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Guide for Reporting to the National Pollutant Release Inventory (NPRI) 2010

Canadian Environmental Protection Act, 1999 (CEPA 1999)



Canada

Guide for Reporting

to the National Pollutant Release Inventory (NPRI)

2010

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Contact Information

For more information on the National Pollutant Release Inventory (NPRI), including guidance materials, annual summary reports, and access to NPRI data, consult the NPRI website at www.ec.gc.ca/inrp-npri. Questions and requests for assistance can be directed to Environment Canada using the “Contact the NPRI” form on the NPRI website (www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=D212BD29-1), or through the following:

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Cat. no.: En81-1/2010E-PDF
ISBN 978-1-100-17966-7

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Cette publication est aussi disponible en français sous le titre de « Guide de déclaration à l'Inventaire national des rejets de polluants (INRP) – 2010 ».

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Acknowledgements

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Special thanks to: Anne-Marie Carter, Angie Giammario, Jason Hawirko, François Lavallée, Henry Quon, Jody Rosenberger and Nancy Tremblay

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1. Introduction

The National Pollutant Release Inventory (NPRI) is Canada's legislated, publicly accessible inventory of pollutant releases, disposals and recycling. Sections 46–53 of the *Canadian Environmental Protection Act, 1999* (CEPA 1999) contain information-gathering provisions that allow the Minister of the Environment to require reporting of information on substances. The provisions also require the Minister to establish and publish a national inventory of releases and transfers of pollutants. These provisions under CEPA 1999 form the primary legislative basis for the NPRI. The NPRI reporting requirements were published in the *Notice with respect to substances in the National Pollutant Release Inventory for 2010* in the *Canada Gazette*, Part I, on December 11, 2010.

NPRI information is a major starting point for identifying and monitoring sources of pollution in Canada, and in developing indicators for the quality of our air, land and water. The NPRI helps determine if regulatory or other action is necessary to ensure reductions, and if so, the form that action should take. The NPRI provides Canadians with annual information on industrial, institutional, commercial and other releases and transfers in their communities.

This guide is designed to assist facility owners and operators in understanding the NPRI reporting requirements, and in determining if they are required to report to the NPRI. It provides a general overview of the reporting requirements for all NPRI substances, and provides information on additional guidance materials that address specific sectors, activities and substances.

2. Reporting Deadline, Changes to Reporting Requirements and Changes to the Reporting System

2.1 Reporting Deadline

The deadline for reporting to the NPRI for the 2010 calendar year is **June 1, 2011**, 11:59 p.m. Eastern Daylight Time. Reporting is mandatory for facilities that meet the requirements of the NPRI Notice published in the *Canada Gazette*, Part I, on December 11, 2010.

2.2 Changes to the Reporting Requirements for 2010

As part of our efforts to continuously improve reporting and streamline requirements where appropriate (for example, by removing elements that may no longer be relevant), certain changes have been made to the NPRI reporting requirements for 2010. These changes are described below.

2.2.1 Bisphenol A

The listing for “p,p’-isopropylidenediphenol” (Chemical Abstracts Service Registry Number [CAS RN] 80-05-7) has been changed to “bisphenol A” (CAS RN 80-05-7), as it is more commonly known. Note that this is a name change only. The reporting requirements have not changed for this substance, which has been listed in the NPRI since the inception of the program.

2.2.2 Sulphur Hexafluoride

Sulphur hexafluoride (CAS RN 2551-62-4) has been removed from the list of NPRI substances (previously listed under Part 1, Group 1), since this substance is primarily a greenhouse gas and is already reported under Environment Canada’s Greenhouse Gas Emissions Reporting Program.

2.2.3 Standard Industrial Classification Codes

The requirement to report Canadian and United States Standard Industrial Classification (SIC) codes has been removed, since these codes have been replaced by the North American Industry Classification System (NAICS). Only the six-digit NAICS Canada code corresponding to the facility needs to be reported.

2.2.4 Conventional Oil and Gas Extraction Facilities

Provincial licence and identification numbers from facilities in the conventional oil and gas extraction sector (NAICS Canada Code 211113) are now required to be reported. Due to the large number of facilities and the high frequency of ownership changes among facilities in this sector, collecting these additional identification numbers is expected to improve Environment Canada’s ability to track these facilities.

2.2.5 Pollution Prevention Plans

Information related to updates of pollution prevention plans, and whether the plans address energy or water conservation, is now required to be reported. This will provide additional information for Environment Canada to use in its pollution prevention efforts.

2.2.6 Anticipated Releases, Disposals and Recycling

The requirement to report on anticipated quantities of releases, disposals and recycling for each of the three subsequent years has been removed, since Environment Canada's analysis has indicated that the data reported through these fields provide limited meaningful information, and in many cases can lead to misinterpretation. Companies that have reliable information on anticipated trends for releases, disposals and recycling can voluntarily report this information using comments fields in the reporting system.

2.3 Changes to the Reporting System

Reporting to the NPRI is done through the One Window to National Environmental Reporting System (OWNERS). Environment Canada is currently in the process of updating OWNERS. The improved version of OWNERS will have upgraded technology and functionality, and will allow for a more streamlined reporting process. The updated version of OWNERS will be available in advance of the 2010 reporting period, and will continue to be accessed at www.owners.gc.ca.

