Ontario Power Generation

Standard

TITLE
MANAGEMENT OF WASTE AND OTHER ENVIRONMENTALLY REGULATED MATERIALS

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DOCUMENT RELATIONSHIP	
Applicability:	OPG Wide
Receives Authority from:	OPG-PROG-0005, ENVIRONMENT HEALTH AND SAFETY MANAGED SYSTEMS

Document is Related to Pressure Boundary ☐	Document Requires CNSC Notification ☑

PURPOSE AND SCOPE

The purpose of this standard is to define Ontario Power Generation's operating criteria and expected behaviours to manage wastes and other environmentally regulated materials as defined in applicable legislation, including;

Ontario Regulation 347 under the Environmental Protection Act, General Waste Management

Ontario Regulation 362 under the Environmental Protection Act, Waste Management – PCBs

PCB regulations – (CEPA) SOR/2008-273

Provisional Certificate of Approval for Waste Management System, No. A 841692

Transportation of Dangerous Goods Regulations

Federal Halocarbon Regulations SOR/2022-110

Ontario Regulation 463/10 Ozone Depleting Substances and Other Halocarbons
N292.03-14 Management of Low and Intermediate Level Radioactive Waste

DATES (YYYY-MM-DD)	
PDF Creation Date:	2023-07-20
Compliance Date:	Immediate

EXCEPTIONS

High level radioactive waste.
This procedure does not provide direction for fire extinguishing systems, solvent systems, foam systems or Ozone Depleting Substances-containing equipment on motor vehicles.

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1.0 DIRECTION

Waste and other environmentally regulated materials shall be handled, processed, shipped and stored in accordance with the applicable federal, provincial and municipal regulations.

Waste generators shall ensure a method is in place to dispose of waste that will be generated by their activities and work programs.

Waste generators shall follow the concept of “Reduce, Reuse, Recycle” as follows:

- Reduce – Minimize waste generation; always the best option whenever possible. This is frequently achievable through good work planning,
- Reuse – Identify reuse options either within work groups on-site, or with the assistance of Investment Recovery (refer to OPG-PROC-0081 Investment Recovery: Disposal of Surplus Assets and/or N-PROC-MM-0036, Identification and Disposition of Surplus Inventory,
- Recycle – Segregate recyclable materials from other wastes in accordance with local procedures.

1.1 Purpose

This standard outlines the requirements for management of waste and other environmentally regulated materials at Ontario Power Generation (OPG). OPG falls subject to waste management as regulated by Ontario Regulation 347 General Waste Management, Ontario Regulation 362 Waste Management – Polychlorinated Biphenyls (PCB), and the Provisional Certificate of Approval for a Waste Management System, No. A841692.

In addition, Nuclear operations fall subject to radioactive waste management as per the Canadian Nuclear Safety Commission (CNSC) Nuclear Safety and Control Act. The scope of this standard is limited to low and intermediate level radioactive waste only. The regulatory requirements are authorized by the Nuclear Safety and Control Act through the relevant sections of Canadian Standards Association (CSA) N292.3-14 and the relevant sections of the Transportation of Dangerous Goods Regulations (TDGR) pertaining to nuclear materials.

This standard also addresses the in-service requirements of:

- PCB management at OPG in accordance with Federal Regulation SOR/2008-273,
- Ozone Depleting Substance (ODS) management in accordance with Ontario Regulation 463/10 Ozone Depleting Substances and other Halocarbons, and federal undertakings in accordance with SOR/2022-110 Federal Halocarbon Regulations,
- Transportation of Dangerous Goods (TDG) management in accordance with Federal Consolidated Transportation of Dangerous Goods Regulations including Amendment SOR/2016-95.

1.2 Summary of Regulatory Requirements for Waste Management

Ontario’s regulatory framework for environmental management of hazardous waste and liquid industrial waste is set out in Ontario Regulation 347 General Waste Management. Generators

of subject waste are required to register their waste generation facility by completing a Generator Registration Report (GRR) electronically through the Hazardous Waste Program (HWP) Registry which is operated and maintained by the Registrar of the Resource Productivity and Recovery Authority (RPRA).

Generators of subject waste are required to pay any applicable fees through RPRA's digital HWP Registry or HazTrack mobile app. The generator registration process provides the Ministry of the Environment, Conservation and Parks (MECP) with the necessary information to develop waste profiles that promote effective waste monitoring and control.

Ontario Regulation 347 also regulates Ontario's Land Disposal Restrictions (LDR) for hazardous wastes. The LDR program affects both hazardous waste generators and the waste management industry which treats and processes hazardous wastes to undergo land disposal.

Additional requirements are set out in federal legislation for PCBs and the TDGs.

The Provisional Certificate of Approval/Environmental Compliance Approval (ECA) No. A841692 allows for the collection, handling and transportation of specific types and classes of wastes, including PCB wastes from field operations to local waste transfer facilities operated by OPG. This ECA is relied on extensively by Renewable Generation (RG) for operational control. Refer to the RG Waste Management Manual, available on the Environment intranet webpage, for additional guidance.

1.3 Overall Waste Management Process and Criteria

Materials purchased in support of OPG operations may contain chemicals which are known to be potentially hazardous to human health and/or the environment. Waste management processes ensure proper management of associated wastes such that adverse effects to human health and the environment are prevented and regulatory compliance is achieved.

Effectiveness of waste management processes is demonstrated by the ability to reliably achieve compliance criteria. Operational compliance criteria are often site-specific as indicated in Section 4.3.1 Performance References.

1.3.1 Waste Characterization and Registration

Subject waste is a term used to identify the types of wastes that must be registered with the MECP. It includes liquid industrial waste and hazardous waste, including hazardous wastes treated to remove characteristic hazards such as reactivity and ignitability.

All wastes must be characterized, and all subject wastes must be registered and reported to the MECP in the GRR through the Resource Productivity and Recovery Authority HWP Registry. Transport of subject waste can only occur for waste classes which are active under the HWP Registry.

As part of the registration process, a site profile is created which describes the site, company officials and subject wastes. If there is any change to the information in the GRR, a supplementary generator registration report must be completed and submitted through the Registry within 15 days of the change.

Generators are expected to maintain waste profiles reflective of wastes generated at the site.

1.3.2 Determining Land Disposal Restrictions

A subset of subject waste, known as listed or characteristic waste, requires treatment prior to being sent to a landfill. Land disposal treatment requirements are specified as either concentration-based numerical levels or specified methods of treatment.

All generators who produce a listed waste or characteristic waste that will be land disposed are required to fill in the LDR portion of the GRR. The Registry allows generators to complete the LDR notification form and attach it to the first manifest being sent to the receiver or to send it to the receiver ahead of the first shipment of the waste stream. This process ensures that wastes which have land disposal restrictions are dispositioned to receivers that are capable of treatment in accordance with the regulation prior to disposal in a landfill. Note that the Waste Generator number is required.

1.3.3 Waste Manifesting

Under Regulation 347, a manifest is a document used to track the movement of subject wastes as they move from a generator to an off-site receiving facility. Manifests are registered provincial documents and contain detailed information on the type of waste being shipped, overall volume/mass, the movements of the waste from generator to receiver and the treatment and storage requirements when they reach the receiver to ensure that these wastes are managed appropriately.

Waste manifests are prepared, signed, and submitted electronically via the Hazardous Waste Program Registry or the RPRA HazTrack mobile application. Manifests may be initiated by the generator or the carrier. The manifest is a three-part document, with each part completed by either the generator, carrier, or receiver. When all required information is provided and the waste is ready for shipment, the generator verifies that the generator and waste information on the manifest is correct then signs the manifest electronically (Part A). Part A is signed by the generator via competent individuals trained in Waste Management and depending upon the waste being shipped may also require Transportation of Dangerous Goods Regulation training. Part B is signed by the carrier and Part C by the receiver. **Waste generators are required to keep a record of completed waste manifests for a period of two years.**

Errors and/or incomplete information submitted on a waste manifest may occur. If an error is identified, parties must ensure corrections are made to the manifest. The process may not progress until all parties have acknowledged the change by signing online in the HWP Registry. All errors that are not corrected on signed Waste Manifests are violations of Regulation 347 and are reportable to the MECP.

For Nuclear, additional guidance on site specific processes for waste manifests is contained within D-INS-79000-10000, Completion of Waste Manifests at Darlington Nuclear and P-INS-79000-00010, Completion of Waste Manifests at Pickering Nuclear. For RG, additional guidance is contained within the Waste Management Manual, available on the Environment intranet webpage.

1.3.4 Storage of Subject Wastes

The operating criteria for storage of subject wastes are as follows:

a) Regulation 347 prohibits the storage of subject waste for a period exceeding 24 months at any waste generation facility;

Regulation 347 requires the waste generator to register inactive waste being stored for more than 90 days via submission of a one-time notice through the Registry. The notice must describe as accurately as possible, (i) the nature, amount and location of inactive subject waste being stored, or expected to be stored in the future, at the waste generation facility for more than 90 days, and (ii) how frequently inactive subject waste is expected to be stored in the future at the waste generation facility for more than 90 days. The notice must be submitted within five business days after the 90th day of storage. The notice is completed by logging on-site waste activities via the Registry. A separate registration must be completed for each waste to be stored on site for longer than 90 days.

b) Individual sites shall maintain a record of subject waste stored at a facility for greater than 90 days. The record shall be current (within 5 business days) and retained for 2 years after waste is removed.

To comply with the above operating criteria the waste generation facility shall have a process in place to monitor and record the accumulation of wastes put into storage.

Condition 10 of the OPG, Provisional Certificate of Approval/Environmental Compliance Approval (ECA) No. A841692 details requirements for the storage of subject wastes generated from field locations destined for a local waste transfer facility.

1.3.5 Additional Nuclear Requirements for Non-Rad Waste Management – *Nuclear Only*

a) Conventional Waste that originates from inside the Protected Area shall be determined to be free of radioactive contamination before leaving site as Inactive Waste as required by N-PROC-RA-0014 Radiological Zoning, Personnel/Material Monitoring.

b) Nuclear Waste Generators are directed to use the following documents to process Oil and Chemical Waste at Darlington and Pickering Nuclear Generating Stations:

- D-INS-79000-10001 Waste Disposal Guidelines for Oil and Chemical Wastes at Darlington
- P-INS-79000-00003, East Complex Chemical Waste Management
- P-INS-79000-00004, Management of Empty Chemical Waste Drums
- P-INS-79000-00006, Processing of Waste Oils – Operating Island
- P-INS-79000-00007, Management of Small Waste Chemicals and Drum/Tote Waste - Operating Island
- P-INS-79000-00008, Management of Waste Batteries
- P-INS-79000-00009, Managing Waste Bulk Liquid Shipments for Offsite Disposal
- NA44-OM-014-54600-04, Standby Generators – Standard Operating Conditions

- NK30-OP-09100-0003, Transferring Contaminated Water from Yard Containment Dikes
- P-INS-79000-00012, Liquid Waste Management Process Chart
- P-INS-79000-00014, Tracking Subject Waste Responsibilities
- N-INS-09106-10014, Maintenance of Air Conditioning and Refrigeration Equipment

c) At Pickering Nuclear, Common Services Operators shall identify each item or container using the Chemical Waste Bar Coding System to identify and track the processing of Oil and Chemical Waste (refer to P-MAN-79000-00001, Chemical Waste Bar Coding System).

d) Waste Generators are directed to use the following documents to process Conventional Solid Waste at Pickering and Darlington Nuclear:

- D-INS-79000-10002 Waste Disposal Guidelines for Solid Waste and Recyclables at Darlington
- P-PROC-WM-0002 Disposal of Conventional Solid Waste and Recycling

e) Nuclear Civil Maintenance – Waste Handling utilize the following document to process Oil and Chemical Waste originating from inside the Protected Area at Darlington:

- NK38-SMP-79500-03 Collection, Sampling and Shipping of Chemical Waste

f) Nuclear Civil Maintenance – Waste Handling utilize the following documents to process Conventional Solid Waste and Recycling originating from inside the Protected Area at Darlington:

- NK38-SMP-79500-04 Processing of Inactive Landfill Waste and Recyclable Materials
- NK38-SMP-79600-03 Collection of Zone 2 and Zone 3 Wastes

g) Management of hazardous waste (not including radioactive wastes) at the Western Waste Management Facility is outlined in W-INS-07080-00001, Management ofWestern Hazardous Waste Staging Area.

1.3.6 Additional RG Requirements for Waste Management – *RG Only*

RG maintains additional guidance for management of waste in the form of manuals, in combination with local instructions. The manuals are available on the Environment intranet page, and local documentation is updated in accordance with business needs. RG staff shall be familiar with and follow site-specific waste management processes where applicable.

1.4 Transportation of Dangerous Goods

The transportation of dangerous goods (TDG), including handling and offering for transport, is regulated by the federal Transportation of Dangerous Goods Act and TDGR.

1.4.1 Waste Shipping – Non-Radiological

TDG regulations do not distinguish between waste, new or unused dangerous goods. It is the responsibility of the shipper to correctly classify the dangerous goods and provide the carrier with a completed shipping document. The waste manifest is sufficient to serve as the shipping document. TDGR information describing the waste (i.e., UN Number, Classification, Packing Group, etc.) must be included in the manifest provided to the carrier. TDGR safety marks must be applied to all containers and /or vehicles in accordance with the requirements of the regulations.

TDGR require that all employees who handle, transport, or offer to transport dangerous goods be adequately trained, or work under the direct supervision of a trained person, within the scope of their responsibilities. OPG must issue certificates of training which are valid for 36 months, after which the employee must be retrained.

1.4.1.1 Equivalency Certificates

(a) Equivalency certificates allow the certificate holder to handle, offer for transport, transport, or import *dangerous goods* in a way that is not consistent with the TDG Regulations. The applicant shall apply for the equivalency certificate following the information requirements in Section 14 of the TDG Regulations and shall demonstrate that the transportation activity will be conducted in a manner that will provide a level of safety at least equivalent to the TDG Regulations.

(b) OPG utilizes two equivalency certificates as listed in Table 1, Equivalency Certificates Used by OPG.

(c) Generally, the equivalency certificates expire in two (2) years. Environment shall ensure the equivalency certificates that are used by OPG are renewed on time.

(d) If applicable, the equivalency certificate number shall be shown in the shipping documentation.

(e) It is acceptable to use either OPG's or the *carrier*'s equivalency certificate number depending upon who performed the packaging.

Table 1. Equivalency Certificates Used by OPG

No.	Certificate No.	CD No.	Certificate Holder	Description
1	SU 6155	OPG-CERT-07060-0001	The Canadian Electricity Association	Polychlorinated Biphenyls (UN 2315)
2	SU 8315	OPG-CERT-07060-0002	Ontario Power Generation Inc.	Batteries (UN 2794, 2795, and 2800)

Note that equivalency certificates are no longer obtained for aerosols. Aerosols are transported in accordance with TDG Regulations.

Additional information is contained within Appendix A, Additional Guidance on Transportation of Dangers Goods, and within the Transportation of Dangerous Goods Manual for RG, available on the Environment intranet webpage.

1.4.2 Waste Shipping – Radiological – *Nuclear Only*

Radioactive wastes are highly regulated and must be packaged, handled, stored and documented under the rules of the CNSC, specifically, the Packaging and Transport of Nuclear Substances Regulation SOR/2015-145, under the Nuclear Safety and Control Act. OPG provides additional training for the safe handling of these wastes and designates them as Class 7 Qualified Personnel.

Additional information is contained in W-PROG-WM-0002, Radioactive Material Transportation and W-PROC-WM-0033, Radioactive Shipments.

1.5 Polychlorinated Biphenyl Waste

PCB waste is any PCB material that has been taken out of service for the purpose of disposal. PCBs are governed by the Federal PCB Regulations (SOR/2008-273), Ontario Regulation 362 and Ontario Regulation 347 (Schedule 4). The most recent amendments to the Federal PCB Regulations provide end-of-use deadlines for equipment or products containing PCBs.

PCB waste material with a concentration greater than 50 parts per million (ppm) is subject to special handling and storage requirements under Regulation 362. These items are classified and shipped as 243D, PCB Waste. Sealed items (such as some ballasts and bushings) that cannot be readily or economically tested for PCBs may also be classified and shipped as 243D, PCB Waste.

PCB phase-out is underway across OPG. There are 2 OPG facilities used for PCB storage: Pickering Nuclear Generating Station and Cameron Falls Generating Station (RG Northwest Operations). The Federal PCB Regulations establish December 31, 2025, as the end-of-use date for equipment containing PCBs between 50 and 500 ppm. There is no end-of-use date specified for cables if they remain in place.

1.5.1 PCB Identification, Processing, and Storage

Management of PCB waste shall be conducted in accordance with regulatory requirements summarized in Table 2 below. Guidance on storage containers for PCB waste as well as spill and personal protection is provided in Appendix B.

Table 2. Regulatory Requirements for PCB Management

Type of PCB Waste Material	Identification, Processing and/or Storage Requirements
Lighting Ballasts	Refer to Appendix C, Identification of PCB Waste Lighting Ballasts Lighting ballasts with capacitors containing *PCBs* shall be segregated from *PCB* free ballasts.

