5.5.2 All contaminated asbestos waste removed from the building will be disposed of to an authorized landfill site in accordance with the municipal, provincial and federal regulatory requirements.

5.5.3 It will be the responsibility of the asbestos removal contractor to adhere to all applicable Transportation of Dangerous Goods Act Regulations and Waste Management Act Regulations.

5.5.4 A Notice of Project (N.O.P.) with the site-specific work procedures must be forwarded to the Workers' Compensation Board of British Columbia 24 hours before the start of any asbestos containing material abatement.

5.6 Identification Program

5.6.1 Asbestos Containing Materials Identification System will be developed for the asbestos containing materials identified in the surveys. The ID system will identify all asbestos containing materials through the use of a coded

labelling system that will be provided to the maintenance personnel and management.

IF YOU ARE UNABLE TO UNDERSTAND THE ASBESTOS IDENTIFICATION SYSTEM, CONSULT YOUR SUPERVISOR!

5.7 Emergency Procedures

5.7.1 In the event that a disturbance of asbestos occurs, employees are to immediately leave the area and contact their supervisor at once. If the disturbance is small, less than 250cc or one cup, prior to entering the contaminated area, qualified maintenance employees will:

5.7.1.1 Don HEPA equipped air purifying respirator (must be individually fit-tested) and fibre impermeable disposable clothing

5.7.1.2 Mist the disturbed insulation and surrounding air with a fine water mist

5.7.1.3 Once the area is saturated, clean up the asbestos contaminated materials in accordance to detailed work procedure. **DO NOT DRY SWEEP, BLOW, OR SPRAY ANY CONTAMINATED MATERIALS.**

5.7.1.4 Decontamination and clean-up procedures must be completed in accordance with safe work procedures and all regulatory requirements.

5.7.1.5 **NOTE:** The respirator is the first piece of equipment to be put on and the last to be taken off.

5.7.2 Should a larger delamination of asbestos containing material occur (greater than 250 cc), a reputable asbestos abatement contractor must be contacted to complete the abatement.

Table 3 - Emergency Contractor List

Contractor Name	Emergency 24 hour Phone Number

5.8 *Implementation of Inspections*

- 5.8.1 An inspection of the suspect ACMs is to be performed yearly by qualified maintenance personnel. Inspection reports are to be reviewed annually by the person responsible for the Asbestos Management Program and/or a reputable asbestos consulting firm until such time that full abatement of all ACMs in the buildings is completed.
- 5.8.2 Qualified maintenance personnel shall conduct inspections and assessments of the material condition remaining throughout the facilities.
- 5.8.3 Once per year, the employee assigned to conduct the assessment must detail the condition of material and highlight any areas requiring immediate attention. A photographic log is recommended to be included to supplement the assessment in documenting visual records of material condition. An Asbestos Exposure Control Plan Inspection Checklist is provided in Appendix C.
- 5.8.4 Detailed inventory of all material and condition changes due to maintenance work (completed by internal staff or outside contractors) must be kept indefinitely.
- 5.8.5 Each entry into work areas that involves friable or damaged ACMs, or when a potential for ACMs disturbance exists, must be documented, detailing the event, and the condition of the ACMs. Any work that caused a disturbance must be recorded detailing date, position of disturbance, and any remedial actions. Documentation should indicated on Asbestos Containing Room Entry Form. A copy of an Asbestos Containing Room Entry Form is included in Appendix D. Every room having the potential of, or asbestos disturbance should have such a form posted in a visible location on the inside of the room.

5.9 *Maintenance of Records*

Records of site inspections must be kept on site and reviewed annually by the person responsible for the Asbestos Management Program.

5.10 *Personnel Protection*

IT IS YOUR HEALTH - PROTECT IT

If an employee is unsure of the safety procedures for working near asbestos, contact your supervisor immediately.

- 5.10.1 Each worker performing maintenance duties near asbestos containing materials must have a full understanding of the safe work procedures involved in working around ACMs.
- 5.10.2 Any employee working adjacent to areas that are known to contain asbestos shall wear appropriate and approved personal protective equipment when:
- 5.10.1.1 There is potential or will be a disturbance of asbestos containing materials due to the work being performed.
 - 5.10.1.2 If there is suspect asbestos contaminated dust and debris in the work area before work commences.
- 5.10.3 The personal protective equipment must be recognized by the WCB and/or the National Institute of Occupational Health and Safety (NIOSH). As a minimum the following equipment is to be worn in the above mentioned situations:
- 5.10.3.1 Equipment required for Low-Risk Procedures:
 - 5.10.3.1.1 Dual cartridge half face respirators with HEPA filters (NIOSH 100 Series) (recommended)
 - 5.10.3.1.2 Fibre impermeable disposable coveralls with hoods (recommended)
 - 5.10.3.1.3 HEPA equipped vacuum (recommended)
 - 5.10.3.1.4 Asbestos barrier tape (recommended)
 - 5.10.3.1.5 Pail, soap and water (recommended)
 - 5.10.3.2. Equipment required for Moderate- Risk Procedures:
 - 5.10.3.2.1 Dual cartridge half face respirators equipped with HEPA filters (NIOSH 100 Series)
 - 5.10.3.2.2 Fibre impermeable disposable coveralls with hoods
 - 5.10.3.2.3 Rubber boots or disposable fibre impermeable boot covers
 - 5.10.3.2.4 Certified HEPA equipped vacuum (recommended)
 - 5.10.3.2.5 Asbestos barrier tape, signs
 - 5.10.3.2.6 Construction grade polyethylene sheets

