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## **PART 1 – GENERAL**

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### **1.1 REGULATORY REQUIREMENTS**

.1 An investigation into the presence of designated substances at the Building in Ottawa, Ontario, was performed in order to meet the requirements of the Canada Labour Code under Part II, section 124 which stipulates that every employer shall ensure that the health and safety at work of every person employed by the employer is protected and those employees are made aware of every “known or foreseeable health or safety hazard” in the work environment. Also, it was performed to meet the requirements of Section 30 of the *Ontario Occupational Health and Safety Act, Revised Statutes of Ontario, 1990, Chapter 0.1*. By having a Designated Substances Report (DSR) conducted, the Departmental Representative will be able to inform his or her employees, contractors, and tenants of any designated substances that may be present and possibly disturbed throughout the duration of the project. The informed Departmental Representative will then be able to impose appropriate health and safety precautions for all applicable personnel as required. The *Guide to Green Government* sets out the policy requirements for the federal government to meet or exceed federal environmental statutes and regulations, and the emulation of best practices from the public and private sector. Within the *Guide to Green Government*, pollution prevention efforts are required in federal projects. Pollution prevention is defined as the use of processes, practices, materials, products or energy that avoid or minimize the creation of pollutants and waste, and reduce overall risk to human health and environment. These policies must be adhered to throughout the duration of the Turbine Replacement Project at the Building.

.2 The designated substances identified in the *Occupational Health and Safety Act* and its corresponding regulations are:

- .1 **Acrylonitrile:** “Designated Substance – Acrylonitrile” *O.Reg 835* (as amended by *O.Reg 490/09*)
- .2 **Arsenic:** “Designated Substance – Arsenic” *O.Reg 836* (as amended by *O.Reg 490/09*)
- .3 **Asbestos**
  - .1 “The Regulation Respecting Asbestos” *O.Reg 837* (as amended by *O.Reg 490/09*)
  - .2 “General – Waste Management” *O.Reg 347* (as amended by *O.Reg 337/09*)
  - .3 “Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations” *O.Reg 278/05* (as amended by *O.Reg 493/09*)

- .4 *PWGSC Departmental Policy DP 057 – “Asbestos Management”*
- .4 **Benzene:** “Designated Substance – Benzene” *O.Reg 839 (as amended by O.Reg 490/09)*
- .5 **Coke Oven Emissions:** “Designated Substance – Coke Oven Emissions” *O.Reg 840 (as amended by O.Reg 490/09)*
- .6 **Ethylene Oxide:** “Designated Substance – Ethylene Oxide” *O.Reg 841 (as amended by O.Reg 490/09)*
- .7 **Isocyanates:** “Designated Substance – Isocyanates” *O.Reg 842 (as amended by O.Reg 490/09)*
- .8 **Lead:**
  - .1 “Designated Substance – Lead” *O.Reg 843 (as amended by O.Reg 490/09)*
  - .2 “General – Waste Management” *O.Reg 347 (as amended by O.Reg 337/09)*
  - .3 Hazardous Products Act’s *Regulations Amending the Surface Coating Materials Regulations*  
SOR/2010-224
- .9 **Mercury:**
  - .1 “Designated Substance – Mercury” *O.Reg 844 (as amended by O.Reg 490/09)*
  - .2 “General – Waste Management” *O.Reg 347 (as amended by O.Reg 337/09)*
- .10 **Silica:** “Designated Substance – Silica” *O.Reg 845 (as amended by O.Reg 490/09)*
- .11 **Vinyl Chloride:** “Designated Substance – Vinyl Chloride” *O.Reg 846 (as amended by O.Reg 490/09)*
- .3 All contractors requesting tenders from subcontractors shall furnish this report to subcontractors. **This report must be read in its entirety including all text and tables (if applicable).**

1.2 VALIDITY DATE

- .1 El Houcine Faouzi, Environmental Analyst of the Environmental Services Directorate of the Real Property Branch, PWGSC, conducted the on-site survey for this report on 2012/08/07.