Type of PCB Waste Material	Identification, Processing and/or Storage Requirements
	All lighting ballasts, which cannot be positively identified as *PCB* free, shall be treated as containing *PCBs*. Storage requirements of the federal PCB Regulations do not apply to quantities of PCB material less than 1 kg.This typically corresponds to **approximately 38 fluorescent lighting ballasts or less**, based on average ballast weight. Once this quantity is exceeded, the ballasts must be moved to a PCB waste storage site or disposed of in accordance with PCB Disposal Process outlined in the document. Sites may dispose of ballasts prior to accumulating 38 PCB fluorescent lighting ballasts, or combination of fluorescent and HID ballasts with total weight of less than 1 kg of pure PCBs.
Materials at or greater than 50 ppm	NOTE: Weight of *PCBs* in fluorescent lighting ballasts range from 23 to 37 grams. Weight of *PCBs* in HID lighting ballasts range from 91 to 386 grams Manage in accordance with: - MECP Director's Instructions - PCB Regulations – SOR/2008-273 - CCME Guideline - MECP Reg 362 - MECP Reg 347 -Place in PCB Storage Area. -Notify MECP of change of inventory. -Include in annual inventory report. -Maximum storage period is one year. -Items with a PCB content ≥ 50 ppm shall be placed in a PCB Waste Storage facility at one of the two (2) storage sites identified in section 1.5 within 30 days of being removed from service. -PCB material shall be destroyed using the PCB Disposal Process outlined in the document. -Use applicable MECP waste classes for PCBs on required Manifests. -Obtain Certificate of Destruction.
Materials between 2 ppm and 50 ppm	-Manage in accordance with PCB regulations – SOR/2008-273. -PCB material must be destroyed using the PCB Disposal Process outlined in the document.

a) PCB drums and storage facilities shall be properly labelled.

b) PCB inventory is tracked in accordance with local procedures. For Nuclear, N-FORM-10382 Polychlorinated Biphenyl Waste Inventory is used.

c) Access to PCB storage facilities for materials greater than 50 ppm shall be limited to authorized personnel. For Nuclear, N-FORM-11249, Polychlorinated Biphenyl Waste Site Entry Registry is located at the entrance of the facility and is completed upon entry to document the entry of authorized personnel to the facility, noting the name of the person(s) entering the area, the date, and the purpose of the entry. At Pickering, P-FORM-

20212 Pickering Nuclear PCB Storage Sites Access Register is used to record a list of all personnel on site who have been granted access to the storage site, and it is posted at the entrance to the facility.

d) Inspections of PCB storage facilities for materials greater than 50 ppm shall be performed by authorized personnel. For Nuclear, N-FORM-10345, Polychlorinated Biphenyl Waste Storage Facility Inspection shall be used to document inspections and findings.

Note: The PCB Management Manual for RG provides additional guidance and is available on the Environment intranet webpage.

Note: Any PCB waste that is radioactive is an exception to the regulations as radioactive wastes cannot be stored or destroyed under the regulations.

1.5.2 PCB Waste Disposal

1.5.2.1 Initiation of PCB Waste Disposal Process

Upon identification of an *item* that requires off-site disposal as PCB waste, the *Asset Owner* or delegate may perform the following activities:

(a) Prepare OPG-FORM-0101, PCB Waste Disposal Request.

(b) Forward completed OPG-FORM-0101, along with any supporting documentation, to the designated Site Environment Single Point of Contact (SPOC).

Note: Supporting documentation may include PCB test results, drawings, shipping dimensions, nameplate weights and oil volumes, photos, project or “milk run” schedule, and special site conditions.

(c) If not already in place, register the site as a waste generator for the waste class to be disposed.

Note: *Items* with a PCB concentration greater than 50 parts per million (ppm) are classified and shipped as 243D, PCB Waste. Sealed *items* (such as some ballasts and bushings) that cannot be readily or economically tested may be classified and shipped as 243D, PCB Waste. *Items* containing PCBs at less than 50 ppm are typically shipped as 252T, Waste Crankcase Oil and Lubricants.

Site Environment SPOC may perform the following activities:

(d) Review completed OPG-FORM-0101.

(1) If completed OPG-FORM-0101 is not acceptable, contact the *Asset Owner* or delegate for appropriate action.

(2) If completed OPG-FORM-0101 is acceptable, proceed to Section 1.2.

Note: The completed OPG-FORM-0101 initiates the PCB Waste Disposal File.

1.5.2.2 Arrangement for PCB Waste Pick-Up

Once OPG-FORM-0101 is deemed to be complete, the *Asset Owner* or delegate may perform the following activities:

(a) Forward OPG-FORM-0101 to the PCB disposal contractor.

(b) Contact the PCB disposal contractor to confirm they can meet the required dedicated pick up date, or obtain a tentative milk run pick up as appropriate.

(c) Provide e-mail confirmation to the Site Environment SPOC that arrangements with PCB disposal contractor have been made.

1.5.2.3 Preparation of Items for Disposal

The *Asset Owner* or delegate may perform the following activities:

(a) Ensure the *item* is prepared for disposal in accordance with the site's applicable waste management processes.

(b) Remove all OPG logos, information and identifying marks from the *item*.

(c) Prepare the *item* so that the PCB disposal contractor can drain it (if required) and that OPG can load the *item* on the PCB disposal contractor's vehicle/truck. Preparation may include:

(1) Safely removing accessories to minimize the size of items requiring special transport permits.

(2) Sealing all openings.

(3) Loading tall items on their sides, as required.

(d) Provide safekeeping, storage, staging, and material handling for *items* until removed from site.

(e) Act as a site contact for *items* requiring inspection by the PCB disposal contractor.

Note: OPG is responsible for review/verifying the Waste Manifest prepared by the PCB disposal contractor, and subsequently signing the Waste Manifest.

1.5.2.4 PCB Disposal Contract Administration

Site Environment SPOC may complete the following in order to develop and manage PCB disposal contracts.

(a) Specify front-end deliverables in the PCB disposal contract, which may include:

- PCB disposal contractor to supply Ministry of the Environment, Conservation and Parks Director's Instruction.

- PCB disposal contractor to prepare the waste manifest.

- Ownership title transfers to the PCB disposal contractor upon removal from the OPG site.

(b) Upon request, provide preliminary PCB disposal cost estimates to support business planning and project approval processes.

(c) Communicate disposal requirements to the PCB disposal contractor and confirm the PCB disposal contractor can meet all requirements.

(d) Resolve issues as they arise (e.g. changes in disposal requirements, or variances between OPG estimated quantities and PCB disposal contractor actual quantities reported).

(e) Review and approve PCB disposal contractor invoices and disposal documentation.

(f) Upon completion of the disposal, complete the *item's* PCB Waste Disposal File with attachments (invoice, OPG-FORM-0101, waste manifests, mass balance summary and certificates of disposal/destruction).

1.5.3 Management of in-service PCB equipment

In-service PCB equipment refers to oil-filled in-service power transformers, station service transformers, tap-changers, circuit breakers, pole-top transformers and bushings. For equipment where PCB levels cannot be determined without destructive testing, but where it is likely that equipment contain PCBs at levels requiring phase-out under the regulations based on history, data from manufacturers, and known PCB levels in related equipment, equipment should be treated as though PCBs are present. Where such assessments are inconclusive, sealed equipment should be presumed to contain PCBs at levels requiring phase-out under the regulations.

Records indicating PCB concentrations greater than 50 ppm in all oil-filled electrical equipment should be maintained for each facility and consideration should be given to add this information to local Emergency Preparedness and Response Plans.

1.5.4 PCB Storage Site Decommissioning

As PCB storage sites become redundant due to the phase-out of PCBs, storage sites shall be decontaminated and decommissioned in accordance with regulatory requirements.

1.5.5 PCB Decontamination

1.5.5.1 PCB Contaminated Electrical Equipment and Containers

a) PCB-contaminated electrical equipment and empty PCB containers (including drums and spill trays) shall be sent to an approved destruction facility.

b) If the decision is made to retain and decontaminate these containers or equipment on site, all required approvals and/or Director's Instructions from the MECP shall be obtained for these activities.

1.5.5.2 PCB Contaminated Storage Structures and Buildings

a) Any material or equipment that comes into contact with PCB waste shall be handled as PCB-contaminated unless decontaminated.

b) All contaminated cleaning material and potentially contaminated personal protective gear shall be treated as PCB waste.

c) All spills or leaks of PCB waste shall be dealt with in accordance with spill response and reporting requirements outlined in OPG-STD-0152, Spill Management and OPG-PROC-0041, Environmental Event Identification, Classification and Reporting.

d) Debris shall be thoroughly swept, cleared, and disposed of as PCB waste unless confirmed through sampling not to be PCB waste.

e) All waste generated from the solvent washing of PCB contaminated or potentially contaminated surfaces shall be managed as PCB waste.

f) Guidance for sampling of porous and non-porous surfaces is provided in Appendix D.

1.5.6 PCB Reporting

PCB reporting and record keeping shall be conducted in accordance with the requirements contained within Sections 33 through 42 of the Federal PCB Regulations, and other applicable legislation.

Notes:

1) Pickering Nuclear is subject to the following MECP Director's Instructions under Regulation 362: P-CORR-00541-00480 dated June 3, 1991 and P-CORR-00541–00481 dated July 16, 1996.

2) Cameron Falls Generating Station is subject to the MECP Director's Instructions letter CAMERON07-02 D1 PCB dated December 5, 1991.

1.6 Ozone Depleting Substances/Refrigerants

Ozone Depleting Substances (ODS) are regulated under both Federal and Provincial statutes.

a) The Federal Halocarbon Regulations SOR/2022-110 (FHR) apply only to *refrigerant*-containing equipment located at Pickering Nuclear, Darlington Nuclear, and the Nuclear Waste Management Facilities which are part of the "federal undertaking", specifically:

   i. The equipment is integral to any work or undertaking constructed for the development, production or use of nuclear energy.

   ii. The equipment is integral to the safe and secure production of nuclear energy including, but not limited to, the safe and secure operation of nuclear reactors.

   iii. The equipment is integral to the safe and secure storage of nuclear substances, including nuclear fuel and nuclear waste.

b) The Ontario Regulation 463/10 Ozone Depleting Substances and Other Halocarbons (O. Reg. 463) applies to all systems (federally and non-federally regulated), provided that compliance with O. Reg. 463 does not impair the core federal undertaking (see above definition).

In most respects, the federal Halocarbon Regulations are more stringent than O. Reg. 463. Non-nuclear facilities and nuclear facilities which do not form part of the federal undertaking follow O. Reg. 463. Refer to Appendix E for additional Nuclear-specific requirements for refrigerant-containing equipment.

Air conditioning and refrigeration equipment which falls subject to the aforementioned regulations, includes chillers, air conditioning units (window types, stationary self-contained unitized or split type packaged units), refrigerators, food freezers, vending machines, water-coolers, air dryers, and containers in which refrigerants are stored. These refrigerants include Chlorofluorocarbons (CFCs), Hydrochlorofluorocarbons (HCFCs) and Hydrofluorocarbons (HFCs).

1.6.1 ODS Phase-out and Storage

Purchase of HCFCs (excluding R-123) is prohibited as of 1 January 2020, unless the material was manufactured before this date. [Ozone Depleting Substances and Halocarbon Alternatives Regulations SOR/2016-137 s. 52]

Purchase of HCFC R-123 is prohibited as of 1 January 2030, unless the material was manufactured before this date. [Ozone Depleting Substances and Halocarbon Alternatives Regulations SOR/2016-137 s. 52]

Any refrigerant listed in Appendix F - List of Halocarbons Prohibited for Use is considered hazardous waste under Ontario Regulation 347 and shall be returned to wholesaler within 6 months of the collection in an approved container [O. Reg. 463 s. 35(2), 35(4)]. All requirements in O. Reg. 347 shall apply.

Note: If waste is retained longer than 90 days, as per Ontario Regulation 347 requirements, MECP shall be notified by the site waste management facility. The maximum storage period for waste refrigerants listed in Appendix F is six (6) months, as per O. Reg. 463.

Note: No person shall refill, charge or operate any air conditioning equipment, refrigeration equipment, or chiller equipment larger than 10 kg that contains a halocarbon listed in Appendix F List of Halocarbons Prohibited for Use. [FHR s. 12; O. Reg. 463 s. 26], unless the charge replaces a halocarbon that is recovered to service the system and the charge does not result in a net gain in the amount of halocarbon contained in the system. [FHR s. 12(2)]

1.6.2 ODS Qualifications and Maintenance

Personnel who install, service, leak test or charge refrigeration equipment, chiller, air conditioning equipment, or a container, or do any work that may result in the release of a refrigerant, shall hold current certification through the completion of a course approved by the MECP or under the certified person definition under the FHR, if applicable [O. Reg. 463 s. 22.1, 34(1); FHR s. 14].

Personnel shall perform maintenance activities in accordance with the Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems (herein referred to as the Refrigerant Code of Practice) [O. Reg. 463 s. 17].

In order to be considered a certified technician, maintenance personnel are required to obtain, and maintain an ODS handling certification (valid ODP card) as required under Provincial and Federal regulations.

1.6.3 Refrigerant Tags and Service Logs

Personnel shall document any maintenance performed on equipment, including servicing, leak testing, addition of refrigerant, removal of refrigerant, disposal of refrigerant, and disposal of equipment within an equipment service log. Permanent withdrawal of systems requires a notice by affixing a tag on the equipment indicating all halocarbon is recovered from the system. The tag and service log shall include information in accordance with applicable regulations [FHR s. 16, 23(1) and 23(2); O. Reg. 463, s. 23 (3)].

Copies of refrigerant tags and service logs shall be kept as records for five (5) years.

Note: For sites which fall subject to the FHRs, personnel responsible for a large refrigeration system, or container that contains or is designed to contain more than 10 kg of halocarbon or a small refrigeration system or container that contains or is designed to contain 10 kg or less of halocarbon, must maintain an activity log containing the information set out in Part 5 of Schedule 2 [FHR s. 23(1) and 23(2)].

1.6.4 Refrigerant Inventory

Sites which fall subject to the FHR, an inventory of large air-conditioning/refrigeration systems must be established and maintained containing the information set out in Part 4 of Schedule 2 [FHR s.22].

1.6.5 Use of Approved Refrigerant Containers

For sites which fall subject to the FHR, refrigerants shall be purchased, stored and transported in a container designed and manufactured to be refilled and to contain that specific type of halocarbon [FHR s. 6(1)].

For all sites, refrigerant containers shall be labeled in accordance with O. Reg. 463 s. 28(c).

For all sites, if a container no longer contains any refrigerant, a certified technician shall place a tag on the container and including the information specified in O. Reg. 463, s. 32.

1.6.6 Refrigerant Leak Testing

Leak testing shall be conducted by a certified technician in accordance with the Refrigerant Code of Practice and applicable regulations. For sites which fall subject to the FHRs, refrigerants that contain more than 10 kg of halocarbon shall be tested at least once every calendar year and no more than 15 months since the previous leak test [FHR s. 17; O. Reg. 463, s. 22(4)].

The FLM, Work Centre Manager, or other delegated accountable staff shall be notified of the results of the test [O. Reg. 463 s. 22(5)].

Note: For sites which fall subject to the FHRs, if a leak is detected, actions shall be initiated immediately to stop the leak within seven (7) days after the day on which a leak from the system is detected [FHR s. 18]

1.6.7 Removing or Adding Refrigerant

A certified technician shall recover, re-use or send for reclamation or dispose of all refrigerant removed from equipment in accordance with the Refrigerant Code of Practice. Refrigerant shall not be added to any equipment unless a leak test is performed, any detected leaks are repaired, in accordance with regulations [FHR s. 14 and 15(1); O. Reg. 463 s. 25(1)].

1.6.8 Refrigerant Permanent Withdrawal

No person shall dismantle, destroy, recycle, incinerate or dispose of by depositing in a dump or land filling site refrigeration equipment or a container that has contained a refrigerant unless a tag has been affixed to the discharged equipment by a certified technician [FHR s. 16(1); O. Reg. 463, s. 32(1)(2), 41(1)].

For sites which fall subject to the FHR, a certified technician shall remove all refrigerant from the equipment prior to dismantling or disposal of the equipment OR within one (1) year from date of permanent withdrawal [FHRs. 16(1)]. If the equipment may be required for future use, then certified technician should remove all refrigerant from the equipment within one (1) year from date of shutdown. If a refrigeration system of the FHR is permanently withdrawn from use, responsible persons who service or operate the system must affix a notice to the system or container [FHR s.16(1)].

For Nuclear, the tag located on the system is the notice, and this information must be consistent with the requirements of N-INS-09106-10014 Maintenance Of Air Conditioning And Refrigeration Equipment.

1.6.9 Reporting of ODS/Refrigerant Emissions

Releases in excess of 100 kg per incident shall be reported in accordance with OPG-PROC-0041 [FHR s. 24 (a, b); O. Reg. 463, s.19(2)].

A written report shall be provided to the MECP within 15 days of a release in excess of 100 kg from any system.

If a leaking refrigeration or air conditioning system has been charged to prevent an immediate danger to human life or health, then Facility Environment shall, within seven days, submit a written record to Director MECP indicating the information contained within O. Reg. 463 s. 25(3).

Refer to Section 1.6.10 for additional Nuclear requirements.

1.6.10 Additional Nuclear Requirements for ODS/Refrigerants – *Nuclear Only*

a) All air conditioning equipment, refrigeration equipment, and chiller equipment containing greater than 10 kg of halocarbon shall be tested at least once every calendar year and no more than 15 months since the previous leak test. [FHR s. 17] The person who identifies an overdue leak test shall ensure a Station Condition Record (SCR) is raised to document the overdue test. Additional notification may be

sent to Canadian Nuclear Safety Commission (CNSC) and Environment Climate Change Canada (ECCC).

b) FLM shall report to Facility Environment and document in a Station Condition Record when any of the following conditions exists:

- Mechanical damage to the air conditioning or refrigeration equipment caused by catastrophic component failure or external agents (e.g., accidental impact, fire, or vandalism).
- Improper operation, servicing, or testing (may constitute a reportable event or failure to promptly stop the leak).
- Improper handling, storage, or disposal of air conditioning or refrigeration equipment or refrigerant containers.
- Addition of over 10 kg (22 lb) of refrigerant to replenish a charge.
- Any event that results in a loss of refrigerant of over 10 kg (22 lb).

c) Facility Environment Manager shall:

- Report releases between 10-100 kg of refrigerant from federally regulated equipment to ECCC no later than July 31 for releases detected during the period that begins on January 1 and ends on June 30 of the same year; and no later than January 31 of the following year for releases detected during the period that begins on July 1 and ends on December 31 in accordance with N-PROC-RA-0005, Written Reporting to Regulatory Agencies. [FHR s. 25]
- Report releases in excess of 100 kg per incident within 24 hours after release is detected to the Spills Action Centre (verbally) in accordance with N-PROC-RA-0020, Preliminary Event Notification, [FHR s. 24 (a, b); O. Reg. 463, s.19(2)]
- Within 15 days of a release in excess of 100 kg from any system, provide a written report to MECP in accordance with N-PROC-RA-0005.
- Within 30 days of a release in excess of 100 kg from a federally regulated system, provide a written report to ECCC in accordance with N-PROC-RA-0005. [FHR s. 24(a, b)]

d) If leaking federally regulated refrigeration or air-conditioning system has been charged to prevent an immediate danger to human life or health, then Facility Environment shall also, within 7 days submit a written record to ECCC describing:

- The nature of the immediate danger to human life or health and the circumstances that justify charging the system in order to prevent the danger.
- The amount of halocarbon charged to the system.
- The date of repair of the leak or recovery of the remaining halocarbon from the system [FHR s. 11(2)].