- 5.10.3.2.7 Pail, soap and water
- 5.10.3.2.8 Duct and/or masking tape
- 5.10.3.2.9 N.O.P., fit test, training waiver forms, and D.O.P. testing certificate of HEPA vacuum
- 5.10.3.2.10 Asbestos disposal bags
- 5.109.3.2.11 Spray bottle with water

5.10.4 Workers shall be fully protected with respirators and protective clothing at all times when the possibility of disturbing asbestos exists, this includes cleaning up suspected asbestos waste.

5.10.5 Outside the work area, workers will have a decontamination station (bucket of clean water) to wash their hands, face and respirator after working near, or cleaning up, asbestos containing or contaminated materials.

5.10.6 Workers wearing air-purifying respirators must pass a qualitative Fit Test. A Fit testing form is provided in Appendix G.

5.11 *Outside Contractors*

5.11.1 All outside contractors and service personnel must be notified in writing when their work activities have the potential to impact asbestos containing materials. Included in this group are electricians, plumbers, and renovation crews.

5.11.2 Such notice will permit them to adopt appropriate procedures to protect both themselves and other occupants of the building.

5.11.3 The written notice to the contractor must be signed by the contractor acknowledging receipt and understanding of responsibilities.

5.11.4 In order to sufficiently document control, record information on outside contractors in the attached "Contractor Log". The Contractor Log Sheet provides information indicating when contractors enter the room, how long they have been in the room, and the type of work that was undertaken in the room, should a disturbance of asbestos containing materials have been detected. The form is located in Appendix F.

5.11.5 In addition to the Contractor Log Sheet, a Contractor Awareness Form (Appendix G) is supplied to limit liability to DSB. This sheet requires the

contractor to certify by signature that they have been made aware of any and all asbestos containing material within the work area, and that appropriate personal protective equipment will be worn.

5.12 Recommendations

As a result of the age of the buildings in the DSB, it can be concluded that the risk of asbestos contamination does exist.

The Workers' Compensation Board of British Columbia now encourages the ALARA philosophy. The ALARA philosophy states that asbestos materials should be abated to the extent of "As Low As Reasonably Achievable". Using ALARA and the AML, a long-term schedule should be planned to completely abate the building of all ACM.

The WCB goal, through the improvements of technology and new work practices procedures, will enable employers to decrease worker exposure to zero. The abatement options below indicate the three different possibilities that can be implemented to decrease worker exposure; of the three options the WCB preference is removal, enclosure, and finally, encapsulation.

Where any renovation to the interior of the buildings disturbs any identified asbestos containing materials, the removal of that material must occur first. To prevent any release of asbestos fibres into the atmosphere within the building, the implementation of an Exposure Control Plan, with a risk assessment and possibly the removal of the asbestos containing materials must take place. The options are provided in the paragraphs below:

Removal

Total removal of the asbestos containing materials in a facility will provide a "once and for all" solution to any asbestos problem. Total removal ensures accidental damage and the resulting release of asbestos fibres into the air stream will not occur. Also, continuing inspection and documentation (Asbestos Management Program updates) of current conditions, along with documentation of air quality in the area (air monitoring), and material repairs, will no longer be required.

Enclosure

Enclosed asbestos reduces the risk of exposure to workers by erecting a physical barrier made of materials such as Gyproc™, plywood, metal, or

polyethylene sheeting to separate a friable material containing asbestos from the habitable environment.

Continuing inspection and documentation (Asbestos Management Program updates) of current conditions, along with documentation of air quality in the area (air monitoring), and material repairs, will still be required.

Encapsulation

Encapsulation is a process in which a friable material containing asbestos is treated with a product that penetrates the material and binds all the fibres together.

Continuing inspection and documentation (Asbestos Management Program updates) of current conditions, along with documentation of air quality in the area (air monitoring), and material repairs, will still be required.

Asbestos Management Program

Should asbestos containing materials remain in the buildings, the implementation of the Asbestos Management Program for asbestos containing materials within those buildings must be followed. The recommended Asbestos Management Program elements and details can be found in Sections 4.0 and 5.0.