3. General Information and Reporting Requirements

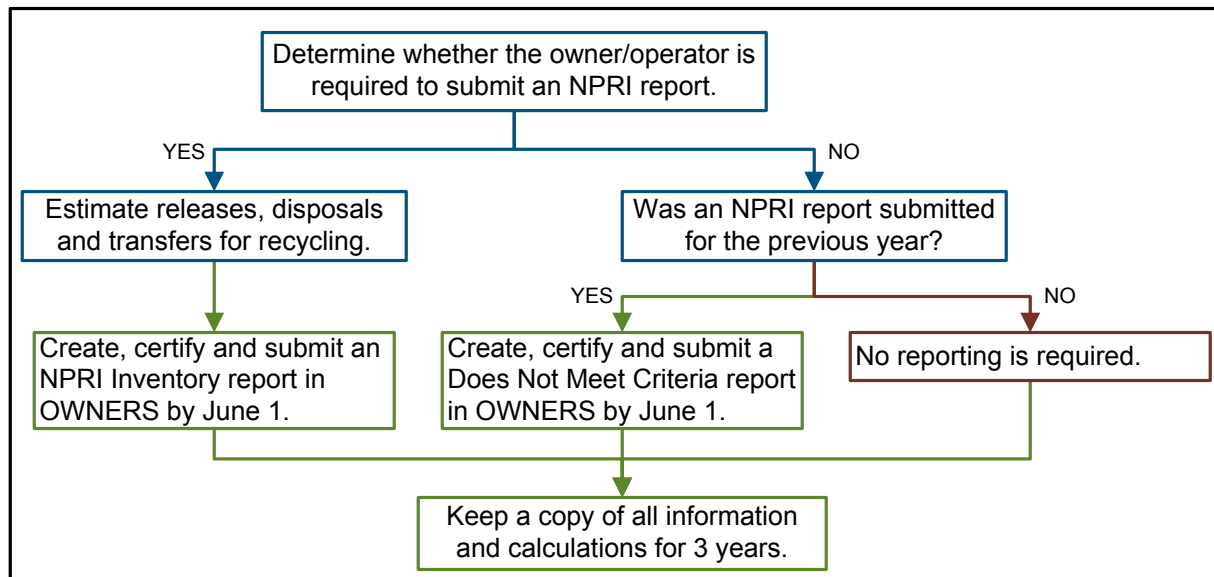
3.1 Introduction

This section summarizes the process for reporting to the NPRI, describes the legal basis for the NPRI, provides an overview of the NPRI reporting requirements, provides definitions of terms that are used throughout the Guide, and describes the information to be reported that applies to more than one group of substances. This section also provides information on additional resources that are available to assist in determining if a report is required for a facility, and on the methods for estimating quantities of releases, disposals and transfers for recycling. Details on reporting requirements and information to be reported that are specific to Parts 1 through 5 substances are presented in sections 4 through 9.

3.2 Process for Reporting to the National Pollutant Release Inventory

The NPRI reporting process is outlined in Figure 1. An NPRI report can be created and submitted to Environment Canada using the One Window to National Environmental Reporting System (OWNERS). OWNERS is an online reporting mechanism used by Environment Canada, other governments and private sector organizations to collect environmental data from industry. OWNERS is available at www.owners.gc.ca. Step-by-step instructions on the process of creating and submitting a report are available on the OWNERS website. In addition, help in OWNERS is available on every screen by following the “? Help” link.

Figure 1. Process for Reporting to the National Pollutant Release Inventory



3.3 The *Canada Gazette* Notice – The Legal Basis for the National Pollutant Release Inventory

The legal basis for the 2010 NPRI is the *Notice with respect to substances in the National Pollutant Release Inventory for 2010* published in the *Canada Gazette*, Part I, on December 11, 2010 (hereafter referred to as “the Notice”). The Notice is published under the authority of subsection 46(1) of CEPA 1999, and specifies that any person who owned or operated a facility during the 2010 calendar year, under the conditions prescribed in the Notice, must provide certain information to the Minister of the Environment by June 1, 2011.

Companies that meet reporting requirements but fail to report, fail to report on time, or knowingly submit false or misleading information, face penalties as listed under sections 272 and 273 of CEPA 1999. Facilities that did not meet the reporting criteria or were exempt from reporting in previous years should review their status to determine whether they are required to report for the current reporting year.

The Notice encompasses a wide range of substances and groups of substances, reporting criteria and requirements. It is divided into four schedules with several parts in each, as described in Table 1. For the complete list of NPRI substances, consult the NPRI website at www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=6A1C06B9-1.

Table 1. Overview of the National Pollutant Release Inventory *Canada Gazette* Notice

Schedule	Part	Contents
1 – List of Substances	1	Lists 231 substances and groups of substances and is divided into Groups 1 through 4, based on thresholds and information to be reported
	2	Lists 29 individual polycyclic aromatic hydrocarbons (PAHs)
	3	Lists 7 dioxins, 10 furans and hexachlorobenzene (HCB)
	4	Lists 7 criteria air contaminants (CACs)
	5	Lists 75 selected volatile organic compounds (VOCs) and groups of VOCs with additional reporting requirements (speciated VOCs)
2 – Definitions	n/a	Provides definitions of the terms used in the Notice
3 – Reporting Criteria	General	General reporting criteria, including the reporting deadline, the employee threshold, and exclusions and exemptions
	1	Criteria for substances listed in Schedule 1, Part 1
	2	Criteria for the PAHs listed in Schedule 1, Part 2
	3	Criteria for dioxins, furans and HCB listed in Schedule 1, Part 3
	4	Criteria for CACs listed in Schedule 1, Part 4
4 – Information to be Reported	General	General information required to be reported and manner of reporting
	Facility Information	Information to be reported on the facility, including name, identification codes, contacts and activities
	1	Information to be reported for substances listed in Schedule 1, Part 1
	2	Information to be reported for PAHs listed in Schedule 1, Part 2
	3	Information to be reported for dioxins, furans and HCB listed in Schedule 1, Part 3
	4	Information to be reported for CACs listed in Schedule 1, Part 4
	5	Information to be reported for speciated VOCs listed in Schedule 1, Part 5

For the purpose of simplifying this guide, the substances will be hereafter collectively referred to as follows:

- Schedule 1, Part 1, Group 1 substances as Part 1A substances;
- Schedule 1, Part 1, Group 2–4 substances as Part 1B substances;
- Schedule 1, Part 2 substances as Part 2 substances;
- Schedule 1, Part 3 substances as Part 3 substances;
- Schedule 1, Part 4 substances as Part 4 substances; and
- Schedule 1, Part 5 substances as Part 5 substances.

3.4 Overview of the National Pollutant Release Inventory Reporting Requirements

This section provides a brief overview of what facilities are required to report and the reporting thresholds, which are described in detail in Sections 4 through 9 of this Guide. In general, an NPRI report is required for any facility:

- where employees work a total of $\geq 20\,000$ hours (the employee threshold) (see section 3.6.1);
- where specified activities to which the employee threshold does not apply take place (see section 3.6.2);
- where the employee threshold is not met, but the reporting criteria for CACs are met; or
- that is a pipeline installation (defined in section 3.5.1)

and that meets any of the other reporting criteria (e.g., mass, concentration or activity thresholds).

The groups of substances have various thresholds (e.g., mass, concentration, activity, etc.) that are specified in Schedule 3 of the Notice. The thresholds are summarized in Table 2.