- .2 The work area is located at the Building, Ottawa, Ontario. The scope of the work proposed consists of painting walls and floors, replacing insulation on exhaust stack and painting existing turbine engines.
- .1 The scope of work for this report involved a visual inspection of building materials and contents for the presence of suspected designated substances in the project area.
- .2 From the visual inspection suspect materials were sampled and analyzed, where appropriate, for the above substances. On the basis of this inspection, a total of six (6) bulk samples of suspected asbestos-containing materials (ACMs) were collected. ACM samples were collected in order to satisfy the requirements of *O. Reg. 278/05*, as amended.
- The samples were submitted for analysis to the Maxxam Analytics International Corporation Laboratory (an accredited CAEAL lab) located at 32 Colonnade Road, Unit#100 Nepean, Ontario, K2E 7J6.
- The asbestos samples were analyzed using Polarized Light Microscopy (PLM). This analytical method complies with the United States Environmental Protection Agency (U.S. EPA) Method 600/R-93/116.
- .3 The visual inspection and sampling was limited to readily accessible areas. Destructive testing was not included in the investigation, but is recommended prior to any major demolition. Due to the nature of building construction, some inherent limitations exist as to the possible thoroughness of the designated substance survey. The survey did not include the demolition of floors, floor finishes, plaster ceilings or walls or other areas to examine concealed conditions. No confined space was accessed for the purpose of this report.
- .4 It is possible that the designated substances aforementioned are present in non-accessible areas and concealed spaces (i.e., wall and ceiling cavities), or confined spaces. No other areas outside the defined work boundaries have been assessed.
- .5 Prior to beginning work, it must be confirmed with the Departmental Representative that no additional designated substances have been brought to the project area.
- .6 In addition, the survey refers to PCBs and halocarbons; however, it does not refer to

other substances that may be present in the day-to-day usage for specialized equipment or areas in buildings (i.e. lead shields, fume hoods, etc.).

- .7 There is a possibility that materials which could not be reasonably identified within the scope of this assessment or which were not apparent during previous site visits may exist. Should any designated substance be encountered in the course of demolition, work must be stopped, preventative measures taken, and the Departmental Representative must be notified immediately. **Do not proceed until written instructions have been received.**

## **PART 2 - DESIGNATED SUBSTANCES**

### **2.1 SURVEY RESULTS**

.1 **ACRYLONITRILE:** Not Identified

.2 **ARSENIC:** Not Identified

.3 **ASBESTOS: Identified**

Asbestos is a naturally occurring material. In general, it has historically been intentionally added to many building materials in the construction industry to increase thermal or chemical resistance properties. More common uses are thermal insulation for pipes and boilers, structural steelwork fireproofing, floor tiles and in-wall and ceiling plasters. There are two classes of asbestos-containing materials: friable and non-friable. Friable asbestos-containing materials are loose in composition or can be easily crumbled using hand pressure. Non-friable asbestos-containing materials are more durable and are held together by a binder such as cement, vinyl or asphalt.

Representative samples, collected on 2011/08/07 from materials located within the project area have been analyzed for asbestos. The results from the sampling indicate that there is friable chrysotile asbestos present in gasket samples collected from the exhaust discharge (AS-2A\*). The results from the sampling also indicated that no asbestos was detected in the white insulation collected from the exhaust discharge (AS-2A\*, AS-2B\*, AS-2C\*). The results are shown in Table 1 below.