APPENDIX A
ASBESTOS MAINTENANCE INDEXING SYSTEM

ASBESTOS MAINTENANCE INDEXING SYSTEM

INTRODUCTION

The asbestos maintenance indexing system was developed by A.C.M. Environmental Corporation to assist owners, managers, maintenance personnel and asbestos abatement contractors in prioritizing existing hazards that require abatement. Similar systems are currently in use throughout Canada and the United States for multiple building settings for large industrial, commercial, and institutional sites.

MAINTENANCE INDEX NUMBER

The purpose of the Maintenance Indexing Number is to provide asbestos management information. The maintenance index identifies the degree of hazard by providing a value to a location. This value is derived from six separate criteria. The criteria takes into consideration **condition, accessibility, friability, dilution factor, fibre generating mechanisms, and material type.**

Every criterion is given a weighting factor according to its significance. Each criterion is divided into clearly defined sub-classifications. The sub-classifications are then numbered depending on the degree of hazard. The sub-classification number is multiplied by the weighting factor yielding a total number indicating the degree hazard. The totalling of the 6 criteria assigns each area an indexing number. The indexing numbers can be arranged into descending order (priority index) where priority is determined by the highest number value.

The survey places a strong emphasis as to whether a material is friable or non-friable. Friable asbestos products are determined by their ability to crumble and dislodge fibres from the binding material when only applying hand pressure. Non-friable asbestos products do not crumble or dislodge fibres from the binding material when using hand pressure.

Assessed Index Level

Ranges: 0-71

<i>Condition</i>	<u>Weight = 5</u>
Good - original, like new	0
Fair - edges fraying, signs of small tears	1
Poor - tears, exposed asbestos, bits of debris	3
Bad - tears, broken or damaged, > 1 sq. ft debris	4
Deplorable - severe delamination and/or deterioration	5
Possible score (0 - 25)	

<i>Accessibility</i>	<u>Weight = 4</u>
Not readily - use of ladder or staging	0
Infrequent - not normally accessed	1
Avoidable - arms length, out of the way	2
Routine - easily assessed	3
Possible score (0 -12)	

<i>Friability</i>	<u>Weight = 4</u>
No Friability	
Low Friability	1
Moderate Friability	2
High Friability	4
Possible score (0 - 16)	

<i>Dilution</i>	<u>Weight = 2</u>
Unlimited, outside	0
Limited, open areas	1
None, Contained Space	2
Possible score (0-4)	

<i>Fibre Generation Mechanisms</i>	<u>Weight = 2</u>
None	0
One	1
More than one	2
Possible score (0 -4)	

<i>Asbestos Type</i>	<u>Weight = 2</u>
None (<1%)	0
Low Chrysotile or other (1 - 30%)	1
Medium % Chrysotile & low % Amosite or Crocidolite (30 – 60%)	2
Medium % Crocidolite or Amosite (30 – 60%)	3
High % Chrysotile (60 – 100%)	4
High % Crocidolite or Amosite (60 – 100%)	5
Possible score (0 -10)	

DEFINITIONS

1. Condition

The condition factor is the most significant factor in determining the hazard posed by asbestos containing materials. The condition of an asbestos containing material determines the potential for a material to release asbestos fibres into the air stream.

The condition can either apply to a complete system or any segment. In most cases, when portions of a systems have varying conditions, the conditions are determined per area assessed and remedial action is then identified. The varying conditions are indicated in the AMI scoring under "results". The size and extent of the damage can serve as a basis for estimating the cost and priority of remedial action.

<u>Condition</u>	<u>WEIGHT = 5</u>
Good - original, like new	0
Fair - edges fraying, signs of small tears	1
Poor - tears, exposed asbestos, bits of debris	3
Bad - tears, broken or damaged, > 1 sq. ft. debris	4
Deplorable - severe delamination and/or deterioration	5
Possible score (0-25)	

Good

- i. Manufactured products showing no damage, essentially in new condition.
- ii. Piping or vessel thermal insulation that is covered with canvas or sheet metal with no holes or exposed insulation.
- iii. Spray applied asbestos material that is well adhered to the substrate and is completely covered with an encapsulant.

Fair

- i. Manufactured products showing beginning signs of damage and wear.
- ii. Piping or vessel thermal insulation that may have small areas of damaged canvas or sheet metal with no holes or exposed insulation.
- iii. Spray applied asbestos material that is well adhered to the substrate and is completely covered with an encapsulant.

Poor

- i. Manufactured products with broken pieces and/or deteriorated edges.
- ii. Piping or vessel thermal insulation that has small areas of damaged canvas or sheet metal covering with some damaged or frayed insulation.
- iii. Spray applied insulation with small damage in the form of dents or gouges.