1.7 Asbestos

Asbestos-containing materials are to be managed in accordance with OPG-PROC-0124 Health and Safety Management of Asbestos-Containing Material, which details health and safety requirements for specifying, purchasing, handling, installing, removing, replacing, storing and disposing of asbestos-containing material and presumed asbestos-containing material.

1.8 Assurance Processes for Management of Waste and Other Environmentally Regulated Materials

Waste management processes are periodically evaluated through environmental internal audits and compliance audits mandated by OPG-PROC-0044 Environment Health and Safety Audits and Assessments. Self-assessments of local waste management processes may also be conducted in the areas of generator registration reporting and classification, manifest record keeping, meeting training obligations, storage record keeping, PCB record keeping and reporting and effectiveness of corrective actions from previous audits.

1.9 Radioactive Waste Management – *Nuclear Only*

This standard specifies requirements for the management of low and intermediate-level solid and liquid waste. It does not address (a) irradiated nuclear fuel; (b) naturally occurring radioactive material; (c) technologically enhanced, naturally occurring radioactive material; (d) uranium mine and mill tailings; and (e) exempt waste.

Radioactive waste is defined as any material that contains a radioactive nuclear substance as defined in Section 2 of the Nuclear Safety and Control Act, and which the owner has declared to be waste. Radioactive waste is hazardous to all forms of life and the environment, and is regulated by the CNSC in order to protect human health and the environment.

Radioactivity naturally decays over time, so radioactive waste has to be isolated and confined in appropriate disposal facilities for a sufficient period until it no longer poses a threat. The time radioactive waste must be stored for depends on the type of waste and radioactive isotopes contained in the waste. Current approaches to managing radioactive waste have been segregation and storage for short-lived waste and near-surface disposal for low and some intermediate level waste.

Management of Low Level and Intermediate Level Radioactive Waste (LLW and ILW respectively) is governed by W-PROG-WM-0001, Nuclear Waste Management Program, which follows CSA standard N292.3-14 Management of Low and Intermediate-Level Radioactive Waste.

Any liquid waste (e.g. collected groundwater or surface water) shall not be discharged to land drainage works or connections to any sanitary sewer owned by the Regional Municipality of Durham, unless expressly authorized in writing by the commissioner, in accordance with Regional Municipality of Durham Sewer Use By-Law No. 55-2013.

Radioactive waste shipments to the Western Waste Management Facility (WWMF) and any location(s) acting as intermediate or alternative waste storage or disposal sites, shall comply with W-PROC-WM-0025, Waste Acceptance Criteria for Low & Intermediate Level Radioactive Waste and W-PROC-WM-0033, Radioactive Shipments, and all applicable legislation.

Local operational criteria are often specific to the OPG Nuclear location and are summarized in Appendix G – Site Specific Nuclear Waste Management.

2.0 ROLES AND ACCOUNTABILITIES

Accountabilities within this standard are structured according to top-level management. Unless expressly noted in this section, delegation to others within one's authority is permissible. Direct accountabilities of supporting staff may be established in site-specific waste management documentation. For facilities where the role of Site/Operations Vice President (VP) is not applicable, a designated project management authority/delegate may take on the responsibilities described in Section 2.3.

For Western Waste Management Facility roles and responsibilities refer to W-INS-07080-00001 Management of Western Hazardous Waste Staging Area.

2.1 VP Environment, Health & Safety

2.1.1 Ensures program is in place to manage wastes and other regulated materials at OPG sites and Real Estate-managed facilities in accordance with regulatory requirements.

2.2 VP Supply Chain

2.2.1 Provides resources, and services to dispose of surplus items that have market value.

2.2.2 Ensures adequate resources and facilities are available, and personnel are appropriately trained to handle, prepare for transport or receive regulated substances at sites.

2.2.3 Ensures the CANUTEC registration and the associated information are up-to-date.

2.3 Site VP – Nuclear; VP Operations/Regional Operations – RG; Director Facilities & Projects/Director – Corporate Real Estate

2.3.1 Ensures competent and adequate resources and facilities are available to execute the requirements of waste management processes at facilities that are under their operational control.

2.3.2 Ensures implementation of this standard within the facility-managed systems.

2.3.3 Ensures resource needs and applicable training are identified and managed.

2.3.4 Ensures preventative maintenance programs are in place with due regard for environment, safety, and health concerns related to refrigerants and other environmentally regulated materials.

2.3.5 Provides due diligence oversight on the maintenance requirements of this procedure.

2.3.6 Responsible for ensuring that tasks associated with management, reporting, and decommissioning of PCB storage sites are completed.

2.3.7 Arranges for scheduling of all maintenance, including leak tests, within the regulated period.

2.3.8 Ensures proper coordination, processing and disposal of waste and other regulated substances.

2.4 Director, Environment, Health & Safety (Nuclear and RG); Senior Manager, Environment, Health & Safety Corporate Programs (Real Estate-managed facilities)

2.4.1 Ensures that all regulatory requirements are identified in the program.

2.4.2 Ensures site implementation of waste management regulations and facility-specific guidance on environmental requirements.

2.4.3 Provides technical and regulatory assistance as required for waste management issues.

2.4.4 Reviews and approves regulatory reporting associated with the program.

2.4.5 Supports development and implementation of waste reduction and disposal strategies.

2.4.6 Ensures coordination of on-site and off-site chemical analysis.

2.5 Director Radiation Safety – Nuclear

2.5.1 Provides technical and regulatory assistance as required for radiation control issues.

2.5.2 Single Point of Contact for Radiation Protection Program.

3.0 DEFINITIONS AND ACRONYMS

3.1 Definitions

Asset Owner is the person requesting the disposal of PCB waste.

Carrier is a person who has possession of *waste and/or dangerous goods* while they are *in transport*. A *carrier* shall not take possession of a shipment of *waste and/or dangerous goods* unless they have been trained in waste in accordance with Ontario Regulation 347 and/or trained in TDGR, and are provided with a waste manifest or a TDG shipping document for the *waste and/or dangerous goods*.

Certified Technician is an individual in possession of a valid Ozone Depletion Prevention (ODP) card, certifying that they have received training with respect to the handling of ozone depleting substances, and refrigerants.

Condition Survey is an inspection of the interior of the *storage structure* or *building*. The objective of the inspection is to document the general condition including the location and severity of any internal corrosion or perforations, and the location of free oil or stains prior to any internal clean-up effort.

Consignor is a person within Canada who has possession of *waste and/or dangerous goods* named in the waste manifest and/or shipping document immediately before they are *in*

transport and/or imports, or who will import, *waste and/or dangerous goods* into Canada.

Container is a container that is designed and manufactured to contain a halocarbon for the purpose of storage or transportation.

Conventional Waste is waste product or a compound which is unsuitable for its original intended use. This includes items that are no longer of any value to the waste generator as well as items that can be recycled and sold.

Dangerous Goods are products, substances or organisms included by their nature or by the Transportation of Dangerous Goods regulations in any of the classes listed in Schedule 1 or 2 of the federal Transportation of Dangerous Goods Regulation.

Decommissioning (PCBs) is the process carried out when it has been determined the structure or building will no longer be used for the storage of PCB waste.

Decontamination (PCBs) is the removal of PCBs from equipment or material to a level specified in applicable regulations, instructions or guidelines, thus allowing the equipment or material to be disposed, recycled or re-used as PCB free.

Intermediate-Level Radioactive Waste (ILW) typically exhibits levels of penetrating radiation sufficient to require shielding during handling and interim storage. ILW generally requires little or no heat dissipation during its handling, transportation, and long-term management. However, because of its total radioactivity level, ILW might require consideration of the implications of short-term heat generation. Because of its long-lived radionuclides, ILW generally requires a higher level of containment and isolation than can be provided in near-surface repositories (i.e., more than 300 to 500 years).

In Transport is when a person has possession of *waste and/or dangerous goods* for the purpose of transportation or for the purpose of storing them in the course of transportation.

Inactive Waste is waste that has been confirmed to meet all defined OPG requirements that permit it to be released for disposal without radiological constraints (Nuclear Only).

Item is an all-inclusive term used to refer to contractual raw materials, parts, components, subassemblies, assemblies, equipment subsystems, systems, structures or finished product.

Large Air Conditioning System or Refrigeration System describes a system that consists of:

(a) a single refrigerant circuit that contains or is designed to contain more than 10 kg of halocarbon; or
(b) multiple refrigerant circuits one or more of which contains or is designed to contain more than 10 kg of halocarbon.

Leak Test or Leak Testing is any of a number of formal procedures for determining whether a system or container is pressure tight. The procedures may include subjecting the system or container to a positive or negative pressure and at the same time examining the pressure boundary for leaks.

Low-Level Radioactive Waste (LLW) contains material with radionuclide content above established clearance levels and exemption quantities, but generally has limited amounts of long-lived activity. LLW requires isolation and containment for periods of up to a few hundred years and does not generally require significant shielding during handling and interim storage.

Oil and Chemical Waste - Chemical compounds which are no longer of any value to the *Waste Generator*. These compounds are potentially hazardous to human health or to the environment due to their nature and require special disposal techniques. These include toxic, corrosive and/or flammable *waste*s.

Operating Island is the area at the Nuclear site delimited by the Security Fence. It is also an area established at each Nuclear site inside of which there are controlled plant structures, systems and components. This boundary usually encompasses the zoned areas of the plant.

Polychlorinated Biphenyl (PCB) is any liquid or solid with PCB contamination including equipment removed from service for the purpose of disposal and wastes generated from the clean-up of PCB materials.

Protected Area (PA) is the area at the Nuclear site delimited by the Security Fence. It is also an area established at each Nuclear site inside of which there are controlled plant structures, systems and components. This boundary usually encompasses the zoned areas of the plant.

Recyclable Waste – All waste materials for which there is a pathway available for the recycling of that material rather than disposal as landfill waste.

Refrigerant, in this document, is defined as any refrigerant or mixture of refrigerants containing chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), or hydrofluorocarbons (HFCs).

Small Air Conditioning System or Refrigeration System describes a system that consists of:

(a) a single refrigerant circuit that contains or is designed to contain 10 kg or less of halocarbon; or
(b) multiple refrigerant circuits each of which contains or is designed to contain 10 kg or less of halocarbon.

Storage Structure (PCBs) is any temporary storage container used for the storage of PCB wastes including metal shipping containers, trailers, etc. Structure may or may not be fully enclosed.

Subject Waste - Liquid industrial or hazardous waste as defined by the waste characterizations within Ontario Regulations 347 “General – Waste Management”.

Waste - Product or compound which is unsuitable for its original intended use.

Waste Generator – A facility, work group or individual whose equipment and/or operations are involved in the production, collection, handling or storage of waste.

Waste Manifest – A three-part electronic document which tracks the waste shipment from its’ origin to its collection and disposal site. Manifests are used to identify the type of waste being

shipped, overall volumes and the movements of the waste from generator to carrier to receiver to ensure that these wastes are managed appropriately. The three portions of the manifest are completed by the generator, the carrier, and the receiver.***Waste Storage Building*** is a permanent structure fully enclosed that has been used for the storage of waste.

3.2 Abbreviations and Acronyms

CANUTEC	Canadian Transport Emergency Centre
CEPA	Canadian Environmental Protection Agency
CFC	Chlorofluorocarbon
CNSC	Canadian Nuclear Safety Commission
ECCC	Environment and Climate Change Canada
EPRP	Emergency Preparedness and Response Plan
ERAP	Emergency Response Assistance Plan
FHR	Federal Halocarbon Regulations
GRR	Generator Registration Report
HFC	Hydrofluorocarbon
HCFC	Hydrochlorofluorocarbon
HWP	Hazardous Waste Program
ILW	Intermediate-level radioactive waste
LDR	Land Disposal Restrictions
LLW	Low-level radioactive waste
MECP	Ministry of the Environment, Conservation and Parks
ODP	Ozone Depletion Prevention
ODS	Ozone Depleting Substances
OPG	Ontario Power Generation
PCB	Polychlorinated Biphenyls
PPM	Parts per Million
RPRA	Resource Productivity and Recovery Authority
SCR	Station Condition Record
TDG	Transportation of Dangerous Goods
TDGA	Transportation of Dangerous Goods Act
TDGR	Transportation of Dangerous Goods Regulations

4.0 BASES, RECORDS AND REFERENCES

4.1 Bases

- Ontario Regulation 347 General – Waste Management

- Federal Consolidated Transportation of Dangerous Goods Regulations including Amendment SOR/2016-95
- Ontario Regulation 362 Waste management – Polychlorinated Biphenyls
- Federal Regulation SOR/2008-273 PCB Regulations
- The Federal Halocarbon Regulations SOR/2022-110
- Ontario Regulation 463/10 Ozone Depleting Substances and Other Halocarbons
- Ontario Regulation 406/19 On-Site and Excess Soil Management
- N292.03-14 Management of Low and Intermediate-Level Radioactive Waste

4.2 Records

The following records may be generated by use of this document and shall be registered in appropriate document management system in accordance with the following table. Note that the SCIs, RRCs, and Retention periods summarized below are reflective of the filing system for Nuclear facilities, and may vary for RG or Real Estate-managed facilities.

Record Created	Associated Form or Template Number	QA Record? Y/N	Filing Information/Retention (AIMS Type/Sub-Type)
Waste Disposal Plan	N-FORM-11155	N	File in accordance with N-GUID-01983-10001
Storage Site Decommissioning Plan	N/A	N	Indexed in AIMS Document Number: Facility-PLAN-07000.01-XXXXX Retention: P RRC: ENV-0008
Site Decommissioning Report	N/A	N	Indexed in AIMS Document Number: Facility-REP-07000.01-XXXXX Retention: P RRC: ENV-0008
PCB Waste Certificates of Destruction	N/A	N	Indexed in AIMS Document Number: Facility-CERT-07000.01-XXXXX Retention: P RRC: ENV-0008
Refrigerant Tag Cat ID 483521	N/A	Y	Original: On equipment Copy: Retained by Department RRC: ENV-0018 Retention: T-5
Semi-Annual Halocarbon Release Report	N/A	N	Indexed in AIMS Document Number: Facility-CORR-00521-5 Digit CD sequence number RRC: ENV-0004 Retention: P

Record Created	Associated Form or Template Number	QA Record? Y/N	Filing Information/Retention (AIMS Type/Sub-Type)
Refrigeration Equipment Jurisdiction Exception List	N/A	N	Indexed in AIMS Document Number: Facility-LIST-07081-5 Digit CD sequence number RRC: ENV-0004 Retention: P
Activity Log and Halocarbon Inventory List	N/A	N	Retained by department. Retention: P
Chemical Laboratory Waste Analytical Request	P-FORM-10123	N	File in accordance with N-PROC-OP-0017
Bill of Lading for TDG	N-FORM-11163	N	Retain by sites. RRC: SUP-0010 Retention: T-2
Checklist for Completing Bill of Lading for TDG	N-FORM-11164	N	Retain by sites. RRC: SUP-0010 Retention: T-2
ERAP Registration	N/A	Y	Indexed in AIMS Document Number: N-CORR-03730-XXXXXXX RRC: ENV-0004 Retention: P
Proof of Classification of Dangerous Goods	N/A	Y	Indexed in AIMS as part of Work Package SCI 07060 RRC: ENV-0005 Retention: T-5
Notification to ECCC of Installed PCB Inventory	PCB Inventory Form supplied by the MECP	N	Indexed in AIMS Document Number: Facility-FORM-07000.01-XXXXX Facility-FORM-00541-XXXXX RRC: ENV-0008 Retention: P
PCB Waste Disposal File, including, but not limited to: PCB Waste Disposal Request, OPG-FORM-0101 PCB Test Results PCB Contractor Invoice Certificates of PCB Decontamination, Destruction and/or Disposal Mass Balance Forms	N/A	N	Indexed in AIMS as part of Work Package Retention: P RRC: ENV-0008
Waste Manifests	N/A	N	Indexed in AIMS as part of Work Package Retention: P RRC: ENV-0008
PCB Waste Storage Facility Inspection	N-FORM-10345	N	File in accordance with N-STD-MM-0009
PCB Waste Inventory	N-FORM-10382	N	Retained by Department. Retention: T-2

Record Created	Associated Form or Template Number	QA Record? Y/N	Filing Information/Retention (AIMS Type/Sub-Type)
Nuclear PCB Site Entry Register	N- FORM-11249	N	Retained by Department. Document Number: Facility-FORM-07000.01-XXXXX RRC: ENV-0008 Retention: P
Written notification of changes in PCB waste inventory to MECP, ECCC and local fire department	PCB Inventory Form supplied by the MECP	N	Indexed in AIMS Document Number: Facility-FORM-07000.01-XXXXX Facility-FORM-00541-XXXXX RRC: ENV-0008 Retention: P
Annual Report to MECP	N/A	N	Indexed in AIMS Document Number: Facility-REP-07000.01-XXXXX Facility-REP-00541-XXXXX RRC: ENV-0008 Retention: P
Correspondence documenting the verbal notification informing the MECP of the initial establishment of the PCB Waste Storage Facility	N/A	N	Indexed in AIMS Document Number: Facility-CORR-07000.01-XXXXX Facility-CORR-00541-XXXXX RRC: ENV-0008 Retention: P
MECP Director's Instructions providing approval for each PCB storage facility	N/A	N	Indexed in AIMS Document Number: Facility-CORR-07000.01-XXXXX RRC: ENV-0008 Retention: P
Written approval from MECP for Interim Storage Facility	N/A	N	Indexed in AIMS Document Number: Facility-CORR-07000.01-XXXXX RRC: ENV-0008 Retention: P
Current MECP acknowledgement of Regulation 347 Generator Registration Report	N/A	N	Indexed in AIMS Document Number: Facility-CORR-07000.01-XXXXX RRC: ENV-0008 Retention: P
MECP Director's Instructions for draining or decontamination of wastes and equipment	N/A	N	Indexed in AIMS Document Number: Facility-CORR-07000.01-XXXXX RRC: ENV-0008 Retention: P
Facility sketch providing location of waste within the storage facility	N/A	N	Indexed in AIMS Document Number: Facility-DRAW-00541-XXXXX NK30-07000.01-XXXXX RRC: ENV-0008 Retention: P
MECP and ECCC Inspection Reports of PCB Storage Facility	N/A	N	Indexed in AIMS Document Number: Facility-REP-07000.01-XXXXX RRC: ENV-0008 Retention: P