Table 2. Overview of National Pollutant Release Inventory Reporting Thresholds

Part	Substances	Mass Threshold	Thresholds
1A	<ul style="list-style-type: none"> 231 substances and groups of substances 	10 tonnes	<p>TOTAL quantity of a substance:</p> <ul style="list-style-type: none"> manufactured, processed or otherwise used at a concentration by weight of $\geq 1\%$, plus incidentally manufactured, processed or otherwise used as a by-product at any concentration, plus contained in tailings at any concentration, plus contained in waste rock at a concentration by weight of $\geq 1\%$
1B	<ul style="list-style-type: none"> Mercury 	5 kilograms	<p>TOTAL quantities of mercury at any concentration:</p> <ul style="list-style-type: none"> manufactured, processed or otherwise used, plus incidentally manufactured, processed or otherwise used as a by-product, plus contained in tailings, plus contained in waste rock
	<ul style="list-style-type: none"> Cadmium Arsenic Hexavalent chromium Lead Tetraethyl lead 	5 kilograms	<p>TOTAL of the quantity of a substance:</p> <ul style="list-style-type: none"> manufactured, processed or otherwise used at a concentration by weight of $\geq 0.1\%$, plus incidentally manufactured, processed or otherwise used as a by-product at any concentration, plus contained in tailings at any concentration, plus contained in waste rock at any concentration
2	<ul style="list-style-type: none"> 29 polycyclic aromatic hydrocarbons (PAHs) 	50 kilograms	<p>TOTAL of the quantities of PAHs at any concentration:</p> <ul style="list-style-type: none"> incidentally manufactured and released, disposed of or transferred for recycling, plus contained in tailings
		Any amount	Where wood preservation using creosote takes place, reporting is mandatory regardless of quantities or concentrations.
3	<ul style="list-style-type: none"> 7 dioxins 10 furans Hexachlorobenzene (HCB) 	Any amount	Where specified activities take place, reporting is mandatory regardless of quantities or concentrations.
4	<ul style="list-style-type: none"> Carbon monoxide Nitrogen oxides Sulphur dioxide Total particulate matter 	20 tonnes	Quantity released to air (no concentration threshold applies)
	<ul style="list-style-type: none"> Volatile organic compounds (VOCs) 	10 tonnes	
	<ul style="list-style-type: none"> Particulate matter ≤ 10 micrometres (PM₁₀) 	0.5 tonnes	
	<ul style="list-style-type: none"> Particulate matter ≤ 2.5 micrometres (PM_{2.5}) 	0.3 tonnes	
5	<ul style="list-style-type: none"> 75 speciated VOCs (individual VOCs, isomer groups and other groups and mixtures) 	1 tonne	Quantity released to air, provided that ≥ 10 tonnes of total VOCs are released to air (no concentration threshold applies)

3.5 Definitions

A comprehensive glossary of terms and expressions used by the NPRI is available on the NPRI website at www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=9264E929-1. The following sections provide definitions for some of the most common terms and expressions.

3.5.1 Facilities

The term “facility” refers to a contiguous facility, a portable facility, a pipeline installation or an offshore installation, as defined below.

Contiguous facility

A contiguous facility is defined as all buildings, equipment, structures and stationary items that are located on a single site, or on contiguous sites or adjacent sites, that are owned or operated by the same person and that function as a single integrated site, including wastewater collection systems that release treated or untreated wastewater into surface waters.

Portable facility

A portable facility is defined as portable polychlorinated biphenyl (PCB) destruction equipment, portable asphalt plants and portable concrete batching plants. The definition applies where the facility can be entirely relocated for operation.

Pipeline installation

A pipeline installation is defined as a collection of equipment, situated at a single site, used in the operation of a natural gas transmission or distribution pipeline. This definition includes pipeline compressor and storage stations along pipelines used to transport both raw and processed natural gas. Pipeline installations are subject only to the reporting criteria for CACs (Part 4 substances) and speciated VOCs (Part 5 substances).

Offshore installation

An offshore installation is defined as an offshore drilling unit, production platform or ship, or subsea installation that is related to the exploitation of oil or natural gas and that is attached or anchored to the continental shelf of Canada or within Canada’s exclusive economic zone.

3.5.2 Reporting Thresholds

Manufacture

The term “manufacture” means to produce, prepare or compound an NPRI substance. It also includes the incidental production of an NPRI substance as a by-product.

Examples of manufacture

The production of chlorine dioxide by a chemical plant is an example of manufacturing. The production of hydrochloric acid during the manufacture of chlorofluorocarbons is an example of the incidental manufacture of hydrochloric acid.

Process

The term “process” means the preparation of an NPRI substance, after its manufacture, for distribution in commerce. Processing includes the preparation of a substance with or without changes in physical state or chemical form. The term also applies to the processing of a mixture or formulation that contains an NPRI substance as one component, the processing of articles (see below for the definition of article), and the processing of a substance as a by-product.

Examples of process

The use of chlorine to manufacture hypochloric acid (not an NPRI substance) is an example of processing of chlorine. The use of toluene and xylene to blend paint solvent mixtures is an example of processing without changes in chemical form.

Other use or otherwise used

The terms “other use” and “otherwise used” mean any use, disposal or release of an NPRI substance that does not fall under the definitions of manufacture or process. This includes the use of the substance as a chemical processing aid, manufacturing aid or some other ancillary use, and the other use of by-products. Certain uses of substances are excluded. These are listed in Table 4 below.

Example of other use

The use of trichloroethylene in the maintenance of manufacturing and process equipment is considered an other use of that substance.

By-product

The term “by-product” refers to an NPRI substance that is incidentally manufactured, processed or otherwise used at the facility at any concentration, and released to the environment or disposed of. Substances are only considered by-products if they are released to the environment or disposed of. Substances that are recycled or that remain in the final product are excluded from the by-product definition.

Examples of by-products

Hydrogen fluoride is incidentally manufactured and released during aluminum smelting. The weight of the hydrogen fluoride by-product must be used in the calculation of the reporting threshold, regardless of concentration.

Manganese and nickel are incidentally present in coal. During combustion, a portion of these metals is concentrated in the ash, which is disposed of, and a portion of the metals is released in stack emissions. The weight of the metal released from the stack and in the ash sent for disposal must be included in the calculation of the reporting threshold.

Article

An “article” is defined as a manufactured item that does not release an NPRI substance when it undergoes processing or other use. When articles are processed or otherwise used, and there are no releases, or the releases are recycled with due care, the NPRI substances in that article do not need to be included in the threshold calculation.

Exercising due care means that the facility generated less than one kilogram of a Part 1A substance as waste during the year. There is no quantitative measure of due care in recycling Part 1B substances, because even minimal releases of these substances can cause significant adverse effects and can reasonably be expected to contribute to exceeding their low thresholds. Therefore, if an article containing a Part 1B substance is processed or otherwise used and there are releases, the Part 1B substance in the article must be included in the threshold calculation.

Examples of articles

In an instance where a metal reclamation facility accepts spent lead-acid batteries for recycling, and the batteries are broken into pieces in a hammer mill and their parts (sulphuric acid, lead and plastic) are subsequently reclaimed, the batteries lose their article status, because they are broken apart during the recycling process. The metal reclamation facility is now required to report any NPRI substances from these batteries if the thresholds are met.