Bad

- i. Manufactured products showing considerable breakage and deterioration.
- ii. Piping or vessel thermal insulation that has areas of damaged and/or missing sheet metal or canvas covering with exposed and damaged insulation.
- iii. Spray applied insulation showing small sections of delamination with/without water damage.

Deplorable

- i. Piping or vessel thermal insulation that has severely damaged or missing sheet metal or canvas covering with delamination damaged and exposed insulation, and debris.
- ii. Spray applied insulation where delamination and deterioration has occurred in several areas.

Note: This category does not apply to manufactured products.

ACCESSIBILITY

Accessibility is indicates the exposure potential of workers within close proximity to the asbestos containing material. Determining if workers are able to come in contact with asbestos materials we can ascertain if inadvertent contact with the materials has the potential of causing a fibre release.

This factor of the indexing system encompasses the concept of distance and frequency of possible contact.

<u>Accessibility</u>	<u>WEIGHT = 4</u>
Rarely - use of ladder or staging	0
Infrequent - not normally accessed	1
Avoidable - arms length, out of the way	2
Routine - easily accessed	3
	Possible score (0-12)

Rarely

- i. The material cannot be reached without the use of a ladder or some other aid.
- ii. Spray applied material above a suspended or false ceiling.
- iii. The insulation covered by sheet metal or canvas jacketing.

Infrequent

A material that is within reach but is infrequently accessed (i.e. remote areas, crawl spaces.)

Avoidable

Material is in an area of where contact is possible, but workers or maintenance personnel would not normally contact it during routine work. (I.e.: material within reach of operating areas.)

Routine

Material that is in a work area, and where worker contact is. (I.e. doorways with hand operated valves which are used every shift)

FRIABILITY

This category judges the material friability. Friability is a measurement of how easily a material can dislodge fibres and crumble from the binding substrate by use of hand pressure.

<u>Friability</u>	<u>WEIGHT = 4</u>
No-Friability	0
Low Friability	1
Moderate Friability	2
High Friability	4
	Possible score (0-16)

No friability

A non-friable material is a material, that cannot be broken by hand. These kinds of materials would include asbestos containing pipe insulation with a covering, Transite panels, floor tiles, Transite piping and siding.

Low friability

Materials that are considered to have low friability are materials that are in moderate to good condition. These materials would include some pipe and vessel insulation, drywall taping compounds, and spray applications with a poor encapsulant.

Moderate friability

Materials that are considered to be moderately friable usually consist of partly damaged pipe insulation, lineal pipe insulation with poor covering, partly damaged spray applications and spray applications with no encapsulant.

High friability

Materials that are considered to be highly friable are asbestos containing dusts, deteriorated spray applications, pipe insulation, and materials that are delaminating and can easily be reduced to dust.

DILUTION

Dilution of asbestos fibres into an air stream can vary greatly. More emphasis is put on the dilution if, the material in question is in an air handling system where the mixing plenum re-introduces part of the return air from a ceiling space into the building.

The dilution effect is a measure of how readily the asbestos fibres that become airborne are dispersed.

<u>Dilution</u>	<u>WEIGHT = 2</u>
Unlimited, outside	0
Limited, open areas	1
None, contained Space	2
	Possible score (0-4)

Outside, unlimited

- i. An area that has a large volume of air that has the effect of diluting airborne fibres (such as any outdoor locations).
- ii. A location with a high number of exchanges per hour (i.e. pulp mills, laboratories, fume hoods.)

Limited, open Areas

- i. An area with a fresh air supply has the effect of airborne dilution fibres.
- ii. Buildings with large unpartitioned areas (i.e.: warehouses)

None, contained Space

- i. An area with internal air recirculation that has no dilution of fibres that could become airborne.
- ii. A building or space with outgoing make up air.
- iii. Inside vessels, tanks, boilers, etc.

FIBRE GENERATING MECHANISMS

This section covers any form of mechanical or airborne action that could cause deterioration of the asbestos containing material resulting in the generation of asbestos fibres. The scoring is as follows;

<u>Fibre Generating Mechanisms</u>	<u>WEIGHT = 2</u>
------------------------------------	-------------------

No mechanisms	0
One	1
Several	2
Possible score (0-4)	

There are many examples of these mechanisms, some of which include:

Water Damage

Situations where water has caused deterioration of the asbestos containing materials creating a greater tendency for the asbestos fibres to be released.

Vibration

Situations where the insulation is being subjected to vibration from equipment, piping, or structures that has the effect of breaking up the insulation over time.

Air Disturbance

Situations where there is forced air flowing across an asbestos containing surface, which may cause a release of asbestos fibres over time. Also, the deterioration of materials due to weather elements in outdoor applications.