Record Created	Associated Form or Template Number	QA Record? Y/N	Filing Information/Retention (AIMS Type/Sub-Type)
MECP written approval for siting of shipping containers	N/A	N	Indexed in AIMS Document Number: Facility-CORR-07000.01-XXXXX RRC: ENV-0008 Retention: P
Emergency Response Plan and proof of filing with local fire department	N/A	N	Indexed in AIMS Document Number: Facility-PLAN-07000.01-XXXXX RRC: ENV-0008 Retention: P

4.3 References

4.3.1 Performance References

OPG-FORM-0101, PCB Waste Disposal Request

OPG-PROC-0041, Environmental Event Identification, Classification, and Reporting

OPG-PROC-0081, Investment Recovery: Disposal of Surplus Assets

OPG-STD-0152, Spill Management

OPG-PROC-0044, Environmental Health and Safety Audits and Assessments

OPG-PROC-0160, Contractor Safety Management

4.3.1.1 RG

Waste Management Manual - available on the Environment intranet webpage

Transportation of Dangerous Goods Manual - available on the Environment intranet webpage

PCB Management Manual - available on the Environment intranet webpage

EOH-PROC-07300-0001: Waste Management – Eastern Operations Hydro Environmental Procedure

NWO-PROC-ADM-0005: Waste Management

NEO-PROC-07300-0001 Waste Management (Hazardous and Liquid Industrial)

NPG-07060-0001: Transportation of Dangerous Goods – Shipping Requirements Summary Chart (Job Aid)

NEO-PROC-07082-0001: PCB Management (Concentration In Electrical Equipment And Waste) – Neis #3-10

CAMERON07-02 D1 PCB Rev: 001: Environmental Approval - Pcb Storage - Cameron Falls Gs (Director's Instructions)

4.3.1.2 Nuclear

N-PROC-RA-0020, Preliminary Event Notification

N-PROC-MM-0036, Identification and Disposition of Surplus Inventory

N-PROC-RA-0014, Radiological Zoning, Personnel/Material Monitoring

N-PROC-RA-0005, Written Reporting to Regulatory Agencies

N-FORM-11155: Waste Disposal Plan

N-FORM-11249: PCB Waste Site Entry Registry

N-FORM-10345: PCB Waste Storage Facility Entry

N-FORM-10382: PCB Waste Inventory

N-INS-09106-10014, Maintenance Of Air Conditioning And Refrigeration Equipment

D-INS-79000-10000, Completion of Waste Manifests at Darlington Nuclear

D-INS-79000-10001, Waste Disposal Guidelines for oil and Chemical Waste at Darlington.

D-INS-79000-10002, Waste Disposal Guidelines for Solid Wastes and Recyclables at Darlington D-PROC-RA-0083, Radioactive Liquid Waste Handling

NK38-SMP-79600-03, Collection of Zone 2 and Zone 3 Waste

NK38-SMP-79600-02, Segregation and Sorting of Wastes

NK38-SMP-79600-06, Solid Active Waste Handling and Shipping

NK38-SMP-79600-04, Collection of Solid Active Waste – Type 1 TRF – HWMB

NK38-SMP-79500-07, Processing of Radioactive Oil for Acceptance at the Western Waste Management Facility

NK38-SMP-79500-08, Use of Solidification Agents for the Treatment of Radioactive Liquid Wastes

P-CORR-00541-00480, MOE Director's Instructions for PCB Waste Storage Site 30486a 022

P-CORR-00541-00481, MOE Director's Instructions for PCB Waste Storage Site 30486a 022

P-INS-79000-00010, Completion of Waste Manifests at Pickering Nuclear

P-FORM-20168, Checklist for Completing Waste Manifests

P-PLAN-09100-00001, Pickering Fire Safety Plan

P-PROC-WM-0002, Disposal of Conventional Solid Waste and Recycling

P-PROC-WM-0004, Requirements for Operations Involving Polychlorinated Biphenyls

P-PROC-WM-0006, Segregation and Handling of Low and Intermediate Level Radioactive Waste

P-AB-SMP-79100.04, Routine Collection of Zone 3 Waste

P-AB-SMP-79100.09, Zone 3 Waste Segregation, Sorting and Shipping

P-INS-79000-00006, Processing of Waste Oils – Operating Island

P-INS-79000-00007, Management of Small Waste Chemicals and Drummed Waste – Operating Island

P-FORM-20212: Pickering Nuclear PCB Storage Site Access Register

W-INS-07080-00001, Management of Western Hazardous Waste Staging Area

W-PROC-WM-0027, Waste Acceptance Criteria - Landfill

W-PROC-WM-0025, Waste Acceptance Criteria for Low and Intermediate Level Radioactive Waste

4.3.2 Developmental References

N/A

5.0 REVISION SUMMARY

This is a **non-intent** revision.

- Revised 1.2, 1.3.1, 1.3.2, 1.3.3, 1.3.4, the Waste Manifest definition and abbreviations and acronyms sections to clarify the Resource Productivity and Recovery Authority (RPRA) waste registration process (DCR 164212).

- Revised 1.6.7, 1.6.8, 1.6.9, the Records table and Nuclear references sections to update FHR references, add the Activity Log and Halocarbon Inventory List record and fix wording for clarity (DCR 162458).

- Updated a reference title in the Nuclear section (DCR 151901).

Appendix A:
Additional Guidance on Transportation of Dangerous Goods

A.1.0 SHIPPING DANGEROUS GOODS

(a) OPG personnel shipping *dangerous goods* shall follow the requirements of the TDG Regulations, which include but are not limited to meeting the requirements for means of containment, documentation, safety marks and labeling.

(b) The person who loads the transport vehicle is responsible for the proper loading, blocking, and/or bracing of the *dangerous goods* (as appropriate to the mode of transport) so as to, under normal conditions, prevent their accidental release (refer to Section 5.4 of the TDG Regulations).

A.1.1 NUCLEAR TDG SHIPPING AND RECEIVING

(a) Darlington (DN) warehousing staff shall follow the instructions specified in N-GUID-08173-10008 (Nuclear Warehousing Core Duties Guideline) when supporting the shipping bulk dangerous goods (i.e., hydrogen trailers) after delivery at site.

(b) DN Station Operations staff shall follow the instructions specified in NK38-OM-75300-04.06 (Changing Hydrogen Trailers) when shipping of bulk dangerous goods (i.e., hydrogen trailers) after delivery at site.

(c) DN Tritium Removal Facility Operations staff shall follow the instructions specified in NK38-OM-75330-04.05 (Swapping Hydrogen Trailers) when shipping bulk dangerous goods (i.e., hydrogen trailers) after delivery at site.

(d) Pickering (PN) staff shall follow the instructions specified in P-INS-09100-00009, Order Replenishment of Bulk Commodities (Chemicals, Fuels and Gases) when shipping bulk commodity from site.

(e) DN staff shall follow the instructions specified in D-INS-79000-10001, Waste Disposal Guidelines for Oil and Chemical Wastes at Darlington when shipping chemical waste from site.

(f) Western Waste Management Facility staff shall follow the instructions specified in W-INS-07080-00001 Management of Western Hazardous Waste Staging Area to manage sampling, storage, and disposal of hazardous waste from site.

(g) Warehousing staff shall follow the instructions specified in N-PROC-MM-0042, Nuclear Warehousing Core Duties.

(h) DN Operations staff shall follow the instructions specified in, NK38-WPM-08400.11-00001 sht: AIP-018, Bulk Supply Unloading, when receiving bulk shipments.

A.2.0 PICKERING STAFF SHALL FOLLOW THE INSTRUCTIONS SPECIFIED IN P-INS-09100-00009 ORDER REPLENISHMENT OF BULK COMMODITIES (CHEMICALS FUELS AND GASES).QUALIFICATIONS

(a) Anyone who handles, offers for transport or transports *dangerous goods* shall be adequately trained and have a valid Dangerous Goods Training Certificate or shall be in the presence of, and under the direct supervision of, a trained person (refer to Section 6.1 of the TDG Regulations).

(b) TDG training is specific to specified classes of *dangerous goods* and, as such, a "trained person" is only qualified to work with the classes of *dangerous goods* for which they were trained (e.g., "all classes except Class 7"). TDG Training Certificates (for road transport) are valid for 36 months (refer to Section 6.5 of the TDG Regulations).

(c) The training certificate shall be immediately presented to an inspector who requests it (refer to Section 6.8 of the TDG Regulations). It is also acceptable to keep a copy of the certificate in a central location (e.g., in a supervisor's office) provided that it can be made "immediately available".

(d) TDG training may be provided by internal or external organizations.

A.3.0 EMERGENCY RESPONSE ASSISTANCE PLAN

(a) As specified in Section 7 of the TDG Regulations, an Emergency Response Assistance Plan (ERAP) is required in instances where certain *dangerous goods* are being offered for transport above specified concentrations or quantities. An ERAP is only required for *dangerous goods* that are indicated in Column 7 of Schedule 1 of the TDG Regulations.

(b) A table top exercise of the ERAP plan shall be conducted annually.

Note: OPG Nuclear holds an ERAP (refer to N-CORR-03730-0551106, Emergency Response Assistance Plan for the Transportation of Bulk Hydrogen in Tube Trailers) for its outgoing hydrogen trailers from Darlington and Pickering stations [refer to section 1.6.1(b)]. The ERAP registration shall be renewed before 16-Feb-2022.

A.4.0 DOCUMENTATION

OPG Nuclear personnel (*consignor*) shipping *dangerous goods* from site shall complete the appropriate shipping document in accordance with the instructions provided below:

(a) The shipping document shall contain all the information required by Section 3.5 of the TDG Regulations. This includes but is not limited to the shipper's name and address, shipping date, the shipping name, primary classification, UN Number, packing group, 24-hour number for technical support, and a Consignors' Certification (Section 3.5(1) and 3.6.1 of the TDGR).

(b) The information on a TDG shipping document shall be easy to identify, legible and printed in indelible ink. When information relating to *dangerous goods* is on the same shipping document as non-*dangerous goods*, the *dangerous goods* information shall be shown first and further identified by either a heading "*Dangerous Goods*" or by an "X" (Section 3.4 of the TDGR).

(c) The *carrier* of *dangerous goods* shall ensure that a copy of the TDG shipping document is kept in a pocket mounted on the driver's door, or within the driver's reach. When the driver is out of the vehicle, the TDG shipping document shall either be in the driver's door pocket, on the driver's seat, or in a location clearly visible to anyone entering the vehicle through the driver's

door (refer to Section 3.7 of the TDG Regulations).

(d) If the *carrier* accepts an electronic copy of a TDG shipping document then they shall produce a paper copy to carry with the shipment (Section 3.2 of the TDG Regulations).

(e) A copy of any TDG shipping documentation shall be retained for two (2) years plus current.

(f) Amendments to the TDGR in 2014 (SOR/2014-152) require a shipper / consignor to be able to provide proof of classification available to the Minister on reasonable notice given by the Minister. Such a request could go back as far as five (5) years. A proof of classification is any document that explains how the dangerous goods were classified, which may include a test report; a lab report; or a Safety Data Sheet (refer to Section 2.2.1 of the TDG Regulations).

Note: For Nuclear, Warehousing staff (*consignor*) shipping *dangerous goods* shall prepare the shipping documentation including N-FORM-11163, Bill of Lading for TDG and N-FORM-11164, Checklist for Completing Bill of Lading for TDG. If a *carrier* (e.g., UTI Canada Inc.) is coordinating the shipment on behalf of OPG Nuclear, the *carrier* shall complete its own Bill of Lading (BOL).

A.5.0 REQUIRED INFORMATION ON A TDG SHIPPING DOCUMENT

(a) The requirements for TDG shipping documentation include Shipping name, Class, UN number, total quantity, packing group, 24 hour emergency response telephone number, date, name and address of the shipper, and a Consignors' Certification (refer to Section 3.5(1) and 3.6.1 of the TDG Regulations).

NOTE: For outgoing bulk hydrogen trailers (whether empty or full), the ERAP number of "ERP 2-0652" and the 24 hr emergency response number of "1-800-567-7455 Terrapure Activation Center" shall be included on the TDG BOL. For incoming hydrogen trailers, the supplier's ERAP number shall be used.

(b) OPG utilizes the Canadian Transport Emergency Centre (CANUTEC) services and contracted waste haulers to meet the specific requirement of the 24 hour emergency response telephone number.

i. The Director, Supply Chain Materials, Centralized Warehouse is responsible for annually reviewing and updating when required the services of CANUTEC. This can be done via CANUTEC on-line registration system.

ii. Any change to the information initially submitted to CANUTEC [e.g., consignor names, contacts, phone numbers, and Safety Data Sheet (SDS)] shall be communicated to CANUTEC immediately. Contact information shall be confirmed as still valid once per year and SDSs shall be updated every three (3) years even if there are no changes.

A.6.0 SAFETY MARKS

(a) Safety marks are the placards, labels and package markings which identify *dangerous goods* shipments. Anyone who offers for transport, transports or imports a means of containment that contains *dangerous goods* shall display the safety marks required by the TDG Regulations (refer to Section 4.1 of the TDG Regulations). The *consignor* (shipper) shall ensure that each package of *dangerous goods* is properly labelled and/or marked and all vehicles display the necessary placards.

(b) A large means of containment (as described in section 1.7.1, Large and Small Means of Confinement below) shall not be packed or loaded with *dangerous goods* until after the means

of containment displays the safety marks that are required for those *dangerous goods* (refer to Section 4.3 of the TDG Regulations). Even if the *carrier* offers to provide the safety marks, the accountability for the proper safety marks still rests with the *consignor* (refer to Section 4.4 of the TDG Regulations).

(c) The *carrier* is responsible for displaying the proper safety marks on a large means of containment and ensuring that they remain displayed on both the large and small means of containment. The *carrier* shall also provide, display or remove safety marks if the requirements for them change while *in transport* (refer to Section 4.5 of the TDG Regulations).

A.7.0 LARGE AND SMALL MEANS OF CONTAINMENT

(a) The specific requirements for size, orientation and placement of labels, placards and UN numbers for both large and small means of containment can be found in Sections 4.7 and 4.8 of the TDG Regulations.

(b) A large means of containment has a capacity of greater than 450 litres. Placards representing the various chemical hazards shall be placed on all four sides of large means of containment or transport units to support *dangerous goods* shipments. A placard and a UN number shall be displayed for a large means of containment if the *dangerous goods*:

- Are in quantity or concentration for which an ERAP is required
- Are included in Class 7 (Radioactive Materials) for which a Category III Yellow Label is required
- Are in a liquid or gas which is in direct contact with the large means of containment
- Have a total gross mass greater than 500 kg
- Are included in Class 1.1, 1.2, 1.3 or 1.5 and are:
  - Not subject to special provision 85 or 86 and exceed 10kg net explosive quantity
  - Subject to special provision 85 or 86 and the number of articles exceeds 1,000 (refer to Section 4.15 of the TDG Regulations).

(c) When several different *dangerous goods* are transported together within a large means of containment, the display of primary classification placards and UN numbers is regulated according to Section 4.15 of the TDG Regulations.

(d) A small means of containment has a capacity of 450 litres or less. A small means of containment shall display the *dangerous goods* shipping label(s), the shipping name, the technical name (if applicable) and the UN number of the product (refer to Sections 4.10 to 4.12 of the TDG Regulations).

A.8.0 REPORTING ACCIDENTAL OFF-SITE RELEASES

(a) In the event of an accidental or imminent accidental release of *dangerous goods*, the person who has possession of the *dangerous goods* shall make an immediate report if the released materials exceed the quantities listed in Table A1. Accidental Release Reporting Requirements (refer to Section 8.1 of the TDG Regulations).

(b) Immediate reporting shall be made in accordance with OPG-PROC-0041, Environmental Event Identification, Classification, and Reporting and N-PROC-RA-0020. Where a *carrier* has control of a shipment, OPG Nuclear employees shall ensure that the *carrier* has performed the immediate reporting, when required.

Table A1. Accidental Release Reporting Requirements

Class	Packing Group or Category	Quantity
1	II	Any quantity
2	Not Applicable	Any quantity
3, 4, 5, 6.1 or 8	I or II	Any quantity
3, 4, 5, 6.1 or 8	III or without packing group SOR/2019-101	30 L or 30 kg
6.2	A or B	Any quantity
7	Not Applicable	A level of ionizing radiation greater that the level established in section 39 of the "Packaging and Transport of Nuclear Substances Regulations, 2015"
9	II or III, or without packing group	30 L or 30 kg

Appendix B:
Guidance on PCB Waste Storage Containers and Spill and Personal Protection

PCB Liquids

- Drums - 205 litre capacity or less, closed head double bunged, 16 gauge steel or heavier and epoxy lined. Catalogue Identification Number (CAT ID) 38159.
- Maximum fill capacity of containers is 90 percent of the volume of the container.
- Store small quantities of PCB liquids placed in small containers in solid type drums as long as these liquids are bulked prior to shipping.

PCB Solids

- Drums - 205 litre capacity or less, 18 gauge steel or heavier, epoxy-lined with a removable steel lid and PCB resistant gasket (CAT ID 38155).

PCB Equipment

- Drums as noted above, or metal trays with capacity of twice the volume of the largest container of PCB liquids, or twenty-five percent of the total liquid in all the containers within the containment area, whichever is greater.

Overpack Drums

- Drums of PCB solid or liquid waste that are leaking or corroded to the point where their containment integrity is at risk shall be over-packed.

Spill and Personal Protection

Category #	Description	Quantity
Chemical Resistant Coveralls		
341713	Coverall, Chemical Resistant, Medium, Saranex	2
341714	Coverall, Chemical Resistant, Large, Saranex	2
314716	Coverall, Chemical Resistant, Extra Large, Saranex	2
Full Face Shield Respirator		
338641	Ultra-Twin Medium Size	2
338642	Ultra-Twin Large Size	2
Respirator Cartridges		
337121 24567	GMA-P100 Cartridges **OR** GMC-P100 Cartridges	6
Apron		
339691	Apron, Acid Protection 92 CM x 115 CM 7 OZ Neoprene	2
Disposable Coveralls		
NA	Tyvek, Large	2
Broom		
059758	Broom, Warehouse, Corn Heavy	1
059888	Alternate - Broom, Stable 405 x 88 MM Block, 137CM x 28MM Handle	1

Appendix C:
Identification of PCB Waste Lighting Ballasts

This appendix provides guidance for identification of waste fluorescent lighting ballasts and high intensity discharge (HID) ballasts (e.g., street lamps) with capacitors containing *Polychlorinated Biphenyl (PCBs)*.

