

PART 1 – GENERAL

1.1 REGULATORY REQUIREMENTS

.1 An investigation into the presence of designated substances for the O-276 Chiller Replacement Project located at 20 Airbus Private, Ottawa, Ontario was performed in order to meet the requirements of the Canada Labour Code under Part II, Section 124 that states that every employer shall ensure that the health and safety at work of every person employed by the employer is protected. 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 O.1. Furthermore, Section 125(1)(z.14) of the *Canada Labour Code* stipulates that the employer, to the extent that he controls the activity, will take all reasonable care to ensure that all persons granted access to the work place, other than the employer's employees, are informed of every known or foreseeable health and safety hazard to which they are likely to be exposed in the work place. By having a Designated Substances Report (DSR) conducted, the PWGSC 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.

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

- .1 **Acrylonitrile:** "Designated Substances"
O. Reg 490/09, as amended.
- .2 **Arsenic:** "Designated Substances"
O. Reg 490/09, as amended.
- .3 **Asbestos:**
 - .1 "Designated Substances"
O. Reg 490/09, as amended.
 - .2 "*General – Waste Management*"
O. Reg 347/90, as amended
 - .3 "Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations" *O.Reg 278/05 (as amended)*
 - .4 *PWGSC Departmental Policy DP 057 – "Asbestos Management"*
- .4 **Benzene:** "Designated Substances"
O. Reg 490/09, as amended.
- .5 **Coke Oven Emissions:** "Designated Substances" *O. Reg 490/09, as amended.*
- .6 **Ethylene Oxide:** "Designated Substances"
O. Reg 490/09, as amended.

- .7 **Isocyanates:** "Designated Substances"
O. Reg 490/09, as amended.
- .8 **Lead:**
 - .1 "Designated Substances"
O. Reg 490/09, as amended.
 - .2 "*General – Waste Management*"
O. Reg 347/90, as amended
 - .3 *Canada Consumer Product Safety Act's Surface Coating Materials Regulations SOR/2005-109 (as amended)*
- .9 **Mercury:**
 - .1 "Designated Substances"
O. Reg 490/09, as amended.
 - .2 "*General – Waste Management*"
O. Reg 347/90, as amended
- .10 **Silica:** "Designated Substances"
O. Reg 490/09, as amended.
- .11 **Vinyl Chloride:** "Designated Substances"
O. Reg 490/09, as amended.
- .3 All contractors requesting tenders from subcontractors shall furnish this report to subcontractors.

1.2 VALIDITY DATE

- .1 El Houcine Faouzi from Environmental Services Directorate of the Real Property Branch, PWGSC, conducted the on-site survey for this report on August 7, 2014.
- .2 The work area is located at the O-276 Building, 20 Airbus Private, Ottawa, Ontario. The scope of the work proposed consists of removing and replacing one (1) 40 ton chiller located in the Hydraulic Pump House in the back courtyard of the O-276 building and two (2) Air Handling Units (AHUs) located on the roof of the O-276 building.
 - .1 The scope of work for this report involved a visual inspection and sampling 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 the visual inspection, a total of three (3) bulk samples of suspected asbestos-containing materials (ACMs), and three (3) bulk samples of suspected lead-containing paints and mortar were collected. Bulk ACM samples were collected in order to satisfy the requirements of *O. Reg. 278/05, as amended.*

The samples were then submitted for analysis to the EXOVA Laboratory (accredited by the Canadian Association for Laboratory Accreditation (CALA) and National Voluntary Laboratory Accreditation Program (NVLAP)) located at 146 Colonnade Road, Unit 8, Ottawa, Ontario.

The bulk 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.

The lead analysis of the paint and mortar samples was completed using Inductively Coupled Plasma – Mass Spectrometry (ICP-MS) in accordance with U.S. EPA Method 6010-C.

- .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. 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 polychlorinated biphenyls (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.
- .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, precautionary 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:** Not 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.

Analytical results show that the bulk samples of the brown caulking collected from the AHU exhausts on the roof of O-276 building do not contain asbestos. The results are shown in Table 1 below.

Table 1: Asbestos Sample Results by Polarized Light Microscopy (PLM)

Sample ID	Material	Location	Asbestos Type	Asbestos content (%)
O276-AS-1A	Brown caulking	AHU exhaust, roof of O-276 building	n/a	n/d
O276-AS-1B			n/a	n/d
O276-AS-1C			n/a	n/d

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

.4 **BENZENE:** Not Identified

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

.6 **ETHYLENE OXIDE:** Not Identified

.7 **ISOCYANATES:** Not Identified

.8 **LEAD: Identified**

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 *Canada Consumer Product Safety Act's Surface Coating Materials Regulations SOR/2005-109* (as amended), 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 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.
- .3 Analytical results indicate that the lead content in the white paint on the enclosure beams (O276-Pb-3) located on the roof of the O-276 building is 90 ppm, and as such is considered to be 'lead-based', as per the *Canada Consumer Product Safety Act's Surface Coating Materials Regulations SOR/2005-109*. The results are shown in Table 2 below.