ASBESTOS TYPE

The type of asbestos is important as they all have different characteristics and capabilities to become airborne and therefore become a carcinogen. Chrysotile asbestos is considered the least carcinogenic to Amosite or Crocidolite due to its physical characteristics. Chrysotile is a serpentine type of fibre being more flexible than the amphibole fibre class. Amosite and Crocidolite, amphibole fibres are needle like. Crocidolite is more hazardous than Amosite due to it's consistency and fibre size.

<u>TYPE OF MATERIAL</u>	<u>WEIGHT = 2</u>
Non Asbestos (<1%)	0
Low % Chrysotile (1 - 30 %)	1
Moderate % Chrysotile or low % Amosite or Crocidolite (30 - 60 %)	2
Moderate % Amosite or Crocidolite (30 - 60 %)	3
High % Chrysotile (60-100%)	4
High % Amosite or Crocidolite (60-100%)	5
Possible Score (0 -10)	

EXAMPLE OF AMI RESULTS

The Asbestos Management Program involved an in-depth investigation of all accessed/inspected areas of the _____ facilities. Materials were sampled and/or visually examined throughout the facilities.

Any decisions regarding abatement of the asbestos containing materials must be forwarded in the form of a Notice of Project (N.O.P.) with site-specific work procedures to the Workers' Compensation Board of British Columbia 24 hours before the start of such abatement. A description and assessment, using A.C.M. Environmental Corporation's Asbestos Management Indexing System (AMI), of all identified ACMs observed within the facilities is presented below. The AMI methodology is included in Appendix A of this report.

Asbestos Containing Materials Observed

The following list describes areas which were identified as containing asbestos materials. The list also gives an Asbestos Maintenance Indexing (AMI) number where the highest numbers indicate priority areas. The list has been broken down by facility building/area and is as follows;

15. Corridors - Ceiling Texture

AMI = 23

	<u>Cond.</u>	<u>Access.</u>	<u>Friab.</u>	<u>Dil.</u>	<u>Fib.Gen.</u>	<u>Type</u>	
Score:	1	2	1	1	1	1	
Weighting:	5	4	4	2	2	2	Total
Total:	5	8	4	2	2	2	23

The corridor areas within the building have a decorative texture material applied to the ceilings which was sampled and found to contain approximately 1-10% Chrysotile asbestos. The texture materials are in good condition and covered with a layer of paint.

Maintenance Indicator = 3, 7 (Moderate, High Risk)

Action

The ceiling texture materials are in good condition and pose little or no hazard to occupants in the area provided that the material is not damaged. Any damage that may occur to the materials should be repaired by applying a coat of paint over top of the damaged areas. This would require moderate risk asbestos work procedures in accordance with applicable regulations. If the texture materials are to be removed during the future (i.e. renovation, demolition, etc.), the removal will require high risk asbestos work procedures in accordance with applicable regulations.

APPENDIX B
MODERATE RISK ASBESTOS WORK PROCEDURES
(EXAMPLE)

10.0 MODERATE RISK ASBESTOS WORK PROCEDURES

The following procedures are the minimum requirements to perform Moderate Risk Activities. All work is to be supervised by experienced and qualified personnel.

10.1 SCOPE

- 10.1.1 This specification covers all work activities including but not limited to, the removal, clean-up, disposal, handling of, or work activities in close proximity to asbestos containing materials located on the site known as _____ in _____.
- 10.1.2 All work shall be carried out according to these specifications and the moderate risk work procedures outlined in the Workers Compensation Board of British Columbia OH&S Regulation and the publication: Safe Work Practices for Handling Asbestos, 2002 Edition.

10.2 DESCRIPTION OF WORK

- 10.2.1 Work specified in this section to include working in close proximity to asbestos containing materials as well as the clean up and disposal of any asbestos containing or asbestos contaminated debris at the location outlined in section 1.1.1. Description of work on an individual basis is provided below:

Moderate Risk

- 10.2.1 Provide all labour, materials, services, insurance and equipment, in accordance with requirements of the Workers Compensation Board of British Columbia (WCB), the British Columbia Ministry of the Environment and other regulatory agencies to complete the removal and clean-up as specified of all asbestos containing materials within the allotted time frame.

10.3 SUBMITTALS AND NOTICES

Prior to Commencement of Work, The Contractor shall:

- 10.3.1 Submit completed Notice of Project, along with these site-specific work procedures to the Occupational Hygiene Section of the Worker's Compensation Board 24 hours prior to start. Post a copy of the N.O.P. on site at the base workstation.
- 10.3.2 Have on-site proof satisfactory that all permits required by any municipal, provincial, or federal agency having jurisdiction, have been attained for the project.
- 10.3.3 Ensure arrangements for transport and disposal of asbestos-containing or contaminated materials and supplies have been obtained. Ensure required manifest documentation for disposal is submitted.
- 10.3.4 Ensure written and individual signed forms, establishing that each employee entering the removal site has had instructions on hazards of asbestos exposure, on respirator use, aspects of work procedures and protective measures, are on-site. Post work procedures and Notice of Project – Asbestos visibly near the base work station of the contractor.
- 10.3.5 Post caution signs where access to the work area is possible. Such signs and asbestos barrier tape shall be located a minimum of fifteen (15) feet from any Moderate risk work areas. Caution signs shall delineate entry and protective equipment requirements and provide warning of potential health consequences of exposure to asbestos.
- 10.3.6 Submit manufacturer's specification data sheets and material safety data sheets (MSDS), for all products and materials used on this project, and as required for WHMIS compliance.