C.1.0 IDENTIFICATION OF WASTE POLYCHLORINATED BIPHENYL LIGHTING BALLASTS

Prior to handling lighting ballasts, personnel shall ensure the following:

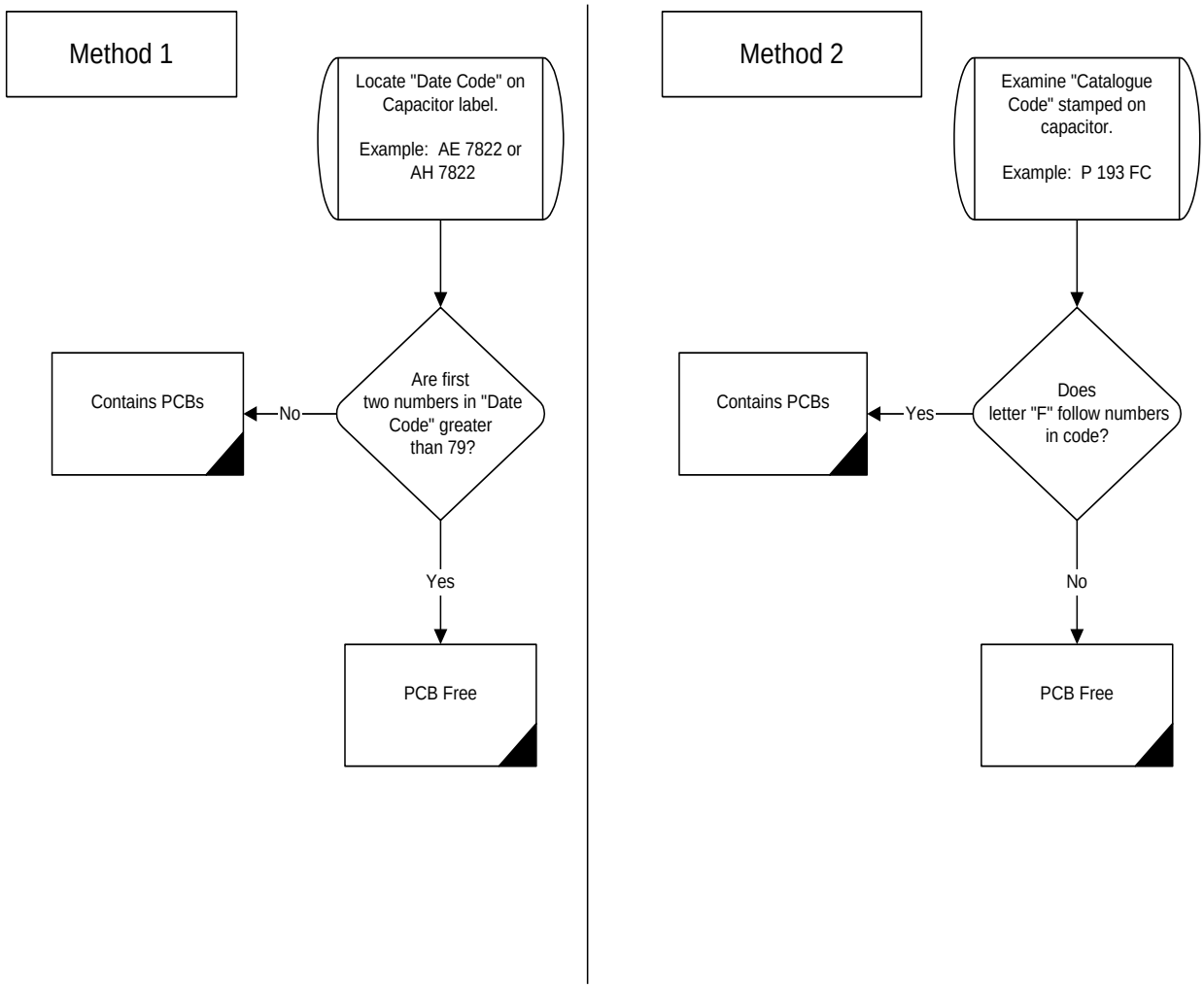
(a) Ballasts are de-energized and checked for leakage.

(b) If ballasts are leaking or potentially leaking, personal protective equipment shall be worn.

Lighting ballasts with capacitors containing *PCBs* shall be segregated from *PCB* free ballasts.

All lighting ballasts, which cannot be positively identified as *PCB* free, shall be treated as containing *PCBs*.

Use the following figures a guidance to determine whether lighting ballasts contain PCBs. For light ballasts from manufacturers other than those identified, assume that PCBs are present unless the unit is marked “non PCB”, “no PCB” or “PCB free” or is clearly dated 1980 or later.



Use one of the following two methods to determine if Aerovox Canada capacitors contain *PCBs*.

Figure C.1 Fluorescent Ballasts - Aerovox Canada Limited Capacitor

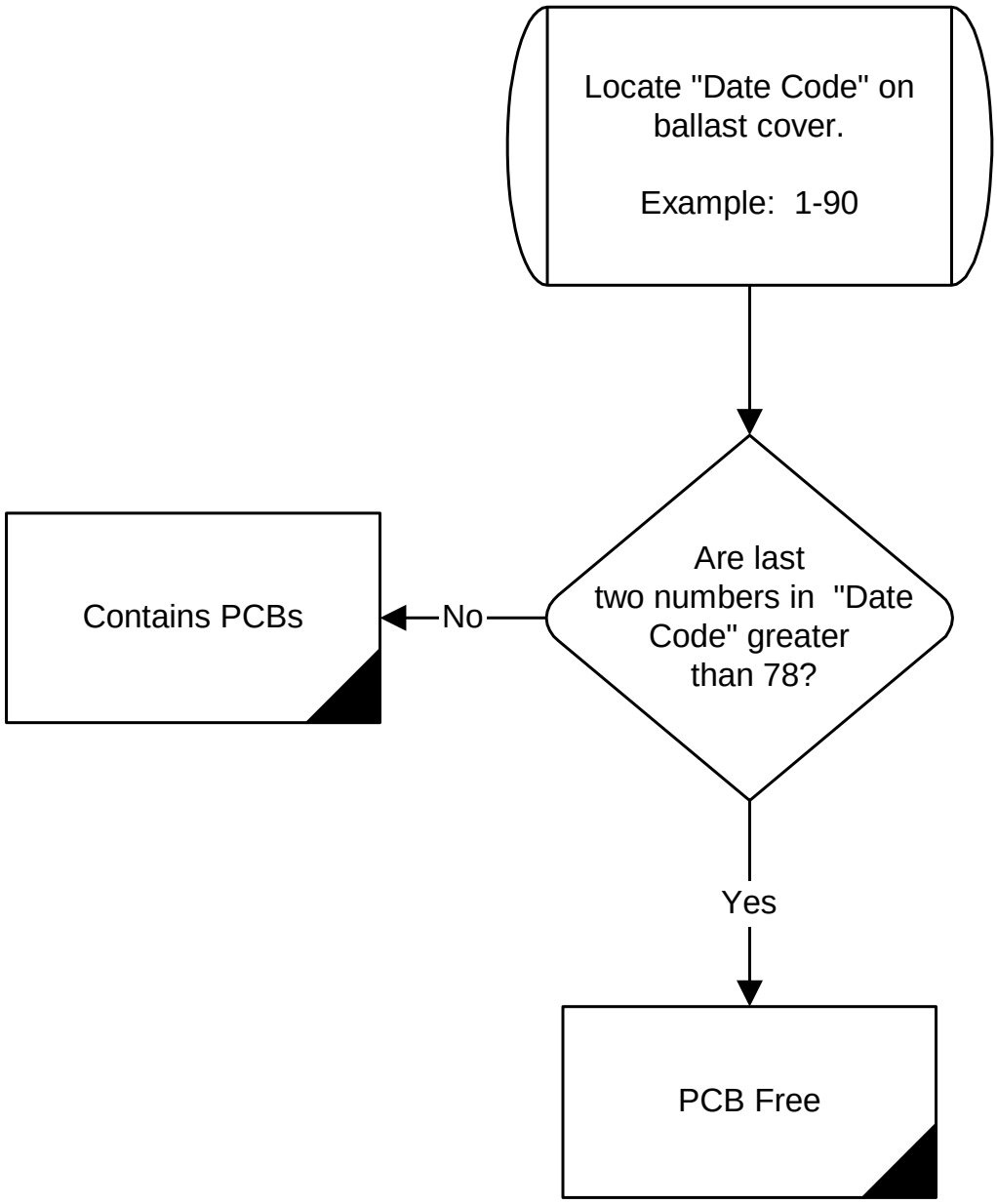
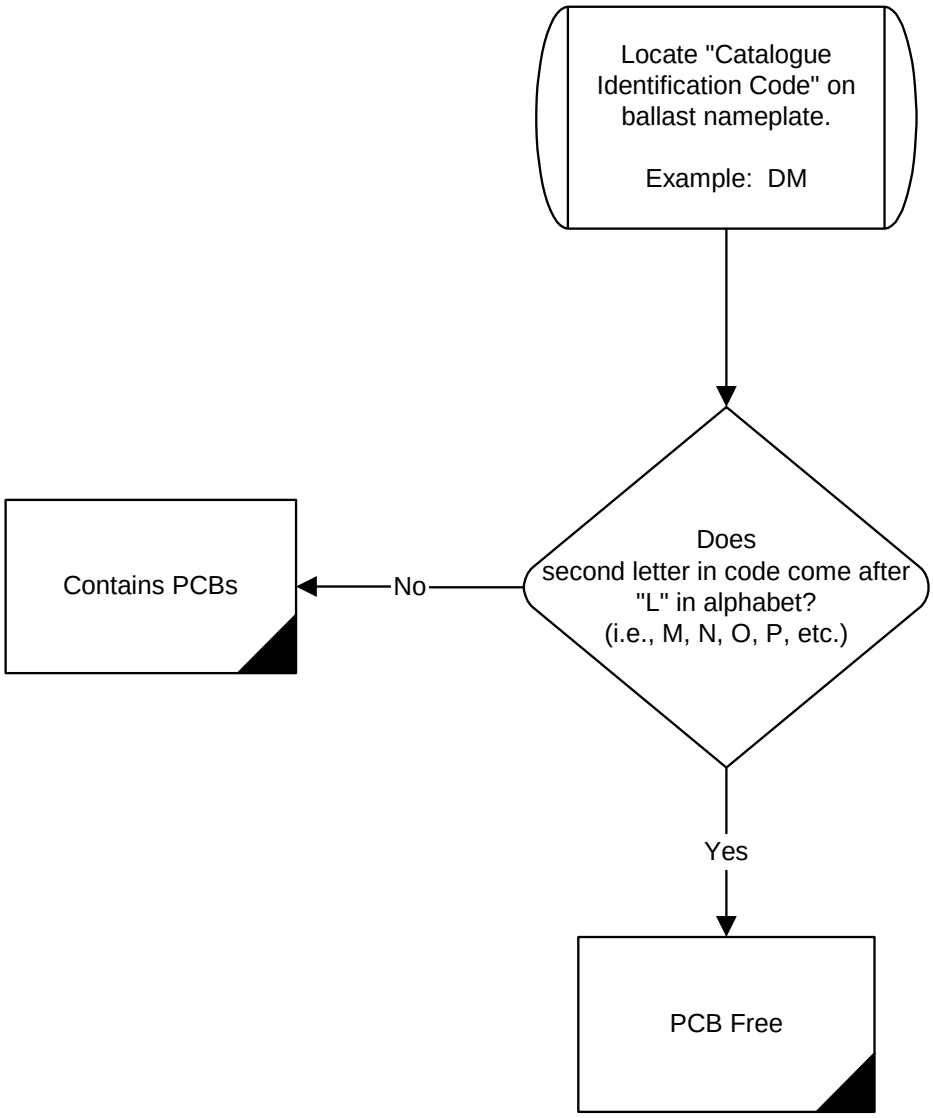


Figure C.2 Fluorescent Ballasts - Advance Ballasts (supplied by Phillips)



Allanson switched to non-*PCB* ballasts in 1980. Code described above is found on ballasts made before May 1987. Allanson Ballasts manufactured after May 1987 are *PCB* free and are marked “NO PCB”.

Figure C.3 Fluorescent Ballasts - Allanson Ballasts (Division of Jannock Limited)

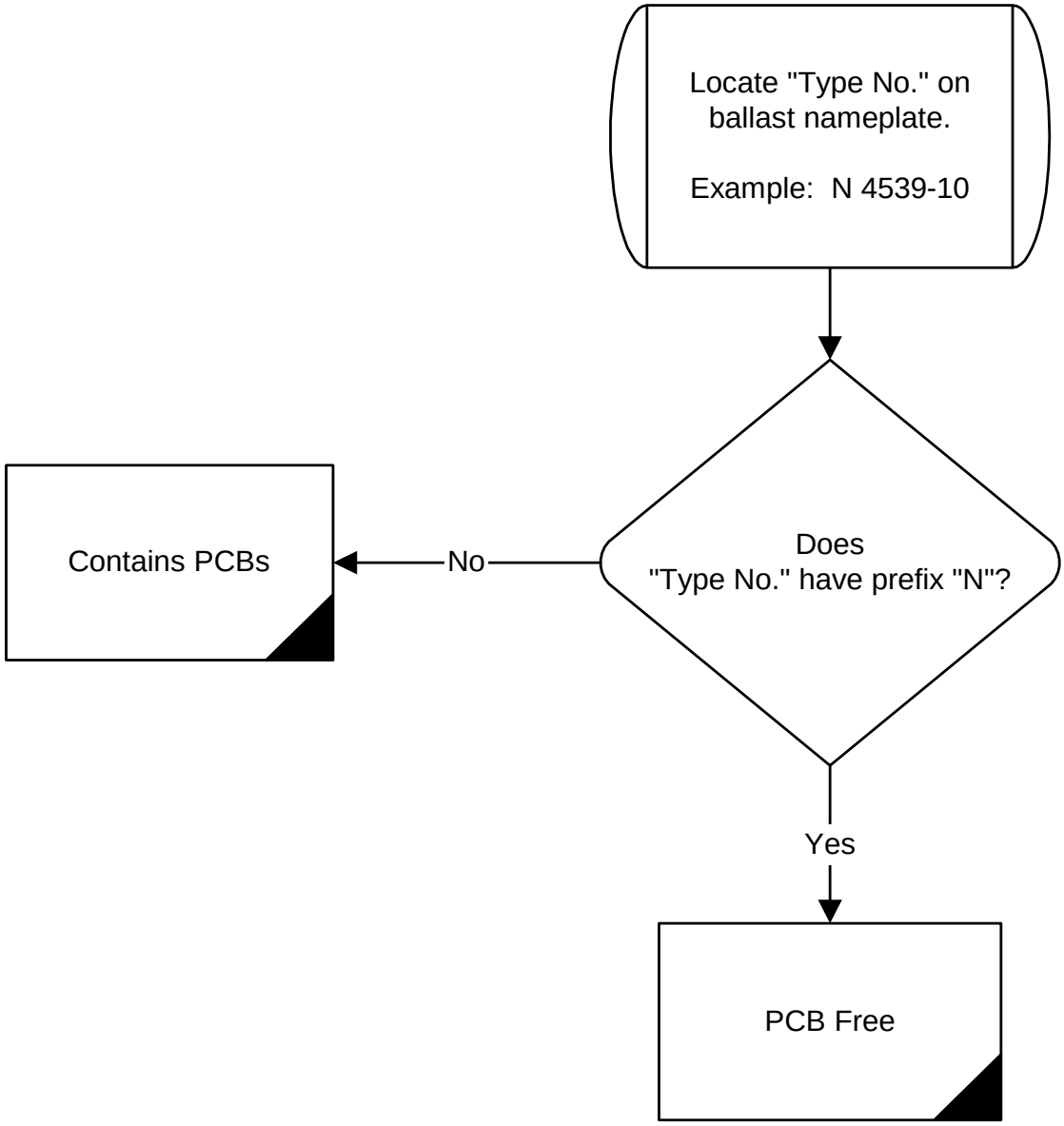


Figure C.4 High Intensity Discharge Ballasts - Allanson Ballasts (Division of Jannock Limited)