**Table 1: Asbestos Sample Results**

Sample ID	Material	Location	Asbestos Type	Asbestos content (%)
AS-1A*	Insulation	On exhaust discharge, Generator Room	n/a	n/d
AS-1B*	Insulation	On exhaust discharge, Generator Room	n/a	n/d
AS-1C*	Insulation	On exhaust discharge, Generator Room	n/a	n/d
<b>AS-2A*</b>	<b>Gasket</b>	<b>On exhaust discharge, Generator Room</b>	<b>Chrysotile</b>	<b>65%-70%</b>
AS-2B*	Gasket	On exhaust discharge, Generator Room	Not analyzed, stop on positive option as per O.Reg 278/05	
AS-2C*	Gasket	On exhaust discharge, Generator Room		

n/d = none detected, n/a = not applicable

**\*Please note: Original sample names have been altered for the purposes of this report, however all other information regarding sample material, location and their individual results is accurate.**

.4 **BENZENE:** Not Identified

.5 **COKE OVEN EMISSIONS:** Not Identified

.6 **ETHYLENE OXIDE:** Not Identified

.7 **ISOCYANATES:** Not Identified

.8 **LEAD: Suspected**

Lead is a naturally occurring metal. It was used primarily in paint prior to the 1980's to increase the drying process. Lead in paint becomes a danger when it is old or damaged, as it creates lead dust and chips. Lead can also be found in soldered joints installed on piping up to the mid 1990s and in older cast iron bell and spigot joints.

- .1 According to the Hazard Products Act's *Regulations Amending the Surface Coating Materials Regulations* SOR/2010-224 allowable concentration of lead in surface coatings is 0.009 percent by weight (weight of lead to weight of paint), which is equivalent to 90 parts per million (ppm).
- .2 Even at very low concentrations, there may be potential for exposure to very high levels of lead depending on the activities performed that disturb the lead-containing materials. At low lead concentrations, conducting a risk assessment to assess the potential for exposure is required to determine the need to follow precautionary measures.

- .3 Lead is suspected to be present in the silver and grey paints observed on the equipment to be replaced and the beige paint on walls of the generator room. Sampling of these paints was not possible without matrix interference.
  
- .9 **MERCURY:** Not Identified
  
- .10 **SILICA: Identified**  
Free crystalline silica is present in concrete within the project area.
  
- .11 **VINYL CHLORIDE MONOMER:** Not Identified
  
- .12 **POLYCHLORINATED BIPHENYLS (PCBs):** Not Identified
  
- .13 **HALOCARBONS:** Not Identified

## 2.2 RECOMMENDATIONS

### 1. ASBESTOS

PWGSC's *DP 057, Asbestos Management*, sets policy, establishes roles and responsibilities and provides a code of practice for the management of and working with asbestos-containing materials. All work must be done in accordance with this directive, as well as all other applicable legislation. Disturbance of all asbestos (whether friable or non-friable) is regulated in Ontario by "Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations" *O.Reg 278/05* (as amended by *O.Reg 493/09*), which outlines the precautions required when performing work involving asbestos-containing materials. The regulation stipulates appropriate respiratory protection, work procedures and ventilation requirements that must be utilized during the disturbance of any asbestos-containing materials, or materials suspected to contain asbestos.

.1 The following criteria shall be utilized in determining the classification of asbestos work as indicated in *PWGSC DP 057, Annex C, Appendix 5* and "Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations" *O.Reg 278/05* (as amended by *O.Reg 493/09*). These criteria are not exhaustive. When classification of the work is uncertain, refer to the Ontario Regulation:

**Type 1** work generally includes installation or removal of a wetted non-friable ACM with a hand tool; disturbance of wetted non-friable ACM with a powered tool equipped with a High Efficiency Particulate Aerosol (HEPA) dust collection device; removal of less than one square metre of wetted drywall materials where joint filling materials contain asbestos; removal or replacement of less than 7.5 square metres asbestos-containing compressed mineral fibre-type ceiling tiles; collecting wetted samples of suspected friable asbestos material, and working close to friable sprayed asbestos, where the material may be affected by the work activities.