10.4 AIR MONITORING (IF REQUIRED)

- 10.4.1 From commencement of work until completion of cleaning operations, air samples shall be taken as required by the Workers' Compensation Board of British Columbia Regulations.
- 10.4.2 If air monitoring or visual inspection shows areas outside current work area enclosures to be contaminated, these areas shall be cleaned in same manner as applicable to work areas.

10.5 TEST RESULTS

- 10.5.2 Test results of air samples (if required) are available for review on-site at the asbestos removal contractor's base workstation.

10.6 SECURITY AND SUPERVISION

- 10.6.1 Work area access shall be restricted to authorized, trained, and protected personnel. Authorized personnel are limited to the owner, the contractor's employees, the Consultant (if any), and representatives of Federal and Provincial regulatory agencies having jurisdiction over the project.
- 10.6.2 During time of hazardous material handling (work at risk of dislodging asbestos-containing material) supervisory personnel shall coordinate work and take full responsibility for the co-ordination of and health and safety of all personnel working within contaminated areas.
- 10.6.3 Entry into the work area by unauthorized individuals shall be reported immediately to the supervisor.

10.7 EMERGENCY PROCEDURES

- 10.7.1 Emergency procedures shall be in written form and prominently posted by the base workstation. Employees shall be trained in evacuation procedures in the event of workplace emergencies.

10.8 PERSONNEL PROTECTION - MODERATE RISK

- 10.8.1 Provide workers with personally issued and marked respiratory equipment recognized by the WCB, the National Institute of Occupational Health and Safety (NIOSH) and the Canadian Standards Association (CSA). Half-face, Passive Air Purifying Respirators equipped with HEPA filters and disposable coveralls shall be used during all moderate risk work procedures.
- 10.8.2 Wear full-body disposable coveralls with hoods impervious to penetration by asbestos fibres, snug fitting at wrists, ankles, and hood. Wear lace less rubber boots or disposable boot covers over work boots. Immediately replace or repair said clothing if torn or damaged.
- 10.8.3 Provide eye/ear protection and hard hats as required by the O.H.& S. regulations.

- 10.8.4 A wash down area must be provided adjacent to the work area for personnel to decontaminate their hands, faces and respirators. The wash down area must provide a washbasin or sink, hot and cold or warm water, soap and waste receptacles for used filters.
- 10.8.5 Each worker and authorized visitor shall, each time he leaves the work area wet sponge gross contamination from disposable clothing, and then dispose of said clothing in the same manner as all other contaminated waste. Footwear not remaining in area for re-use must be wet sponged prior to leaving area. Still wearing respirator, each worker or authorized visitor must proceed to the wash down area provided and thoroughly clean the outside of the respirator with water, remove the respirator, thoroughly wash hands, face, and respirator with soap and water.
- 10.8.6 Workers removing waste containers from the work area shall be equipped with full-body disposable coveralls and half-face respirators with approved HEPA filter cartridges.
- 10.8.7 Workers shall not eat, drink, smoke, or chew gum or tobacco in the work area.
- 10.8.8 Workers shall be clean-shaven at the beginning of each work shift to ensure respirator to face seal is achieved.
- 10.8.9 Workers shall be fully protected with respirators and protective clothing at all times when possibility of disturbance of asbestos exists, and when handling bags of asbestos waste. Those not wearing respirators will be dismissed from the job.

MATERIALS AND EQUIPMENT

10.9 MATERIALS

- 10.9.1 Provide all materials required to complete the project according to these procedures.
- 10.9.2 Deliver all materials in the original packages, containers, or bundles, bearing the name of the manufacturer and the brand name.
- 10.9.3 Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.

- 10.9.4 Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes contaminated with asbestos shall be disposed of in accordance with the applicable regulations.

10.10 TOOLS AND EQUIPMENT

- 10.10.1 Provide all suitable tools and equipment for asbestos removal, cleanup, and disposal.
- 10.10.2 Tools and equipment shall include, but not be limited to, wire brushes, scrapers, knives, HEPA Vacuum equipment, ladders, and cleaning equipment.

10.11 SCAFFOLDING (IF REQUIRED)

- 10.11.1 Scaffolding (if required) shall be designed and constructed in accordance with CSA Standard S269.2-M1980, the Workers' Compensation Board OH&S Regulations and other applicable regulations.