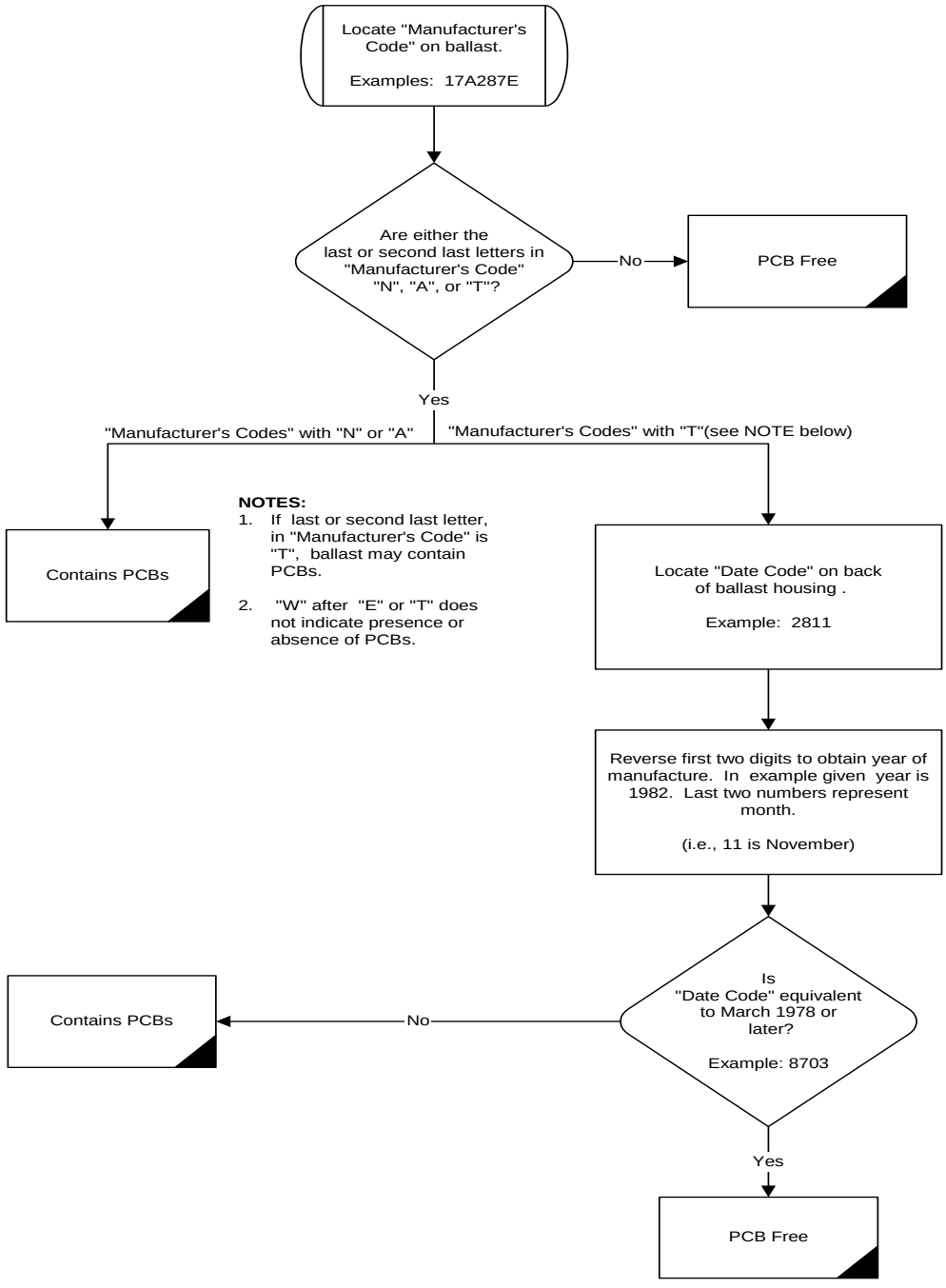
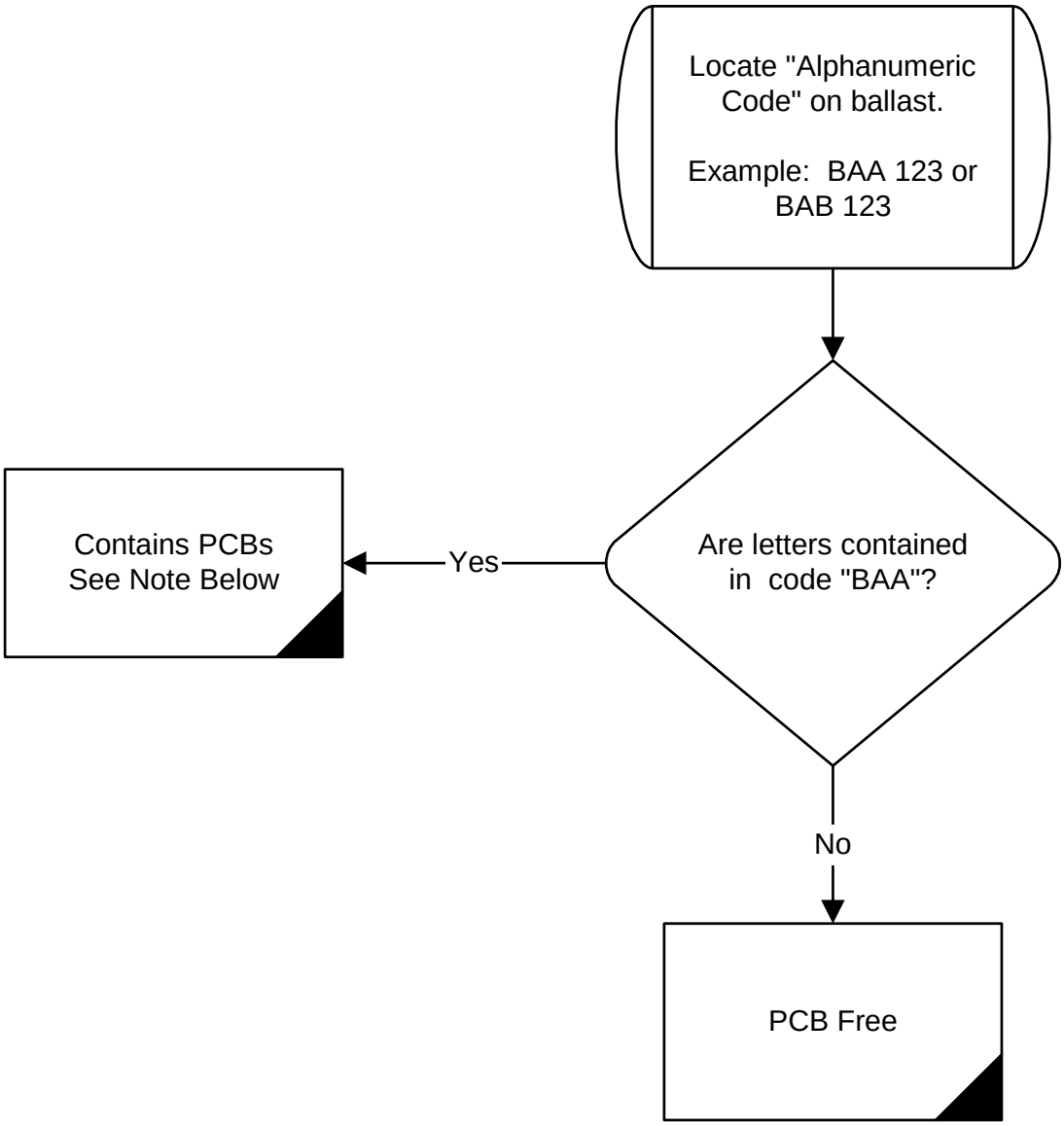
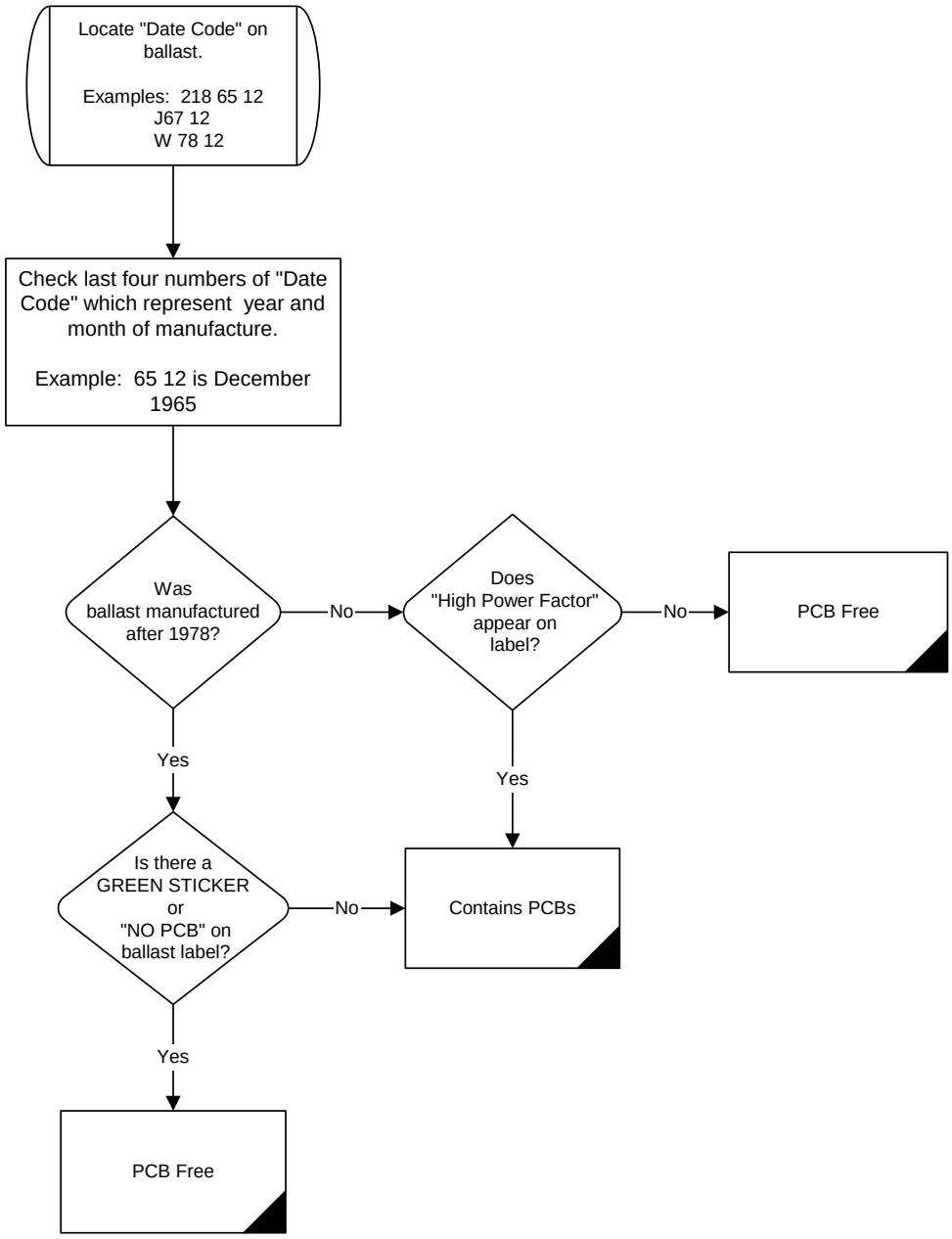


Figure C.5 Fluorescent and High Intensity Discharge Ballasts - Canadian General Electric Ballasts



Holophane manufactures only HID ballasts. Holophane ballasts with letters “BAB” in code are *PCB* free. Ballasts manufactured after 1980 are *PCB* free.

Figure C.6 High Intensity Discharge Ballasts - Holophane Canada Incorporated



Ballast manufactured by Magnatek Polygon after July 1980, are *PCB* free.

Figure C.7 Fluorescent and High Intensity Discharge Ballasts - Magnatek Polygon

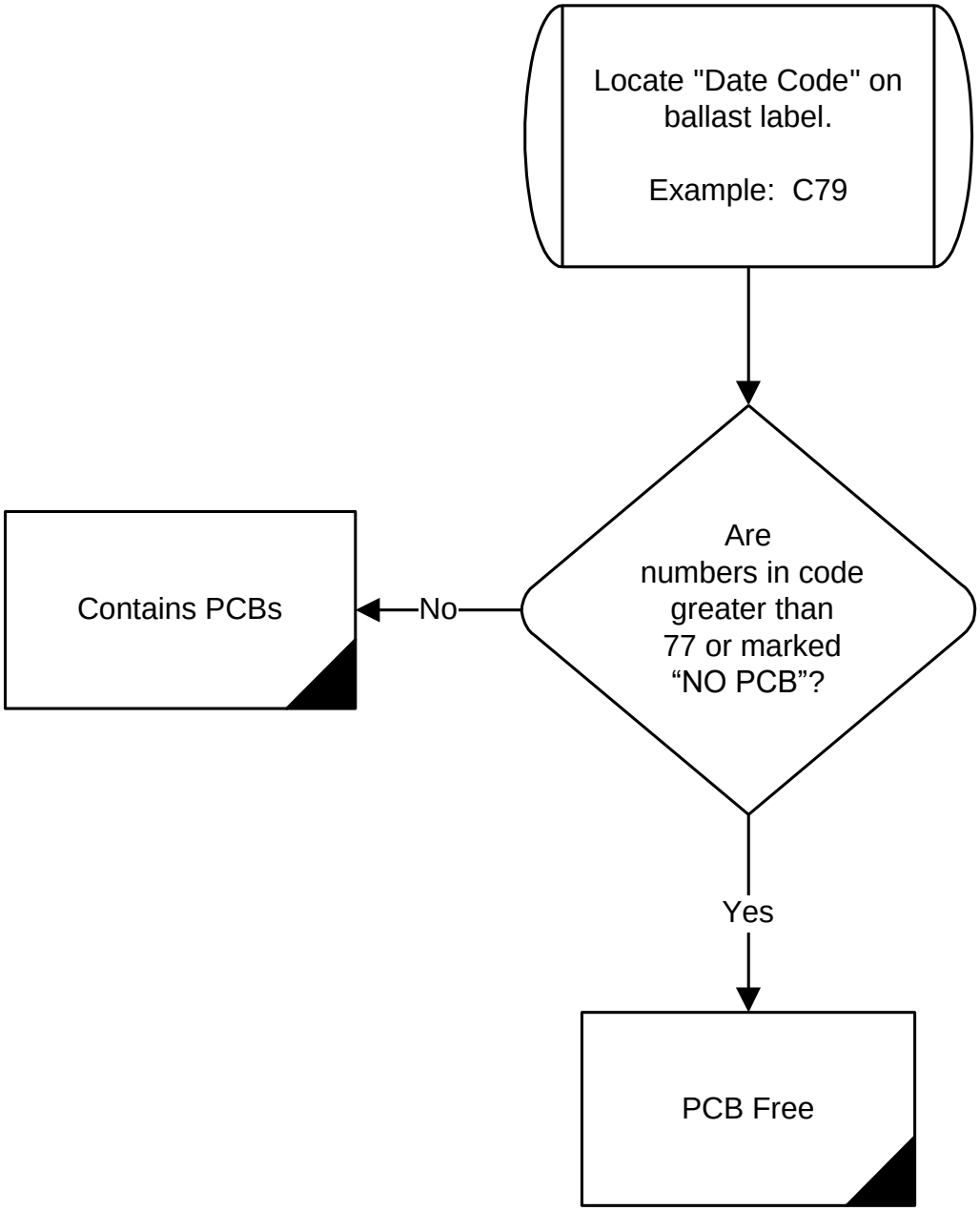
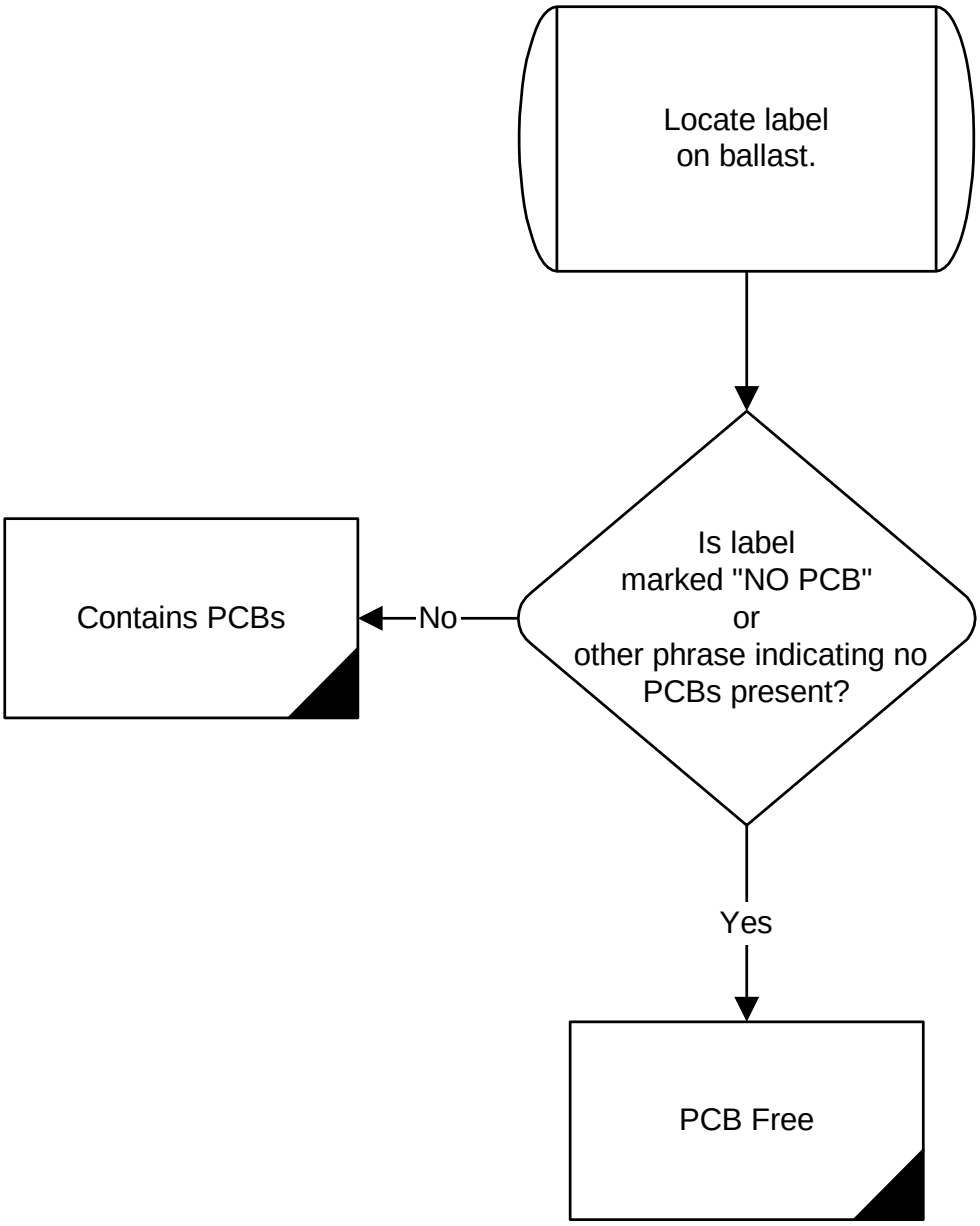
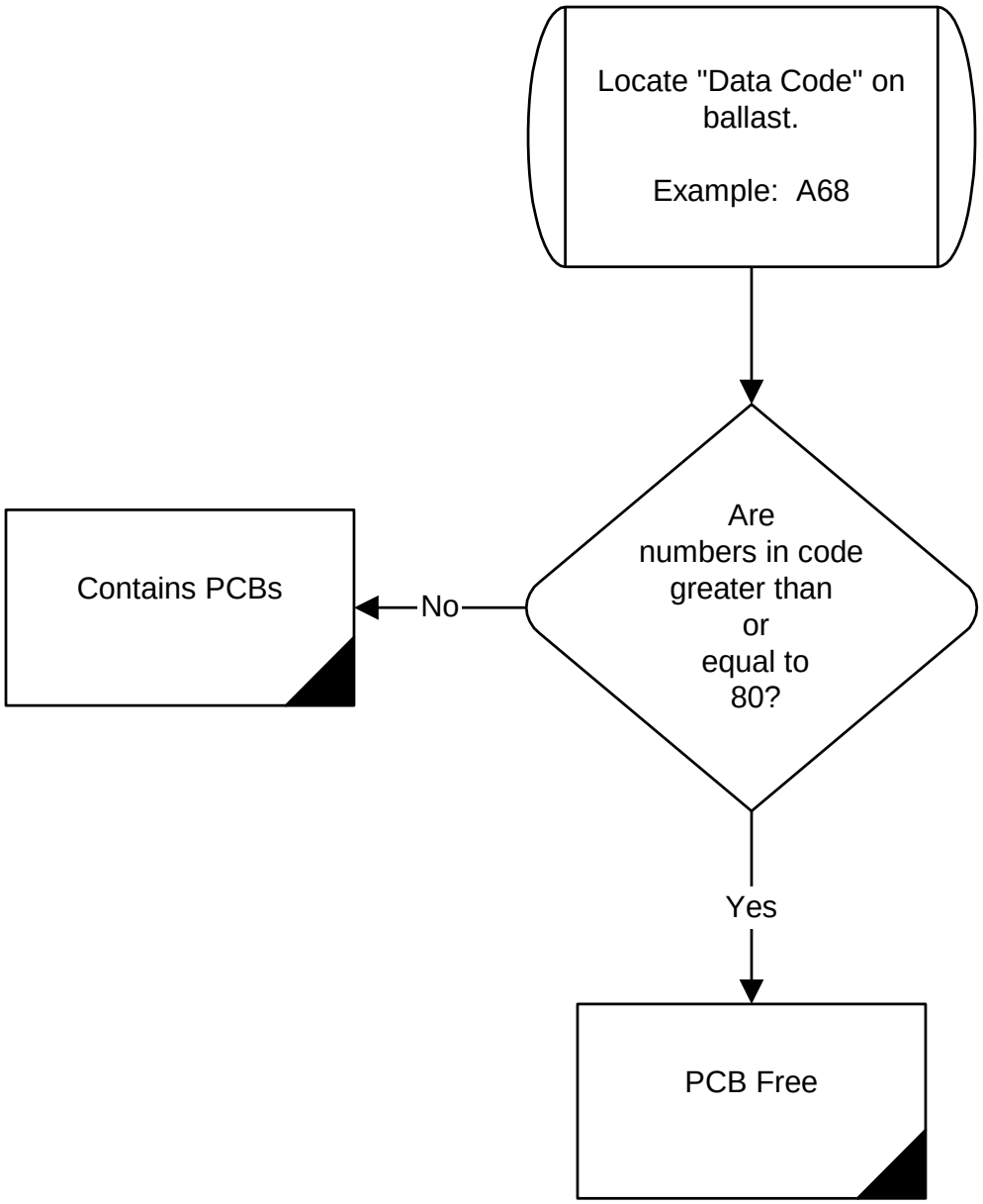