A sealed glass bulb containing mercury used in a leveling switch meets the definition of an article. However, the quantity of mercury in the switch must be included in a facility’s calculation of the reporting threshold if the item loses its article status (e.g., the bulb is broken during waste management operations, thus allowing a release of mercury). As long as the bulbs remain intact, they are considered articles and are therefore not included in calculating the reporting threshold.

Tailings

The term “tailings” is defined as the waste material, which may or may not be mixed with water, that remains after processing of ore or mined materials, in order to extract marketable components such as metals, minerals or bitumen. This can include ground rock material, sand, clay, process chemicals or residual metals, minerals or bitumen, petroleum coke (petcoke) and sulphur.

Waste rock

“Waste rock” is rock that is removed in the mining process to provide access to the ore, and is not further processed during the reporting year. Waste rock does not include unconsolidated overburden, which is defined as unconsolidated materials overlying the ore (or bitumen) deposit, including but not limited to soil, glacial deposits, sand and sediment.

3.5.3 Releases, Disposals and Transfers

On-site releases

An on-site release is a discharge of a substance to the environment within the physical boundaries of the facility. This includes:

- emissions to air: discharges through a stack, vent or other point of release, losses from storage and handling of materials, fugitive emissions (releases that cannot be captured and releases that are unintentional), spills and accidental releases, and other non-point releases;
- releases to surface waters: direct discharges, spills and leaks, but not including discharges to municipal wastewater treatment plants (which are reported under off-site transfers for treatment); and
- releases to land: spills, leaks and other releases.

On-site disposals

On-site disposals include the following:

- total quantities of substances sent for final disposal to landfill, land application or underground injection on the facility site; and
- net quantities of substances that are moved into an on-site area where tailings or waste rock are discarded or stored and further managed to reduce or prevent releases.

Off-site disposals

Off-site disposals include total quantities that are transferred off the facility site to:

- landfill, land application or underground injection;
- storage prior to final disposal;
- treatment prior to final disposal (see below); and
- an area where tailings or waste rock are discarded or stored and further managed to reduce or prevent releases.

Off-site transfers for treatment prior to final disposal

A substance may be transferred to a location off the facility site for treatment prior to final disposal.

Treatment processes include:

- physical treatment (e.g., drying, evaporation, encapsulation or vitrification);
- chemical treatment (e.g., precipitation, stabilization or neutralization);
- biological treatment (e.g., bio-oxidation);
- incineration or thermal treatment, where energy is not recovered; and
- treatment at a municipal sewage treatment plant.

Off-site transfers for recycling and energy recovery

A substance may be transferred to a location off the facility site for recycling and energy recovery.

Recycling refers to activities that keep a material or a component of the material from becoming a waste destined for final disposal. Ten types of recycling operations are identified:

- energy recovery
- recovery of solvents
- recovery of organic substances (not solvents)
- recovery of metals and metal compounds
- recovery of inorganic materials (not metals)
- recovery of acids or bases
- recovery of catalysts
- recovery of pollution abatement residues

- refining or reuse of used oil
- other recovery, reuse or recycling activities

3.6 Facilities to Which the *Canada Gazette* Notice Applies

The NPRI reporting requirements apply to a facility:

- where the employee threshold is met (see section 3.6.1);
- where activities to which the employee threshold does not apply take place (see section 3.6.2);
- where the employee threshold is not met, but the reporting criteria for Part 4 substances are met; or
- that is a pipeline installation (defined in section 3.5.1)

and that meets any of the other reporting criteria (e.g., mass and concentration thresholds).

3.6.1 Employee Threshold

Facilities where the employees work a total of 20 000 hours or more during the calendar year (the employee threshold) are required to report to the NPRI, if the thresholds for at least one substance are met, or if an activity-based threshold is met. The employee threshold depends on the number of hours worked by all employees at the facility during the calendar year. This includes:

- all hours worked by individuals employed at the facility, including students, part-time and term employees;
- all hours worked by the owner(s) who performed work on-site at the facility;
- all hours worked by a person, such as a contractor, who performed work at the facility that is related to the operations of the facility; and
- all paid vacation and sick leave.

The employee threshold must be met by most facilities before they need to consider reporting for Parts 1 through 3 substances, unless activities to which the employee threshold does not apply (see section 3.6.2) take place at the facility.

3.6.2 Activities to Which the Employee Threshold Does Not Apply

If one or more of the activities listed in Table 3 take place at the facility, the owner/operator of the facility must report to the NPRI, regardless of the number of hours worked by employees (provided that other reporting criteria, such as mass and concentration thresholds [see Table 2], are also met). The employee threshold does not apply to these activities because they release significant quantities of NPRI substances to the environment, while not necessarily meeting the employee threshold. Descriptions of these activities are provided below.

In addition to the activities listed in Table 3, the employee threshold does not apply to facilities where stationary combustion equipment is operated, for the purposes of reporting Part 4 and 5 substances. Facilities that operate stationary combustion equipment must report for Parts 4 and 5 substances regardless of employee hours, provided the release thresholds are met.

Table 3. Activities to Which the Employee Threshold Does Not Apply

Activity
Non-hazardous solid waste incineration of ≥ 26 tonnes of waste, including, but not limited to, conical burners and beehive burners
Biomedical or hospital waste incineration of ≥ 26 tonnes of waste
Hazardous waste incineration
Sewage sludge incineration
Wood preservation (using heat or pressure treatment, or both)
Terminal operations
Discharge of treated or untreated wastewater from a wastewater collection system discharging an average of $\geq 10\,000$ m ³ /day into surface waters
Operations at pits or quarries where production is $\geq 500\,000$ tonnes

Incineration

A waste incinerator is a device, mechanism or structure constructed primarily to thermally treat (e.g., combust or pyrolyze) waste for the purpose of reducing its volume, or destroying hazardous chemicals or pathogens present in the waste. This includes facilities where waste heat is recovered as a by-product from the exhaust gases of an incinerator (e.g., energy-from-waste incinerators), conical burners and beehive burners. This does not include industrial processes where fuel derived from waste is fired as an energy source, such as industrial boilers. For example, if bark, wood chips or other wood waste is used as fuel to fire a boiler, these activities are not considered energy-from-waste incinerators.

Non-hazardous solid waste incineration

Non-hazardous solid waste is any solid waste, regardless of origin, that, if not incinerated, might normally be disposed of in a non-secure manner (e.g., at a sanitary landfill site). It includes clean wood waste (i.e., waste from woodworking or forest product operations, including bark, where the wood waste has not been treated with preservative chemicals or decorative coatings), and residential and other municipal wastes.