EXECUTION

10.12 WORK AREA PREPARATION – MODERATE RISK

- 10.12.1 Provide evidence of project notification to the Provincial WCB.
- 10.12.2 Isolate the work area from adjacent areas, using caution tape, poly curtains **and** other means as appropriate.
- 10.12.3 Post signs, at points of entry worded as follows:

CAUTION

ASBESTOS DUST HAZARD

AUTHORIZED PERSONNEL ONLY

WEAR ASSIGNED PROTECTIVE EQUIPMENT

BREATHING ASBESTOS DUST

MAY BE HAZARDOUS TO YOUR HEALTH

Sign lettering must be bold, capitalized & sized to 50 mm.

- 10.12.4 Ensure that spray equipment, vacuum hoses, attachments, and all other required equipment is on hand within the work area prior to commencement of work.
- 10.12.5 Construct suitable scaffold platform or rolling scaffolding in the work area (if required) to allow access to the material. Scaffolding shall be designed and constructed in accordance with CSA Standard S269.2-M1980, the Worker's Compensation Board OH&S Regulations and other applicable regulations.
- 10.12.6 Place plastic drop sheets over any equipment or fixtures that may be in the work area.
- 10.12.7 Shut down, lock out, and seal off all air handling systems in the work area.
- 10.12.8 Maintain emergency and fire exits from the work areas, or establish alternative exits satisfactory to fire officials.

10.13 MODERATE RISK REMOVAL ASBESTOS CONTAINING MATERIALS

- 10.13.1 Prepare site (see Section 10.12). All work is to be conducted in full accordance with WCB – OH&S Regulations, the Moderate Risk Procedures as outlined in the WCB publication: Safe Work Practices for Handling Asbestos, 2002 Edition, and these work procedures. Follow manufacturer's recommendations with regard to material and equipment application and use.
- 10.13.2 Don protective equipment prior to next steps.
- 10.13.3 Proceed to remove the asbestos containing materials from the substrate. Place asbestos wastes into bags as it is removed, do not allow large amounts of asbestos waste to accumulate on floor of work area. Mist the materials to be removed continuously during the removal process keeping dust levels very low.
- 10.13.4 Ensure all asbestos containing or contaminated materials are placed in sealed plastic and/or bags of minimum 0.15 mm thickness. The inner bag shall be cleaned of gross contamination in the work area, sealed, and placed in clean 0.15 mm suitably labelled plastic bag and sealed prior to transfer to the asbestos storage area on site. Ensure all waste is sealed with two layers of minimum 6-mil poly.
- 10.13.5 Upon completion of asbestos abatement, clean footwear before removing from work area, or carry in sealed plastic bag to next work site where it can be used under contaminated conditions. All cloths, rags and sponges must be treated as asbestos contaminated waste and disposed of accordingly.
- 10.13.6 All equipment used in the work area shall be included in the clean up and shall be removed from work area at an appropriate time in the cleaning sequence.
- 10.13.7 Clean all surfaces including equipment and other areas that may be contaminated. Perform a visual inspection of the work area to ensure that the work area is free of visible asbestos debris.
- 10.13.8 If a visible accumulation of debris is found in the work area, HEPA vacuuming and/or wet wiping procedures shall be repeated until the work area is in compliance.
- 10.13.9 Remove all the barriers once the removal and clean up is complete.

10.14 DISPOSAL

- 10.14.1 Remove sealed and labelled asbestos waste and dispose of in an authorized disposal area in accordance with regulatory agencies having jurisdiction. Provide a Dangerous Goods Manifest to accompany the transfer of waste from work site to disposal area.
- 10.14.2 Ensure the container is accompanied to the dump by a signed waste manifest form. Ensure compliance of manifest system requirements for disposal of hazardous waste. **DO NOT DRY SWEEP SUSPECT DUST OR DEBRIS.** All suspect ACMs must be completely saturated prior to clean up. All asbestos waste will be sealed in plastic bags and identified as being asbestos waste. These plastic bags must be stored out of view to the public and in an area not frequented by personnel.
- 10.14.3 Ensure dump operator is fully aware of hazardous material being disposed of. The person(s) responsible shall then contact a qualified company to remove the asbestos waste.
- 10.14.4 Before disposing any asbestos waste, consult your supervisor.

REFERENCES

10.15 APPLICABLE REFERENCE DOCUMENTS

- 10.15.1 The current issue of each document shall govern. Where conflict among requirements or with these specifications exists, the more stringent requirements shall apply.
- 10.15.2 Regulations: Comply with applicable Federal, Provincial, municipal, and local regulations.
 - a) Occupational Health & Safety (OH&S) Regulations, WCB.
 - b) Waste Management Act Regulations, Waste Management Branch, British Columbia Ministry of the Environment.
- 10.15.3 Codes and Standards:
 - a) ASTM-American Society for Testing and Materials

- b) CGSB-Canadian General Standards Board CGSB 1-GP-205M
Standard for: Sealer for Application to Asbestos-Fibre
Releasing Materials.
- c) CSA-Canadian Standards Association.
 - 1. CSA Standard S269.2-M1980
 - 2. CSA standard Z94.4-M1982
- d) ULC-Underwriters Laboratories, Canada.
- e) WCB-Safe Work Practices for Handling Asbestos, 2002 Edition.