Figure C.8 Fluorescent and HID Ballasts - Magnatek Universal Manufacturing (USA)



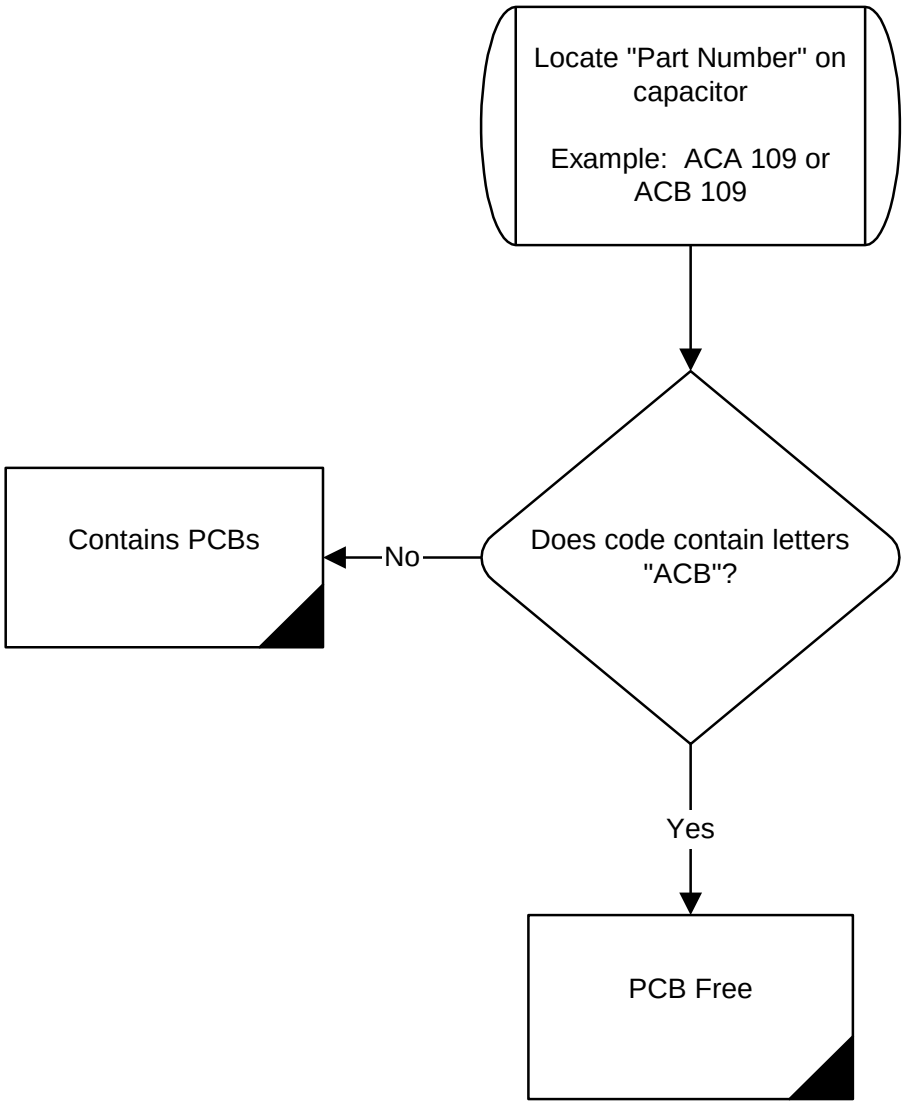
HID ballasts manufactured by Philips are clearly marked on capacitor, either *PCB* or non-*PCB*.

Figure C.9 Fluorescent Ballasts - Philips Lighting



Sola Canada ballasts manufactured before 1980 contain *PCBs* unless otherwise indicated on ballasts.

Figure C.10 Fluorescent Ballasts - Sola Canada



Method in Figure 10 also applies to HID ballasts, however additional method (Figure 11) may be used for HID ballasts.

HID ballasts containing letters ACA in code contain *PCBs*.

Figure C.11 High Intensity Discharge Ballasts - Sola Canada

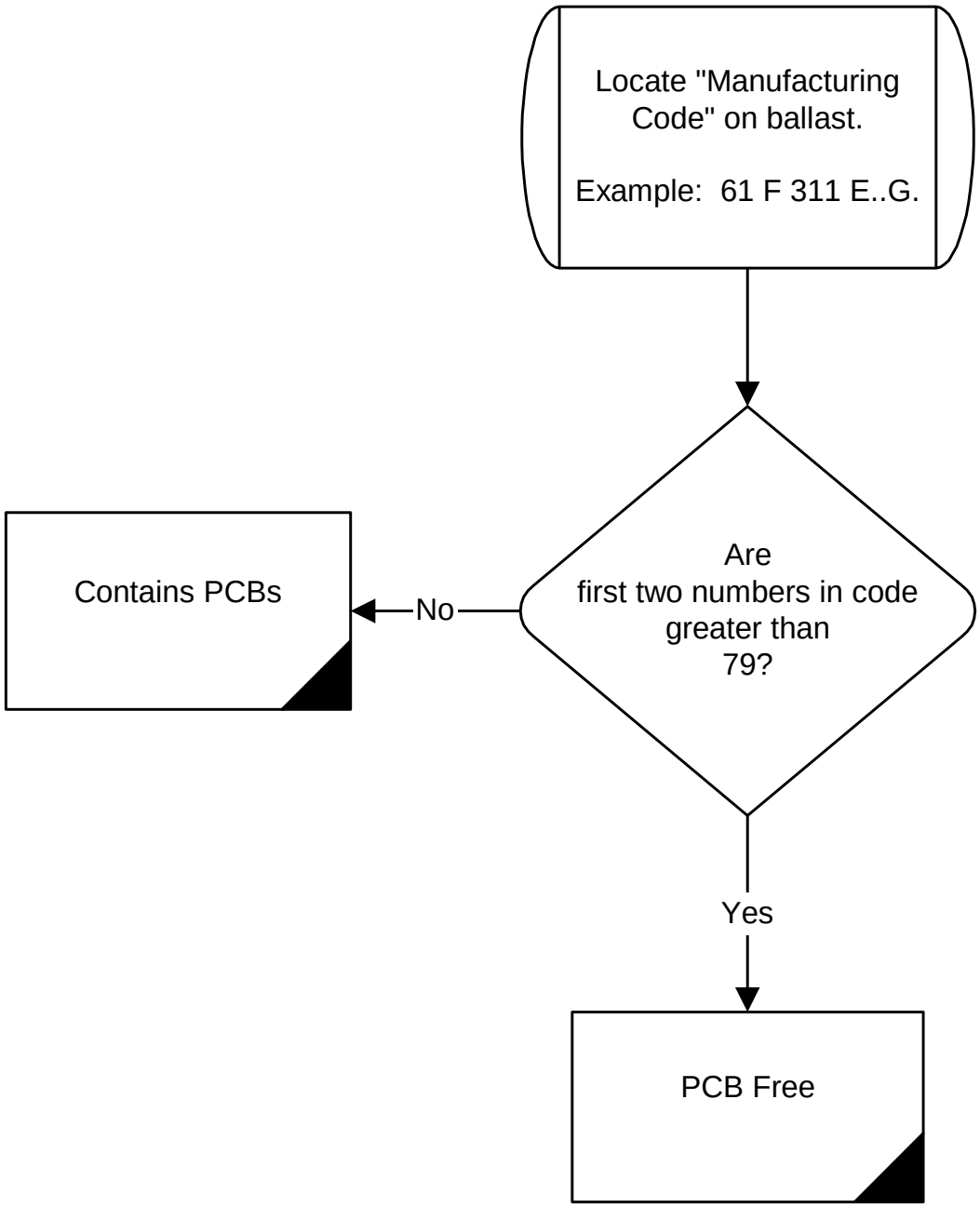


Figure C.12 Fluorescent Ballasts - Sola Electric (USA)

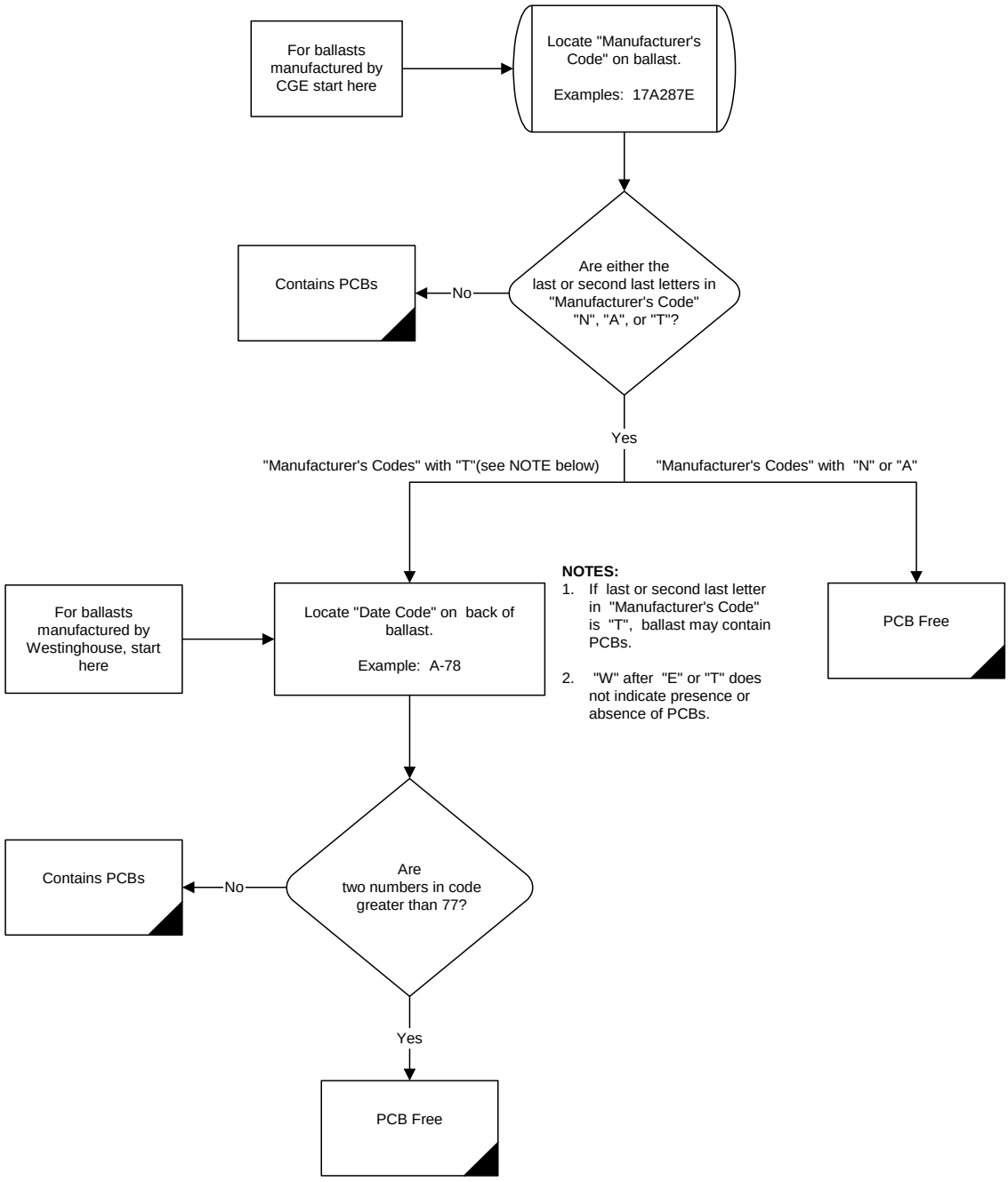


Figure C.13 Fluorescent Ballasts - Westinghouse Canada (including Westinghouse ballasts manufactured by Canadian General Electric)

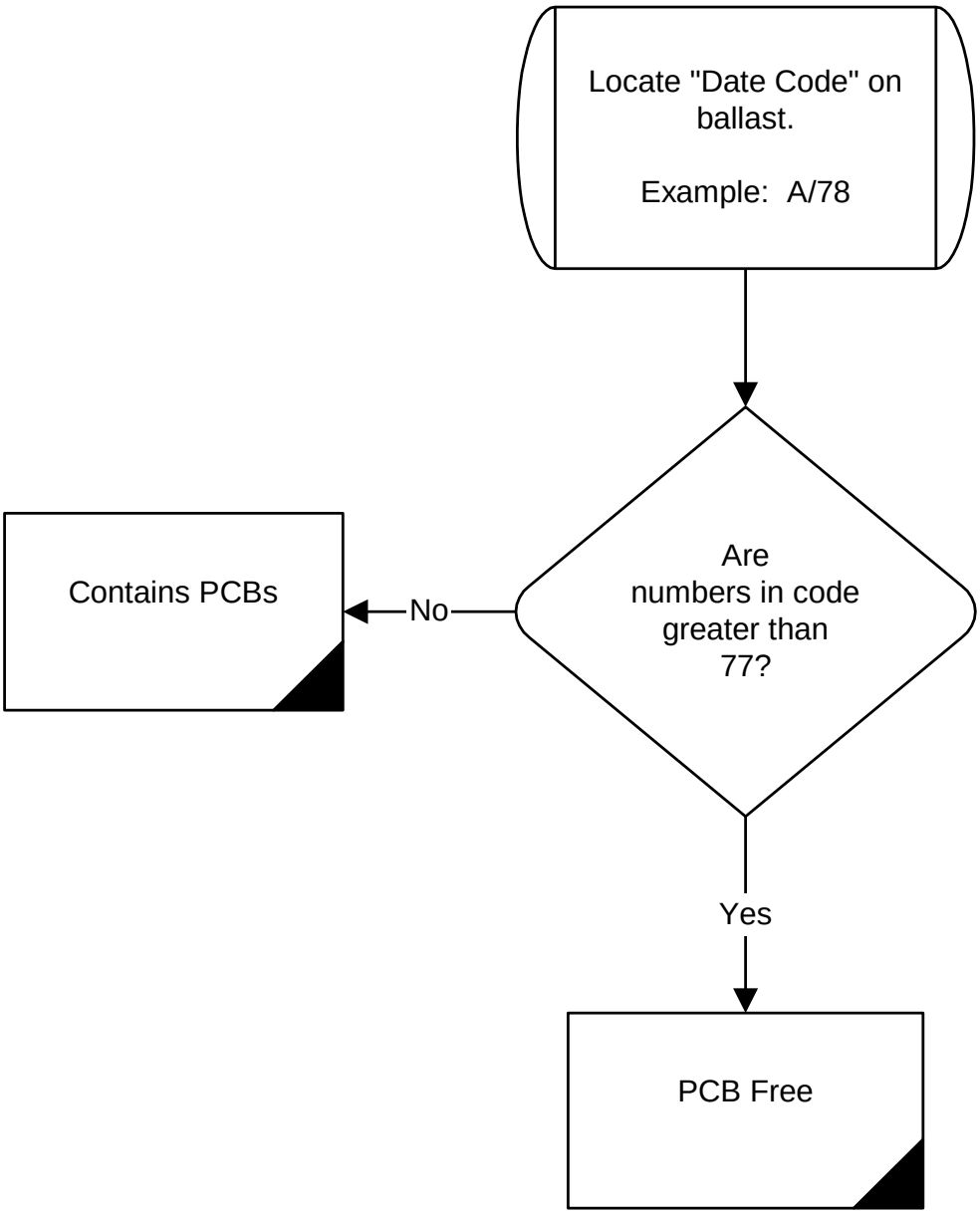


Figure C.14 High Intensity Discharge Ballasts - Westinghouse Canada

Appendix D:
PCB Sampling Guidance

D.1.0 SAMPLING NON-POROUS SURFACES

a) The sampling protocol to be used for non-porous surfaces (e.g., sealed concrete floors) shall be consistent with the Canadian Councils of the Ministers of Environment (CCME) Protocol for Sampling and Testing at PCB Storage Sites in Ontario, MOE 2000.

b) A wet wipe sampling protocol is recommended for the verification of PCB surface concentrations of less than 10 µg PCB/100 cm^2 on waste storage structures and building surfaces intended for non-PCB waste storage or for disposal.

c) Perform the wet wipe test sampling methodology as follows:

1) Composite samples consisting of 4 to 6 areas of 100cm^2 each shall be taken as follows:

i. Storage Structures: Composite samples of the following surfaces of each storage structure where there is the potential for PCB contamination:

- Top and side walls
- Bottom
- Bottom weld or joint seam (metal storage containers)
- Internal surface of door
- External surface of door
- Any known or suspected contaminated areas.

ii. Building Surfaces: Composite samples of the following surfaces where there is the potential for PCB contamination:

- Top and side walls (only if contamination known or suspected)
- One composite sample from each 15 m^2 area of impermeable floor surface
- Internal surface of door
- External surface of door
- Any known or suspected contaminated areas

2) Required sampling equipment is as follows:

- Prepared glass sampling jars each containing a gauze pad
- Disposable templates

- Latex gloves
- Markers and labels
- Container for disposing of used templates and gloves
- Metal forceps or tweezers
- Solvent – bottle of hexane with a pump burette

NOTE: Do not store the solvent in plastic bottles as PCBs may leach from the plastic and interfere with the sample results.