Biomedical or hospital waste incineration

Biomedical or hospital waste is waste that is generated by:

- human or animal health-care facilities;
- medical or veterinary research and testing establishments;
- health-care teaching establishments;
- clinical testing or research laboratories; and
- facilities involved in the production or testing of vaccines.

Biomedical or hospital waste includes human anatomical waste, animal waste, microbiology laboratory waste, human blood and body fluid waste, and waste sharps. It does not include waste that is from animal husbandry, is household in origin, or is controlled in accordance with the *Health of Animals Act*. Household wastes or wastes that are generated in food production, general building maintenance and office administration activities of those facilities to which this definition applies are considered to be non-hazardous waste, not biomedical or hospital waste. For more information, consult www.ccme.ca/assets/pdf/pn_1060_e.pdf.

Hazardous waste incineration

Hazardous waste includes wastes that are potentially hazardous to human health and/or the environment because of their nature and quantity, and that require special handling techniques. They are defined by taking into account the hazard criteria established under the *Transportation of Dangerous Goods Regulations* (www.tc.gc.ca/eng/tdg/clear-tofc-211.htm) as well as wastes and materials specifically listed in the Schedules of the *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations* (www.ec.gc.ca/lcpe-cepa/eng/regulations/detailReg.cfm?intReg=84). This includes hazardous waste incinerated in a mobile incinerator temporarily located at a facility.

Sewage sludge incineration

Sludge is a semi-liquid mass removed from a liquid flow of wastes. Sewage sludge is sludge from a facility treating wastewater from a sewer system. The drying of sludge to reduce water content is part of the incineration stage.

Wood preservation

Wood preservation is the use of a preservative for the preservation of wood by means of heat or pressure treatment, or both, and includes the manufacture, blending or reformulation of wood preservatives for that purpose. For more information, consult the *Guidance for Wood Preservation Facilities Reporting to the NPRI*, available at www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=29B3E589-1.

Terminal operations

Terminal operations are either (i) the use of storage tanks and associated equipment at a site used to store or transfer crude oil, artificial crude or intermediates of fuel products into or out of a pipeline; or (ii) the operating activities of a primary distribution installation, normally equipped with floating roof tanks, that receives gasoline by pipeline, railcar, marine vessel or directly from a refinery. Terminal operations do not include bulk plants or service stations.

Wastewater collection systems

A wastewater facility is a wastewater collection system that discharges treated or untreated wastewater into surface waters. Therefore, a wastewater system includes both the collection components (a system of sewers and/or ditches that convey sanitary or combined sewage for a community) and treatment components (a plant or process location that accepts collection-system flows for the purposes of removing substances from the wastewater). For more information, consult the *NPRI Guidance Manual for the Wastewater Sector*, available at www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=86E3D932-1, and *Identification of Wastewater Treatment System Configuration and Process Characteristics*, available at www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=57FBBE31-1.

Pits and quarries

A pit is an excavation that is open to the air, and any associated infrastructure, that is operated for the purpose of extracting sand, clay, marl, earth, shale, gravel, unconsolidated rock or other unconsolidated materials, but not bitumen.

A quarry is an excavation that is open to the air, and any associated infrastructure, that is operated for the purpose of working, recovering or extracting limestone, sandstone, dolostone, marble, granite or other consolidated rock.

For more information on reporting for pits and quarries, consult *Pits and Quarries Guidance*, available at www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=A9C1EE34-1.

3.7 Exemptions and Exclusions

3.7.1 Facilities Exempt from All NPRI Reporting Requirements

Two types of facilities are exempt from reporting to the NPRI:

- facilities used exclusively for oil and gas exploration or the drilling of oil and gas wells; these are the only types of oil and gas facilities exempt from reporting to the NPRI; and
- pits and quarries where annual production is < 500 000 tonnes.

3.7.2 Exclusions for All Substances

The quantity of a substance contained in any item listed in Table 4 should not be included when calculating and reporting releases, disposals or transfers for recycling. In addition, vehicle emissions (not including unpaved road dust) should not be considered when calculating the thresholds. A vehicle is any mobile equipment that is capable of self-propulsion, including fleet vehicles and earth-moving equipment (e.g., loaders, dump trucks, forklifts, excavators and bulldozers).

Table 4. Items Not Considered when Reporting to the National Pollutant Release Inventory

Articles that are processed or otherwise used ⁽¹⁾
Materials used as structural components of the facility (buildings and other fixed structures), but not process equipment
Materials used in janitorial or facility grounds maintenance ⁽²⁾
Materials used for personal use by employees or other persons
Materials used for the purpose of maintaining motor vehicles operated by the facility
Intake water or intake air, such as water used for process cooling or air used either as compressed air or for combustion

(1) See section 3.5.2 for the definition of an article.

(2) This includes NPRI substances contained in fertilizers and pesticides used for grounds maintenance, and cleaning agents used for maintaining facility cleanliness. The maintenance of process equipment (e.g., cleaning manufacturing equipment with a solvent) is not excluded.

3.7.3 Activities Exempt from Reporting for Parts 1-3 Substances

The threshold calculation for a substance must exclude the quantity of a substance that is manufactured, processed or otherwise used in the activities listed in Table 5. In cases where a facility met the reporting criteria for a substance based on sources other than those listed in Table 5, the quantity of that specific substance from any exempt activities should also not be included when reporting releases, disposals or transfers for recycling to the NPRI.

A facility is exempt from reporting Parts 1 through 3 substances if the only source or use of that substance is from one or more of the activities listed in Table 5. Note, however, that these facilities are not exempt from reporting releases of Parts 4 and 5 substances from stationary combustion equipment.

Table 5. Activities Not Considered when Reporting Parts 1, 2 and 3 Substances

Education or training of students
Research or testing
Maintenance and repair of vehicles (automobiles, trucks, locomotives, ships or aircraft), except painting and stripping of vehicles or their components, or the rebuilding or remanufacturing of vehicle components ⁽¹⁾
Distribution, storage or retail sale of fuels, except as part of terminal operations ⁽²⁾
Wholesale or retail sale of articles or products that contain the substance
Retail sale of the substance
Growing, harvesting or management of renewable natural resources
The practice of dentistry

- (1) Substances used for activities involving routine, scheduled and preventative maintenance of vehicles are exempt (e.g., repair, cleaning, replacement of lubricants/fluids). However, substances used in the painting or stripping of vehicles or vehicle components are subject to reporting. There is no exemption for activities that involve the removal, breakdown and total reconstruction of vehicle components (e.g., engines, landing gear, traction motors) using recovered or new parts, such that the rebuilt component is reinstalled or sold as an as-new replacement.
- (2) See section 3.5.2 for the definition of “terminal operations.” The exemption for distribution, storage or sale of fuels does not include terminal operations.