**Type 2** work generally includes the removal or replacement of more than 7.5 square metres asbestos-containing compressed mineral fibre-type ceiling tiles; entry into ceiling space, crawl spaces, pipe tunnels etc., where friable asbestos debris is present; minor removal of friable ACM; Type 2 removal is limited to a maximum per work period of one square metre of surface area; the repair of asbestos mechanical insulation (no limit is imposed as to the amount of repair permitted under Type 2 conditions); and any disturbance not classified as either Type 1 or 3.

**Type 3** work generally includes more than minor removal or disturbance of friable ACM; the use of a power tool on non-friable ACM without a HEPA exhausted dust collection; the spray application of an encapsulate or sealer to friable asbestos surfacing materials; the disturbance of the ductwork and air handling equipment serving or passing through areas of buildings with sprayed asbestos fireproofing or insulation, and the repair, alteration or demolition of a boiler, furnace, kiln or similar equipment with asbestos-containing refractory.

In the event of conflict between DP-057 and "Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations" *O.Reg 278/05* (as amended by *O.Reg 493/09*), the more stringent shall apply.

## 2. LEAD

If lead-containing materials are disturbed (i.e. during dry sanding, grinding, polishing and sawing operations), then proper precautions, as outlined under "Designated Substances" *O.Reg 490/09*, as amended, of the Occupational Health and Safety Act, must be followed.

Under Ontario Regulation 490/09, as amended of the Occupational Health and Safety Act, regulatory limits have been established for occupational exposure limits to airborne lead that may be present in a workplace. The Time Weighted Average Exposure Values to airborne lead dust or fumes should not exceed the Ministry of Labour's 0.05 milligram per cubic metre (mg/m<sup>3</sup>) limit during the removal of paints and products containing any concentration of lead. The TWAEV represents the time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse health effects.

Contractors performing work that requires disturbance of lead-containing materials are responsible to ensure that the workers are not exposed to airborne lead dust levels in excess of the time-weighted average and Maximum Exposure Concentration for lead-containing paints. It should be noted that the use of mechanically-powered tools or torches on lead-containing materials increases the concentration of airborne lead dust or fumes and thereby requiring more stringent respiratory protection and controlled work procedures.

.1 Ontario Ministry of Labour (MoL) has published the document entitled "*Guideline: Lead on Construction Projects*". This document classifies all disturbances of lead-containing materials as Type 1, Type 2a, Type 2b, Type 3a or Type 3b work, based on presumed airborne concentrations of lead generated during the work each of which will have defined work practices. Although this document is not a regulation, Ministry of Labour Inspectors use it as guidance during site inspections.

.2 The work procedure outlined below can be used as a guide but where there is conflict with the exposure limits and respiratory protection required by "Designated Substances" Regulation *O.Reg 490/09*, the most stringent requirements of Regulation *490/09* must apply.

**Type 1 Operations**, as defined in the MoL guideline, applies to work that includes applying coatings containing lead by means of brush or roller; removal of lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap; removal of lead-containing coatings or materials using a power tool that has an effective dust collection system equipped with a HEPA filter; installing or removing lead or lead-alloy sheet materials; installing or removing lead packing, Babbitt metal or similar material; removing coating or materials containing lead

using non-powered hand tools other than manual scraping or sanding and soldering materials containing lead. Type 1 work practices outline that where workers request a respirator, the employer must provide at minimum a half-face piece air purifying respirator with N-, R-, or P- series particulate filters and 95, 99 or 100% efficiency. Dust and waste must be cleaned up at least daily, and removed at completion of the operation.

**Type 2 Operations**, as defined in the MoL Guideline, applies to work that includes applying coating containing lead by means of spraying; removing coating or materials containing lead by scraping or sanding using non-powered tools; manual demolition of lead-painted plaster walls or building components by striking a wall with a sledge hammer or similar tool and outdoor welding or high temperature cutting of lead-containing coating, other than during dismantling or demolishing. Type 2 work practices requiring a National Institute of Occupational safety and Health (NIOSH) Assigned Protection Factor (APF) of 10 outline that employers must provide workers at minimum a half-face piece respirator with N-, R-, or P- series particulate filters (dust, fume and mist ) and 95, 99 or 100% efficiency (plus solvent protection during spray-coating applications). Type 2 work practices requiring a NIOSH APF of 25 outline that powered air purifying respirators with a hood or helmet, and any type of high efficiency filter shall be used at minimum. Supplied air respirators equipped with a hood or helmet and operated in a continuous flow mode are also acceptable.