- Pre-cleaned 250-ml glass jars, each with a 10 cm by 10 cm, 12 ply, sterilized gauze pad
- Sealed jars with lids lined with solvent-cleaned aluminum foil or teflon

3) Prepare disposable templates such that the inner edges present a minimum of 100 cm^2 surface area.

   i. Template may be of any shape appropriate for the surface being tested (e.g., square or triangular) but shall be at least 100 cm2.

   ii. Smaller surface areas may be sampled if circumstances dictate; however, such an approach presents a risk of not detecting PCBs due to the small sample size and the limitations of the analytical equipment.

   iii. Templates are normally made of heavy paper or cardboard.

4) Mark with a piece of chalk a 100 cm^2 area on the surface to be tested and dispose of the template and gloves. Alternatively, the template may be taped to the surface.

5) Open one sample jar and remove the gauze pad from the jar, wearing a clean pair of latex gloves and using tweezers. Add 4 to 5 ml of hexane to the gauze pad from a pump burette on the solvent bottle.

6) Starting in one corner, using a uniform and steady pressure, wipe the premarked area with the gauze pad in rows, ensuring the entire area is covered.

7) Open the gauze pad and refold to expose fresh surfaces.

8) Using a uniform and steady pressure, wipe the marked area in rows, which are perpendicular to the previous rows (Step (6)). Ensure the entire area is swabbed equally.

9) Using tweezers, place the gauze pad back into the jar.

10) Close lid and label sample with reference coordinates and site name.

11) Dispose of gloves as PCB waste.

12) For each set of samples sent for analysis at the same time, submit a control sample in a separate jar by dampening one gauze blank with the solvent blank (hexane).

13) In the case of composite samples, the gauze pads that comprise the composite shall be placed (after wiping the appropriate areas), in the same sampling jar, which is then labeled as a composite sample.

    i. For example, if four areas are to be composited, gauze pads from four prepared sampling jars shall be used, one for each area.

    ii. Rather than returning each gauze pad to the jar it originated from, all gauze pads shall be placed into one jar after the wipes are performed.

NOTE: A composite sample is considered to be 4 to 6 areas

14) To sample wires or pipe, a length representing a 100 cm^2 area is marked and wiped by drawing the wire or pipe back and forth a total of eight times through a gauze pad which completely surrounds the wire. The gauze pad is opened to expose a fresh surface and the wiping is repeated until the entire marked length of wire or pipe is sampled.

15) Analysis should normally be performed using capillary Gas Chromatography– Electron Capture Detector (GC-ECD) using Aroclor standards for quantification. Alternative analytical methods include Gas Chromatography – Electro Conductivity Detection (GC-ELCD) or Gas Chromatography – Mass Spectrometry (GC-MS). General information on analytical methods and the sampling requirements in general may be obtained from Kinectrics Analytical Lab.

16) Repeat decontamination and sampling process for non-porous surfaces for those sample areas with results greater than accepted standards (greater than the 10 µg/100 cm^2).

d) The following guidance should be applied to non-porous surfaces which are known or suspected to be PCB-contaminated from spills or leaks:

    a. Thoroughly clean prior to sampling using the following solvents:

        i. For areas with low-level PCB contamination, use No. 2 fuel oil or Varsol®

        ii. For areas with high-level (> 10,000 ppm) PCB contamination, use Varsol® or hexane

- Clean contaminated areas in non-porous storage structures, using paper towels or rags, working from the outside to the inside of the stained area with up to 10 washes.
- Contaminated areas on large non-porous floor surfaces may be cleaned with a mop saturated with the appropriate solvent working from the outside to the inside of the stained area with up to 10 washes.

Contact local safety and health support groups to determine appropriate personal protective equipment and appropriate work practices and procedures when using solvents

D.2.0 SAMPLING POROUS SURFACES AND POLYCHLORINATED BIPHENYL – CONTAMINATED NON- STANDARD MATERIALS

Porous surfaces contaminated with *PCBs* (e.g., unsealed concrete, wood) shall require removal of the surface and analysis of the removed material.

a) Sampling frequency and location shall be similar to those for non-porous surfaces.

b) *PCB* concentrations at less than or equal to 2 ppm by weight shall be verified for those materials intended for non-*PCB* waste storage or disposal. If these concentrations cannot be achieved the porous surfaces shall be removed and disposed of as *PCB* waste.

Advice on *decontamination* and sampling of porous surfaces and *PCB*-contaminated non-standard materials or equipment may be obtained from the Senior Manager, Environment, Health & Safety (for Nuclear or RG respectively), and Senior Manager Environment, Health & Safety Corporate Programs (for Real Estate-managed facilities).

D.3.0 SOIL SAMPLING

a) Near-surface soil samples shall be collected from potentially contaminated areas and analyzed for the presence of *PCBs*.

b) If contamination is detected at levels exceeding the applicable site condition standard in the MECP document titled “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*” dated April 15, 2011, a more comprehensive series of soil, and possibly ground water samples, shall be collected and analyzed to determine the full extent of contamination. The site Environmental Advisor should be contacted to help determine the applicable site condition standard (i.e. Table) for the study area.

c) Contact the Senior Manager, Environment, Health & Safety Support – for Nuclear or RG respectively) and Senior Manager Environment, Health & Safety Corporate Programs (for Real Estate-managed facilities) to address further sampling and remediation requirements.

d) Near-surface soil samples shall be collected following the MECP Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario – December 1996. A proposed sampling protocol is included in this MECP document.

Table D1 Ministry of the Environment Soil Remediation Criteria for Polychlorinated Biphenyls (µq/q)

Compound	Surface Soil (<1.5m) [Where Soil pH is 5.0 to 9.0]				Subsurface Oil (>1.5m) [Where Soil pH is 5.0 to 11.0]				Ontario Soil - Background	
	Agricultural		Residential/ Park Land		Industrial/ Commercial		Residential/ Park Land		Industrial/ Commercial	
	Potable Water	Non-potable Water	Potable Water	Non-potable Water	Potable Water	Non-potable Water	Potable Water	Non-potable Water	Residential	Industrial
PCB	0.5	5	5	25	25	25	25	N/V*	N/V*	0.3	0.3

*no value

Note: [1]For information purposes, this table outlines the MECP soil remediation criteria for PCBs according to Appendix 2 of the MOE Guideline for Use at Contaminated Sites in Ontario (February 1997).

e) Soil samples shall be obtained from the following areas:

- Immediately outside the doors of the *storage structure* or *building*
- In any staging areas

- Under a *storage structure* if there is any contamination suspected or noted
- In the area of any surface staining

f) Required soil sampling equipment is as follows:

- Map of site; Shovel and hand auger (post hole digger type); Hand trowel; Tape measure; Heavy gauge plastic bags for soil storage; pH strips for determining soil pH; Permanent marker for sample identification of soil samples; Cooler and cooler packs or dry ice for sample storage during collection and transport

g) Using pH strips, take a reading of soil pH at the site. Soil pH shall be known when comparing soil contaminant levels to MECP Guideline. (Using pH strips to determine a general pH is sufficient and considerably cheaper than having soil samples analyzed to determine soil pH).

h) Soil sampling shall focus on near-surface (grab samples down to about 1.5 metres in depth) as follows:

- Three to five samples of 250 ml to 500 ml each shall be taken.
- Samples shall be placed in a plastic bag with the sample identification marked clearly on the bag (sample location or hole number, depth) with a permanent marker.

i) Once collected, the sample shall be sealed. If the bags are not zip-lock style, twist the opening of the bagged sample shut, double-fold the twisted portion and tape closed. If zip-lock bags are being used, double bagging would be prudent.

j) Bagged samples shall be kept cool by storing in a cooler with cooler packs or dry ice for transport to an analytical lab. If the samples are kept out of direct sunlight and are kept cool, the samples may be stored for a couple of months.

Once analytical results are received, *PCB* levels shall be compared to the values in Table D1 to determine if they exceed or fall below the MECP Guideline. If the levels exceed the MECP Guideline, Senior Manager, Environment, Health & Safety Support – (for Nuclear or RG as appropriate) and Senior Manager Environment, Health & Safety Corporate Programs (for Real Estate-managed facilities) shall address remediation requirements.

Note: Under O. Reg 406/19, there are digital reporting requirements to MECP.

Appendix E:
Nuclear Requirements for Refrigerant-containing Equipment

Facility Environment has reviewed the jurisdictional classification of the refrigerant-containing equipment and has developed the following 'rules' to ensure compliance with the appropriate regulations, unless identified in a Refrigerant Equipment Jurisdiction Exception List as described in section below:

a) The Federal Halocarbon Regulations SOR/2022-110, shall apply to ALL refrigerant-containing systems within the protected area of Darlington NGS and Pickering NGS (including security buildings), and within the licensed area of the nuclear waste management facilities at Darlington, Pickering and the Western Waste Management Facility.

b) The Provincial O. Reg. 463/10 Ozone Depleting Substances and Other Halocarbons, shall apply to ALL ODS containing systems outside the protected or licensed area of these facilities.

Facility Environment section may create a controlled Refrigeration Equipment Jurisdiction Exception List (the "List") for specific equipment exceptions to in order to ensure compliance with the applicable law, for example equipment which is part of the federal undertaking but located outside of the protected area. The list shall clearly state the location, the area serviced by the equipment and justification for the exception. It is intended that exceptions should be kept to a minimum and be based on conservative decision making. Consult with Director, Environment, Health & Safety- Nuclear if there are any questions.

In developing any exception, Facility Environment shall, in consultation with Director, Environment, Health & Safety - Nuclear, determine if the equipment is part of the federal undertaking as defined above. Director, Environment, Health & Safety- Nuclear shall concur with the List. The Director, Facility Operations and Maintenance shall approve the List and any changes to the List.

These requirements shall apply to all refrigerant containing systems, whether federally or provincially regulated.

Appendix F:
List of Halocarbons Prohibited for Use

1) Tetrachloromethane (Carbon Tetrachlorine)

2) 1,1,1-Trichloroethane (Methyl Chloroform), not including 1,1,2-Trichloroethane

3) Chlorofluorocarbons (CFC)

4) Bromochlorodifluoromethane (Halon 1211)

5) Bromotrifluoromethane (Halon 1301)

6) Dibromotetrafluoroethane (Halon 2402)

7) Bromochlorocarbons other than those set out in items 4 to 6

8) Bromochloromethane (Halon 1011)

9) Hydrobromofluorocarbons (HBFC)

10) Any isomer of any substance listed in items 1 through 9

11) Any mixture that contains any of the substances listed items 1 through 10;

Appendix G:
Site-Specific Nuclear Waste Management

G.1.0 DARLINGTON NUCLEAR WASTE MANAGEMENT PROGRAM

G.1.1 Radioactive Solid Waste

(a) Collection of radioactive solid waste from Zone 2 and Zone 3 areas shall comply with NK38-SMP-79600-03, Collection of Zone 2 and Zone 3 Waste.

(b) Segregation of radioactive solid waste from Zone 2 and Zone 3 areas shall be processed as outlined in NK38-SMP-79600-02, Segregation and Sorting of Wastes.

(c) Type 2 and Type 3 waste destined to be shipped to the WWMF shall be processed as outlined in NK38-SMP-79600-06, Solid Active Waste Handling and Shipping.

(d) Solid waste from the Tritium Removal Facility (TRF) and the Heavy Water Management Building (HWMB) shall be collected as outlined in NK38-SMP-79600-04, Collection of Solid Active Waste – Type 1 TRF – HWMB.

(e) Additional guidance for waste generators is provided in D-INS-79000-10002, Waste Disposal Guidelines for Solid Wastes and Recyclables at Darlington.

G.1.2 Conventional Solid Waste

(a) Conventional Solid Waste destined for landfill or recycling shall be processed as outlined in NK38-SMP-79500-04, Processing of Inactive Landfill Waste and Recyclable Materials.

(b) Collection of Conventional Solid Waste from Zone 2 and Zone 3 areas shall comply with NK38-SMP-79600-03, Collection of Zone 2 and Zone 3 Waste.

(c) Segregation of Conventional Solid Waste from Zone 2 and Zone 3 areas shall be processed as outlined in NK38-SMP-79600-02, Segregation and Sorting of Wastes.

(d) Additional guidance for waste generators is provided in D-INS-79000-10002, Waste Disposal Guidelines for Solid Wastes and Recyclables at Darlington.

G.1.3 Radioactive Oil and Chemical Waste

(a) Radioactive oil shall be processed in accordance with NK38-SMP-79500-07 Processing of Radioactive Oil for Acceptance at the Western Waste Management Facility.

(b) The solidification of radioactive aqueous chemical waste shall be performed in accordance with NK38-SMP-79500-08 The Use of Solidification Agents for the Treatment of Radioactive Liquid Wastes.

(c) Additional guidance for waste generators is provided in D-INS-79000-10001 Waste Disposal Guidelines for Oil and Chemical Wastes at Darlington.

G.1.4 Radioactive Liquid Waste Containing D2O

Radioactive liquid waste which has been collected in the powerhouse and contains D2O shall be disposed of in accordance with D-PROC-RA-0083, Radioactive Liquid Waste Handling.

G.1.5 Conventional Oil and Chemical Waste

(a) Collection and processing of bulk Conventional Oil and Chemical Wastes shall comply with D-INS-79000-10001, Waste Disposal Guidelines for oil and Chemical Waste at Darlington.

(b) Collection and processing of small article and drummed Conventional Oil and Chemical Wastes shall comply with NK38-SMP-79500-03 Collection, Sampling and Shipping of Chemical Waste.

(c) MECP waste manifests shall be completed and processed for subject wastes in accordance with D-INS-79000-10000 Completion of Waste Manifests at Darlington Nuclear.

(d) Additional guidance for waste generators is provided in D-INS-79000-10001 Waste Disposal Guidelines for Oil and Chemical Wastes at Darlington.

G.1.6 Construction Excavation Waste

Construction Excavation Waste generated within the Darlington Nuclear Operating Island shall be processed in accordance with N-GUID-01983-10001 Excavation, Concrete Drilling and Anchoring Processes. Note that associated N-FORM-11155 Waste Disposal Plan does not apply at Darlington.

G.2.0 PICKERING NUCLEAR WASTE MANAGEMENT PROGRAM

G.2.1 Radioactive Solid Waste

(a) Segregation and Handling of Radioactive solid waste that is generated by station employees shall comply with P-PROC-WM-0006, Segregation and Handling of Low and Intermediate Level Radioactive Waste.

(b) Collection of radioactive solid waste from Zone 3 areas shall comply with P-AB-SMP- 79100.04, Routine Collection of Zone 3 Waste.

(c) Segregation of radioactive solid waste from Zone 3 areas by station waste handlers shall comply with P-AB-SMP-79100.09, Zone 3 Waste Segregation, Sorting and Shipping.

G.2.2 Conventional Solid Waste

Conventional Solid Waste and solid recyclable materials shall be collected and processed in accordance with P-PROC-WM-0002, Disposal of Conventional Solid Waste and Recycling.

G.2.3 Radioactive Liquid Waste

(a) Radioactive waste oils that contain D2O shall be processed as outlined in P-INS-79000-00006, Processing of Waste Oils – Operating Island.

(b) Radioactive waste chemicals shall be processed as outlined in P-INS-79000-00007, Management of Small Waste Chemicals and Drummed Waste – Operating Island.

(c) Chemical Lab Technician shall sample and analyze *Oil and Chemical Waste* for radioactivity (tritium content and beta-gamma activity) and report results on P-FORM-10123, P-FORM-10316, or P-FORM-10031, and in the Chemical Waste Barcode Tracking System.

G.2.4 Conventional Oil and Chemical Waste

MECP waste manifests shall be completed and processed for subject wastes in accordance with P-INS-79000-00010, Completion of Waste Manifests at Pickering Nuclear.

G.2.5 Polychlorinated Biphenyl Waste

PCB waste shall be collected and processed in accordance with P-PROC-WM-0004, Requirements for Operations Involving Polychlorinated Biphenyls.

G.2.6 Construction Excavation Waste

Construction excavation waste generated within the Pickering Nuclear *Operating Island* shall be processed in accordance with N-GUID-01983-10001, Excavation, Concrete Drilling, and Anchoring Processes and N-FORM-11155, Waste Disposal Plan.