3.7.4 Exclusions for Tailings and Waste Rock

Tailings and waste rock are defined in section 3.4.2. The following sections describe the exclusions for stable/inert constituents of tailings, unconsolidated overburden and inert waste rock. These exclusions apply only to substances **contained in** tailings and waste rock. If a substance is **released to air or water from** tailings or waste rock (e.g., in airborne dust or as effluent), the quantity of the substance released must then be included in threshold calculations.

Stable/inert constituents of tailings

Substances contained in certain materials in tailings should be excluded from threshold calculations and reporting (e.g., sand grains from bitumen mines or in-situ production of bitumen). In order to be excluded, these materials must:

- be inert,
- be inorganic, and
- not have been crushed or otherwise physically or chemically altered.

The exclusion applies only to the components of tailings that meet the above three criteria (i.e., if part of the tailings stream met the criteria, only that portion of the tailings would be excluded, and the remainder of the tailings would be included).

Unconsolidated overburden

Substances contained in unconsolidated overburden should be excluded from threshold calculations and reporting. Unconsolidated overburden is unconsolidated materials overlying the ore or bitumen deposit, including, but not limited to, soil, glacial deposits, sand and sediment.

Inert waste rock

Substances contained in inert or clean waste rock should be excluded from threshold calculations and reporting. Inert waste rock is defined as waste rock that:

- is inert or clean according to a federal or provincial operating permit; or
- has a sulphur concentration of $\leq 0.2\%$; or
- has a sulphur concentration of $> 0.2\%$, and the ratio of neutralizing potential to acid-generating potential is $\geq 3:1$.

There is one exception to the exclusion for inert or clean waste rock: even if waste rock is inert or clean as defined above, the quantity of arsenic in waste rock cannot be excluded if the concentration of arsenic is > 12 milligrams per kilogram of waste rock.

3.8 Methods of Estimation

Estimates of the quantity of a substance that is manufactured, processed or otherwise used, and of the quantity that is released, disposed of or transferred for recycling, may be based on one of the following methods:

- Continuous emission monitoring systems
- Predictive emission monitoring
- Source testing
- Mass balance
- Site-specific emission factor
- Published emission factor
- Engineering estimates

A description of these methods is provided in the following sections. Examples using these estimation methods can be found in the *NPRI Toolbox* (www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=65A75CDF-1).

Information on releases, disposals and transfers for recycling needs to be reported if the owner/operator possesses the information or may reasonably be expected to have access to the information. The Notice specifies that if emissions are already monitored or measured under provincial or federal legislation or a municipal bylaw, those measurements must be used to report to the NPRI. If emissions are not monitored or measured under provincial or federal legislation or a municipal bylaw, reasonable efforts must still be undertaken to gather information on releases, disposals and transfers of a substance. What is “reasonable” depends on individual circumstances, but may include additional monitoring for NPRI substances.

In deciding whether additional efforts should be undertaken to generate new information for the purposes of NPRI reporting, the following factors, among others, should be considered:

- the health and environmental risks posed by a substance, including whether the substance has been declared toxic under CEPA 1999;
- the relative contribution of the industrial sector to releases, disposals and transfers for recycling of a substance in Canada;
- the relative contribution of the facility to releases, disposals and transfers for recycling of a substance in Canada; and
- the cost of additional monitoring.

Environment Canada is developing more detailed guidance that will outline suggested estimation methods, and will be recommending their use as they become available. For more information, consult the *NPRI Toolbox*.

3.8.1 Continuous Emission Monitoring Systems

Continuous emission monitoring systems (CEMS) record emissions over an extended and uninterrupted period. Once the concentration of a substance and the flow rate have been determined, emission rates can be calculated by multiplying the concentration by the discharge flow rate or volumetric stack gas flow rate. Annual emissions of the substance can then be estimated by multiplying the concentration by the annual flow rate of the discharged effluent or the gases in the stack or duct.

3.8.2 Predictive Emission Monitoring

Predictive emission monitoring (PEM) is based on developing a correlation between substance emission rates and process parameters (e.g., fuel usage, steam production, furnace temperature). PEM may be considered a hybrid of continuous monitoring, emission factors and stack tests. A correlation test must first be performed to determine the relationship between emission rates and process parameters. Emissions can then be calculated or predicted using process parameters to predict emission rates based on the results of the initial source test.

3.8.3 Source Testing

Source testing involves collecting a sample of the emission or effluent, then determining the concentration of one or more substances in the sample. The concentration of the substance(s) of interest is then multiplied by the volumetric flow rate to determine the amount of the substance(s) emitted over time. Source testing of air emissions generally involves inserting a sampling probe into the stack or duct to collect a volume of exhaust effluent isokinetically. The substances collected in or on various media are subsequently analyzed. For liquid effluents, grab samples or 24-hour composite samples are extracted from the effluent stream.

3.8.4 Mass Balance

Mass balance involves applying the law of conservation of mass to a facility, process or piece of equipment. If there is no accumulation, all the materials that go into the system must come out. Releases are determined from the differences in input, output, accumulation and depletion of a substance. The general equation for a mass balance is:

$$M_{in} = M_{out} + M_{accumulated/depleted}$$

Where:

M_{in} = Mass of compound in the raw material feed

M_{out} = Mass of compound in the finished product and released to air, land and water

$$(M_{out} = M_{product} + M_{emitted})$$

$M_{accumulated/depleted}$ = Mass of compound accumulated or depleted in the system

The reliability of release estimates based on mass balances is dependent on the source type considered. Mass balance methods may be preferred for some releases, such as solvent use and loss. However, this method may not be suitable for many other sources, such as cases where chemical transformation of input streams occurs.