Table 2: Lead Sample Results analyzed by ICP-MS

Sample ID	Description	Location	Lead Content (ppm)
O276-Pb-1	Floor grey paint	Hydraulic Pump House beside the chiller that will be replaced	70
O276-Pb-2	White paint	Enclosure structure on the roof of the O-276 building	60
O276-Pb-3	White paint	Beams of the enclosure structure on the roof of the O-276 building	90

Bold items exceed the 90 ppm limit for lead, as per *Canada Consumer Product Safety Act's Surface Coating Materials Regulations SOR/2005-109* (as amended)

.9 MERCURY: Not identified

Within the project area, only one (1) thermometer suspected to contain liquid mercury was observed. It was located on the chiller that will be replaced in the Hydraulic Pump House.

.10 SILICA: Identified

Free crystalline silica is present in concrete in the project areas.

.11 VINYL CHLORIDE MONOMER: Not Identified

.12 POLYCHLORINATED BIPHENYLS (PCBs): Not Identified

.13 HALOCARBONS: Identified

Although not a designated substance, halocarbons are commonly used in refrigeration and air-conditioning equipment, fire suppression equipment and solvents. The most common are chlorofluorocarbons (CFCs and its derivatives) which when released into the air, rise to the upper atmosphere and destroy the ozone layer.

Halocarbon-containing equipments found in the project area are listed in Table 3 below.

Table 3: Halocarbon Containing Equipment

Location	Type of equipment	Halocarbon Type	Halocarbon content (lbs)
Hydraulic Pump House	McQuay chiller	R-22	80 lbs
Roof of O-276 Building	ENG-Air AHU	R-22	30 lbs
Roof of O-276 Building	ENG-Air AHU	R-22	30 lbs

2.2 RECOMMENDATIONS

1. LEAD

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

.2 Under *Regulation 490/09* (as amended), 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/m³) 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.

.3 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 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.

.4 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.

.5 The disposal of construction waste containing lead is controlled by "*General – Waste Management*" O.Reg 347/90 (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.

2. MERCURY

.1 Mercury is governed by the *Regulation 490/09* (as amended) under the *Ontario Occupational Health and Safety Act*. The regulation provides requirements for allowable exposure levels.

.2 Should the disturbance or removal of equipment containing mercury be required, the Ontario Ministry of Labour (MoL) publication '*The Safe Handling of Mercury: A Guide for the Construction Industry*', should be followed.

.3 Mercury waste is considered a hazardous waste under "*General – Waste Management*" O.Reg 347/90 (as amended) of the *Ontario Environmental Protection Act*. Mercury thermometers should be recycled if removed from service.

3. SILICA

.1 Silica is governed by the *Regulation 490/09* (as amended) under the *Ontario Occupational Health and Safety Act*. The regulation provides requirements for allowable exposure levels.

.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 areas, 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 Ontario Ministry of Labour (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. HALOCARBONS (NOT RECOGNIZED AS A DESIGNATED SUBSTANCE)

.1 When halocarbon-containing equipment requires dismantling or disposal, this equipment must be tagged by a certified technician before it can be dismantled or disposed, as per the requirements of the *Federal Halocarbon Regulations* (2003) and "*Refrigerants*" O.Reg 189/94, as amended or "*Ozone Depleting Substances and Other Halocarbons*", O.Reg. 463/10. If the units are to be removed, no release of the refrigerant shall occur in accordance with the Canadian Environmental Protection Act. If the units are being disposed, a qualified Ozone-Depleting Substances (ODS) technician with environmental awareness training must drain and remove the ODSs. ODS recycling and recovery initiatives must be undertaken for any ODS-containing units being displaced by proposed work.

.2 The *Ozone-Depleting Substances Regulations* made under the *Canadian Environmental Protection Act* control the reclamation, recovery and recycling of ODSs. Environment Canada has prepared a Code of Practice for the Reduction of Chlorofluorocarbon Emissions from Refrigeration and Air Conditioning Systems (1991) which outlines practices to be followed when conducting maintenance on these refrigerant-containing units. The *Federal Halocarbon Regulation* regulates releases, recovery and recycling of ODS and their halocarbon alternatives in the federal domain to ensure that these releases are minimized. Even though halocarbon alternatives to ODSs may have no impact on the ozone layer, they are greenhouse gases and thus contribute to climate change. The Regulations ensure that actions are taken to prevent releases of ODS and their halocarbon alternatives; to report these releases; that adequate training is provided to personnel; that operational and emergency procedures and strategic plans are developed for the use, control and phase-out of these substances. During this project, these regulations must be followed when dealing with ODSs.

5. CONTRACTORS DUTIES

The contractor must review the designated substance 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