**Type 3 Operations**, as defined in the MoL Guideline, applies to work that includes abrasive blasting of lead-containing coating; indoor or in confined space welding or high-temperature cutting of lead-containing coatings or materials; dry removal of lead-containing mortar using a drill or pneumatic device; removal of lead-containing coatings or materials using power tools without an effective dust collection system equipped with a HEPA filter; removing or repairing a ventilation system where dust containing lead is present within the system; demolition or clean-up of a facility where lead-containing products were manufactured, removal of lead-containing dust using an air-mist extraction system; outdoor high-temperature cutting of material with lead-containing coating done in the course of dismantling or demolishing a machine, building, structure, or plant and burning of a surface with lead-containing

coating; and any operation that may expose a worker to lead dust, fume or mist that is not a Type 1 or Type 2 operation. Type 3 work practices outline that warning signs, in sufficient numbers, must be posted to warn the public of the hazards. Before any indoor sandblasting operation is conducted, signs shall be posted at least at each entrance to the work area. For indoor or confined space burning, cutting or welding, local exhaust ventilation must be provided with sufficient velocity to capture fumes. Where local exhaust does not have HEPA filter, air must be discharged to the exterior. If local exhaust ventilation is not available, workers and all persons entering the work shall wear a positive pressure supplied air respirator. Type 3a work practices require a NIOSH APF of 50 while Type 3b operations require a NIOSH APF of greater than or equal to 1,000. There are several respirator types assigned these APFs. Refer to MoL guideline for information on required respirator type.

.3 The disposal of construction waste containing lead is controlled by "General – Waste Management" *O.Reg 347/09, as amended*, under the *Ontario Environmental Protection Act*. The classification of the waste is dependent upon the result(s) of leachate test(s). The waste can be classified as "hazardous", "non-hazardous" or "registerable solid waste", depending on the results of the leachate test.

Prior to disposal, the concentration of leachable lead must be determined for waste materials with elevated lead contents following the Toxicity Characteristic Leaching Procedure (TCLP).

### 3. SILICA

.1 Silica occurs as crystalline material in cement. Crystalline silica is regulated under "Designated Substance – Silica" *O.Reg 845 (as amended by O.Reg 490/09)* of the *Occupational Health and Safety Act* as a Designated Substance.

.2 Silica dust can be generated through such processes as blasting, grinding, crushing, and sandblasting silica-containing material. Since silica is present in concrete within the project area, appropriate respiratory protection and ventilation must be donned during the demolition and modifications of these structures.

.3 The Occupational Health and Safety Branch of the MoL has published the document entitled "*Guideline: Silica on Construction Projects*". This document classifies the disturbance of materials

containing silica as Type 1, Type 2 or Type 3 work, and assigns different levels of respiratory protection and work procedures for each classification. These work procedures should be followed when performing work involving the disturbance of silica-containing materials.

#### **4. CONTRACTORS DUTIES**

The contractor must review the designated substances report and take the necessary precautions to protect the health and safety of the workers and the environment. As per Section 30(4) of the *Ontario Occupational Health and Safety Act*, the party hiring the contractor (i.e. Departmental Representative) shall ensure that the contractor and subcontractor (if any) for the project has received a copy of the designated substance report prior to entering a binding contract for the supply of work on the project. As per Section 27(2) (a, b, and c) of the *Ontario Occupational Health and Safety Act*, while onsite, the contractor supervisor shall exercise every reasonable precaution for the protection of a worker. If you have any questions about the designated substance report, please contact the Departmental Representative.

**END OF SECTION**