3.8.5 Site-Specific and Published Emission Factors

Generally, emission factors relate the quantity of substances emitted from a source to a common activity associated with those emissions. Emission factors may be published or developed by facilities using emission testing data and source-activity information. For a particular piece of equipment, specific emission factors may be available from the manufacturer or sales centre. The basic equations for determining emissions from emission factors are as follows:

$$E_x = BQ \times CEF_x \text{ or}$$

$$E_x = BQ \times EF_x \times \frac{100 - CE_x}{100}$$

Where:

E_x = Emission of substance x (kg or other unit of mass)

BQ = Activity rate or base quantity (base quantity unit)

CEF_x = Controlled emission factors of substance x (kg/BQ [dependent on any control devices installed])

EF_x = Uncontrolled emission factors of substance x (kg/BQ)

CE_x = Overall emission control efficiency of substance x (%)

3.8.6 Engineering Estimates

In many cases, sound engineering assessment is the most appropriate approach to determining process factors and base quantity values. Releases can be estimated from engineering principles and judgement by using knowledge of the chemical and physical processes involved, the design features of the source, and an understanding of the applicable physical and chemical laws. The reliability of these estimates depends on the complexity of the process and the level of understanding of its physical and chemical properties. To apply an engineering assessment method, follow these four basic principles:

1. Review all data pertaining to the specific source and to the industrial sector in general.
2. Use this data to provide gross approximations—and refine the approximations using sound engineering principles as data become available, in order to provide more accurate estimations.
3. Whenever possible, use alternate methods of calculation to cross-check each level of approximation.
4. Employ good record keeping.

3.8.7 Method Detection Limit

In NPRI reporting, there are several situations in which the issue of measurements below the method detection limit (MDL) arises. The MDL is the smallest concentration of the substance under analysis (i.e., the analyte) that produces an instrumental response and that meets all analyte detection and identification criteria of a specified test method. An indication that a reportable substance is below the MDL is not equivalent to stating that the substance is not present. If it is known that the substance is present, a concentration equivalent to half of the MDL should be used.

In a year where multiple measurements of the concentration of a substance in a given process stream are all below the MDL, and there is no other reason to believe that the substance is present, it can be assumed that the concentration of the substance in that process stream is zero.

In a year where multiple measurements are taken, and some measurements indicate that the concentration is above the MDL and some indicate that it is below the MDL, there is reason to assume that the substance is present. Therefore, a value of half the MDL should be used for those measurements where the concentration is below the MDL.

3.9 Sources of Information

Information required to perform threshold calculations and to estimate releases, disposals and transfers for recycling of NPRI substances is available from a variety of sources, including Environment Canada, the U.S. Environmental Protection Agency (EPA) and industry associations. These resources are described in the following sections. Useful information can also be found in Material Safety Data Sheets, and in permits and certificates of approval.

3.9.1 Environment Canada Guidance Documents and Tools

NPRI Toolbox

The *NPRI Toolbox* (www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=65A75CDF-1) provides a number of tools:

- General Guidance
- General Information on Emission Factors and Emission Estimation Techniques
- Useful Equations and Conversion Factors
- Example Calculations
- Software
- Information on Fuel Combustion and Fugitive Emission Sources
- Sector-Specific Information
- Miscellaneous Resources and Other Relevant Links

The sections on fuel combustion and fugitive emission sources and the sector-specific pages of the *NPRI Toolbox* include links to calculation spreadsheets developed for specific activities and sectors. When information (such as production quantities or fuel used) is entered, these spreadsheets will automatically calculate releases of NPRI substances.

Guidance documents

In addition to this guide, Environment Canada has developed several substance-, activity- and sector-specific guidance documents to assist in reporting to the NPRI. Table 6 lists these documents and their Internet addresses.

Table 6. Environment Canada Guidance Documents

Type of Guidance	Title	Internet Address
Substances	<i>Criteria Air Contaminants (CACs) Technical Source Guide for Reporting to the National Pollutant Release Inventory</i>	www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=3B695DF5-1
	<i>Phosphorus Guidance</i>	www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=46C694F1-1
	<i>Supplementary Guide for Reporting Criteria Air Contaminants (CACs) to the National Pollutant Release Inventory</i>	www.ec.gc.ca/Publications/default.asp?lang=En&xm=4A2D4BB8-BFA0-4129-A5A3-DBA372BD3B32
	<i>Determining the Reporting Threshold for Total Reduced Sulphur Using Equivalence Factors</i>	www.ec.gc.ca/inrp-npri/default.asp?lang=en&n=AAECF4F6-1
Activities	<i>Guidance for the Reporting of Tailings and Waste Rock to the National Pollutant Release Inventory</i>	www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=C115DEB3-1
	<i>Guidance for the Reporting of Welding Activities</i>	www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=0FAE8C2F-1
	<i>Guidance on Estimating Road Dust Emissions from Industrial Unpaved Surfaces</i>	www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=5DF2CF83-1
	<i>Wet Cooling Tower Guidance</i>	www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=2ED8CFA7-1
Sectors	<i>Guidance for Wood Preservation Facilities Reporting to the NPRI</i>	www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=29B3E589-1
	<i>NPRI Guidance Manual for the Wastewater Sector</i>	www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=86E3D932-1
	<i>Identification of Wastewater Treatment System Configuration and Process Characteristics</i>	www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=57FBBE31-1
	<i>Pits and Quarries Guidance</i>	www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=A9C1EE34-1
	<i>National Pollutant Release Inventory Reporting Guidance on Biosolids</i>	www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=FC674F4F-1
	<i>Reporting Requirements for the Oil & Gas Sector</i>	www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=5B72775D-1

3.9.2 U.S. Environmental Protection Agency Guidance Documents and Tools

The U.S. EPA has published numerous documents and software programs that can be used to assist facilities; these are described in Table 7.

3.9.3 Industry Association Guidance

Table 8 lists the industry association guidance available through the *NPRI Toolbox*.

Table 7. U.S. Environmental Protection Agency Guidance Documents and Tools

Guidance Document/Tool	Description	Internet Address
AP 42, Fifth Edition – <i>Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources</i>	Primary compilation of the U.S. EPA’s emission factor information, containing emission factors and process information for more than 200 air pollution source categories	www.epa.gov/ttn/chief/ap42/index.html
Guidance Documents for reporting to the Toxics Release Inventory	Industry/process-specific and substance-specific guidance manuals to help estimate releases for reporting to the Toxics Release Inventory, which provide useful information for NPRI reporters	www.epa.gov/tri/guide_docs/index.htm
Locating and Estimating Documents	Compilations of available information on substances and sources of emissions	www.epa.gov/ttn/chief/le/index.html
Landfill Gas Emissions Model	Tool that can be used to estimate emission rates for non-methane organic compounds and individual air pollutants from municipal solid waste landfills	www.epa.gov/ttn/catc/products.html#software
PM Calculator	Contains information that allows the estimation of particulate matter fractions from total particulate matter	www.epa.gov/ttn/chief/tools/pm_calculator_condensibles.zip
SPECIATE	Repository of total organic compound and particulate matter speciation profiles for air pollution sources	www.epa.gov/ttn/chief/software/speciate/index.html
TANKS	Program that estimates volatile organic compound and hazardous air pollutant emissions from fixed- and floating-roof storage tanks	www.epa.gov/ttn/chief/software/tanks/index.html
WATER9	Program for estimating air emissions of individual waste constituents in wastewater collection, storage, treatment and disposal facilities	www.epa.gov/ttn/chief/software/water/water9_3/index.html
WebFIRE	The online Factor Information Retrieval (FIRE) database, which contains information on air emissions factors	http://cfpub.epa.gov/webfire/