APPENDIX C
ASBESTOS EXPOSURE CONTROL PLAN
INSPECTION CHECKLIST

**ASBESTOS EXPOSURE CONTROL PLAN
INSPECTION CHECKLIST**

BUILDING: _____

ADDRESS: _____

DATE: _____ **INSPECTED BY:** _____

LAST INSPECTION PERFORMED: _____

AREA:	_____
CONDITION:	_____
CHANGE IN	CONDITION SINCE PREVIOUS INSPECTION: _____
COMMENTS:	_____

AREA:	_____
CONDITION:	_____
CHANGE IN	CONDITION SINCE PREVIOUS INSPECTION: _____
COMMENTS:	_____

**APPENDIX D
ASBESTOS CONTAINING ROOM
ENTRY FORM**

**APPENDIX E
CONTRACTOR LOG SHEET**

CONTRACTOR LOG SHEET

COMPANY NAME	NUMBER OF WORKERS ON SITE	START DATE	END DATE	AREA WORKED IN	NATURE OF WORK

**APPENDIX F
CONTRACTOR AWARENESS FORM**

ATTENTION: ALL CONTRACTORS

RE: PRESENCE OF ASBESTOS

For your safety and protection, you are hereby advised of the presence of asbestos-containing materials at this location, and you are required to take all appropriate precautionary measures.

Asbestos containing materials are the following:

Asbestos Materials	Location
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

By signing this form, you are establishing that all your employees, as well as the employees of your sub-contractors, having cause to enter the site, have had instruction on the hazards of asbestos exposure, on respirator use, on dress, all other aspects of work procedures, and protective measures.

(Location Representative) Signed By:

(Contractor) Received By:

(Contractor) Company:

Date:

**APPENDIX G
RESPIRATOR FIT - TEST FORM**



RESPIRATOR FIT - TEST FORM - Examination

JOB SITE: _____

PERSON TESTED: _____ DATE: _____

COMPANY NAME: _____

RESPIRATOR TYPE AND NUMBER: _____

EXAMINER'S NAME: _____

DOES THE USER WEAR:

EYEGASSES	Y / N	DENTURES	Y / N
CONTACT LENSES	Y / N	FACIAL HAIR	Y / N

IF YES TO ANY OF THE ABOVE, DISCLOSE WITH EXAMINER.

COMMENTS: _____

VISUAL INSPECTION OF RESPIRATOR: GOOD _____ POOR _____

IF POOR, DISCUSS WITH EXAMINER.

COMMENTS: _____

RESPIRATOR DONNING & SMOKE TEST PROCEDURES:

1. ENSURE THE WORKER IS CLEAN SHAVEN & HAS BEEN INSTRUCTED IN SAFE USE OF RESPIRATOR.
2. INSPECT RESPIRATOR AND WORKING COMPONENTS.
3. DON RESPIRATOR & ADJUST STRAPS TO FIT RESPIRATOR COMFORTABLY TO FACE
4. VISUAL CHECK TO VERIFY AIR TIGHT SEAL AROUND FACE PIECE.
5. CONDUCT POSITIVE AND NEGATIVE PRESSURE FIELD CHECKS.
6. CONDUCT IRRITANT SMOKE TEST WHILE WEARER CARRIES OUT EXERCISES INCLUDING NORMAL BREATHING, DEEP BREATHING, TURNING HEAD FROM SIDE TO SIDE, NODDING HEAD UP AND DOWN AND TALKING. (NOTE: DO THIS PROCEDURE TWICE, FIRST TIME WITH LITTLE SMOKE, REPEAT WITH HEAVIER CONCENTRATION TO ENSURE PROPER SEAL)

PRIOR TO ENTERING WORK AREA, ENSURE NEGATIVE PRESSURE CHECK IS COMPLETED LAST AND RESPIRATOR TO FACE SEAL IS OBTAINED.

HAS A SATISFACTORY FACIAL SEAL BEEN OBTAINED: _____

TEST NOTES: _____

SIGNATURE OF EXAMINER: _____

EMPLOYEE ACKNOWLEDGEMENT:

I, THE UNDERSIGNED, HAVE BEEN FIT TESTED AND COUNSELLED IN THE USE, LIMITATIONS AND MAINTENANCE OF THE ABOVE NOTED RESPIRATOR.

EMPLOYEE'S NAME _____

DATE _____