Table 8. Industry Association Guidance Documents

Sector(s)	Association	Guidance
Mining; base metal smelting; iron ore pellets; potash mining	Mining Association of Canada	<ul style="list-style-type: none"> • <i>Reporting to the National Pollutant Release Inventory, An Interpretation Guide</i>
Chemicals manufacturing	Canadian Chemical Producers Association	<ul style="list-style-type: none"> • <i>NERM Reporting Guide</i> • <i>Guideline for Quantifying Emissions from Chemical Facilities</i> • <i>Source Characterization Guidelines – Primary Particulate Matter and Particulate Precursor Emission Estimation Methodologies for Chemical Production Facilities</i>
Upstream oil and gas; oil sands; natural gas transmission, distribution and storage	Canadian Association of Petroleum Producers	<ul style="list-style-type: none"> • <i>NPRI Guide – A Recommended Approach to Completing the National Pollutant Release Inventory for the Upstream Oil and Gas Industry</i> • <i>National Pollutant Release Inventory VOC Speciation Calculator</i> • <i>NPRI Guide – CAPP VOC Speciation Calculator</i>
Petroleum refining; petroleum product terminals	Canadian Petroleum Products Institute	<ul style="list-style-type: none"> • <i>Code of Practice for Developing an Emission Inventory for Refineries and Terminals, Revision 12</i>
Wastewater	Canadian Water and Wastewater Association	<ul style="list-style-type: none"> • <i>National Pollutant Release Inventory and Municipal Wastewater Services – Reporting Guidance For Small To Medium Wastewater Facilities</i>

3.10 General Information to be Reported

3.10.1 Contact Information

For each of the following, the name, position, mailing address, telephone number and email address must be provided:

- *Technical contact*: the person who prepared the report and who will be able to answer any questions pertaining to its contents. All correspondence from Environment Canada regarding the NPRI will be sent to the technical contact if no coordinator (see below) is identified.
- *Public contact* (if any): the person responsible for answering any questions from the public concerning the report. This name will appear on the NPRI website as the contact for the facility. If a public contact is not identified, the name of the coordinator, or technical contact if no coordinator is identified, will appear instead.
- *Coordinator* (if any): the person who is responsible for preparing and submitting NPRI reports for more than one facility for the same company. The coordinator is responsible for answering any questions concerning all of the NPRI reports he/she filed. All NPRI correspondence from Environment Canada will be sent to the coordinator, if one is identified.
- *Certifying official*: the person who is legally responsible for the contents of the NPRI report. The certifying official is usually the owner or operator, or a company official authorized to act on his/her behalf.
- *Independent contractor* (if any): if an independent contractor prepared the report, contact information must be provided, including the name of the contracting company.

It is important that contact and ownership information be kept up-to-date using the online reporting system or by contacting Environment Canada, if:

- there is a change in the name, address, telephone number or email address of the contacts identified for the facility; or
- there is a change in the owner or operator of a facility.

3.10.2 Facility Information

Table 9 summarizes the general information that must be provided for all facilities that report to the NPRI. Other facility information may also be required, depending on the type of facility and the substances reported.

Table 9. Facility Information Required to Be Reported to the National Pollutant Release Inventory

Type of Information	Information to Be Reported
Facility name and location	<ul style="list-style-type: none"> • name of the facility • address of the physical location of the facility (e.g., a civic address, a legal land description, or just a description if no other type of physical address is applicable [e.g., for an offshore installation]) • latitude and longitude coordinates of the facility if the facility is reporting for the first time or if the facility is portable
Employees	<ul style="list-style-type: none"> • number of full-time employees
Organization (company)	<ul style="list-style-type: none"> • legal and trade name of the facility's company • mailing address • Dun & Bradstreet (D-U-N-S) Number⁽¹⁾ • federal business number⁽²⁾
Parent companies (if any)	<ul style="list-style-type: none"> • legal names of any Canadian parent companies • civic addresses of the parent companies • D-U-N-S Numbers⁽¹⁾ of the parent companies • federal business numbers⁽²⁾ of the parent companies
NPRI identification number	<ul style="list-style-type: none"> • unique identifier provided by Environment Canada and used for reporting to the NPRI
North American Industry Classification System (NAICS) Code ⁽³⁾	<ul style="list-style-type: none"> • 6-digit NAICS Canada code of the facility
Pollution prevention plan	<ul style="list-style-type: none"> • whether and why a pollution prevention plan was prepared • whether an existing pollution prevention plan was updated • whether the plan addressed substances, energy conservation or water conservation

(1) A Dun & Bradstreet (D-U-N-S) number is a unique nine-digit identification number for a single business entity.

(2) A federal business number is a nine-digit registration number issued by the Canada Revenue Agency (CRA) to Canadian businesses that register for one or more of the following: corporate income tax; importer/exporter account number; payroll deductions; or goods and services tax. This number can be found on all forms issued to a business by the CRA. The first nine digits that appear on these forms is the federal business number.

(3) NAICS is an industry classification system developed by the statistical agencies of Canada, Mexico and the United States. For more information, see the Statistics Canada website: www.statcan.gc.ca/subjects-sujets/standard-norme/naics-scian/2007/introduction-eng.htm. For a list of 6-digit NAICS codes, see the *NPRI Toolbox* at www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=6DE7F8BC-1#n8.

3.11 Other Requirements

3.11.1 Statement of Certification

A Statement of Certification (SOC) must be electronically signed and submitted with the NPRI report in OWNERS. The certifying official should verify that the information submitted is true, complete and accurate, and acknowledge that the data will be made public. The certifying official is legally responsible for the contents of the NPRI report.

3.11.2 Record Keeping

Pursuant to subsection 46(8) of CEPA 1999, the owner/operator of a facility is required to retain copies of all information on which their report is based, including any calculations, measurements and other related data, for a period of three years. This information must be kept at the facility or at the principal place of business in Canada of the owner/operator of the facility to which the information relates, for a period of three years.

4. Reporting for Part 1A Substances – Core Substances

Part 1A lists 231 substances and groups of substances of concern, most of which have been listed on the NPRI since its inception. These substances are commonly referred to as the “core substances,” and comprise the majority of the NPRI substance list. For the complete list of NPRI substances, consult the NPRI website at www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=6A1C06B9-1.

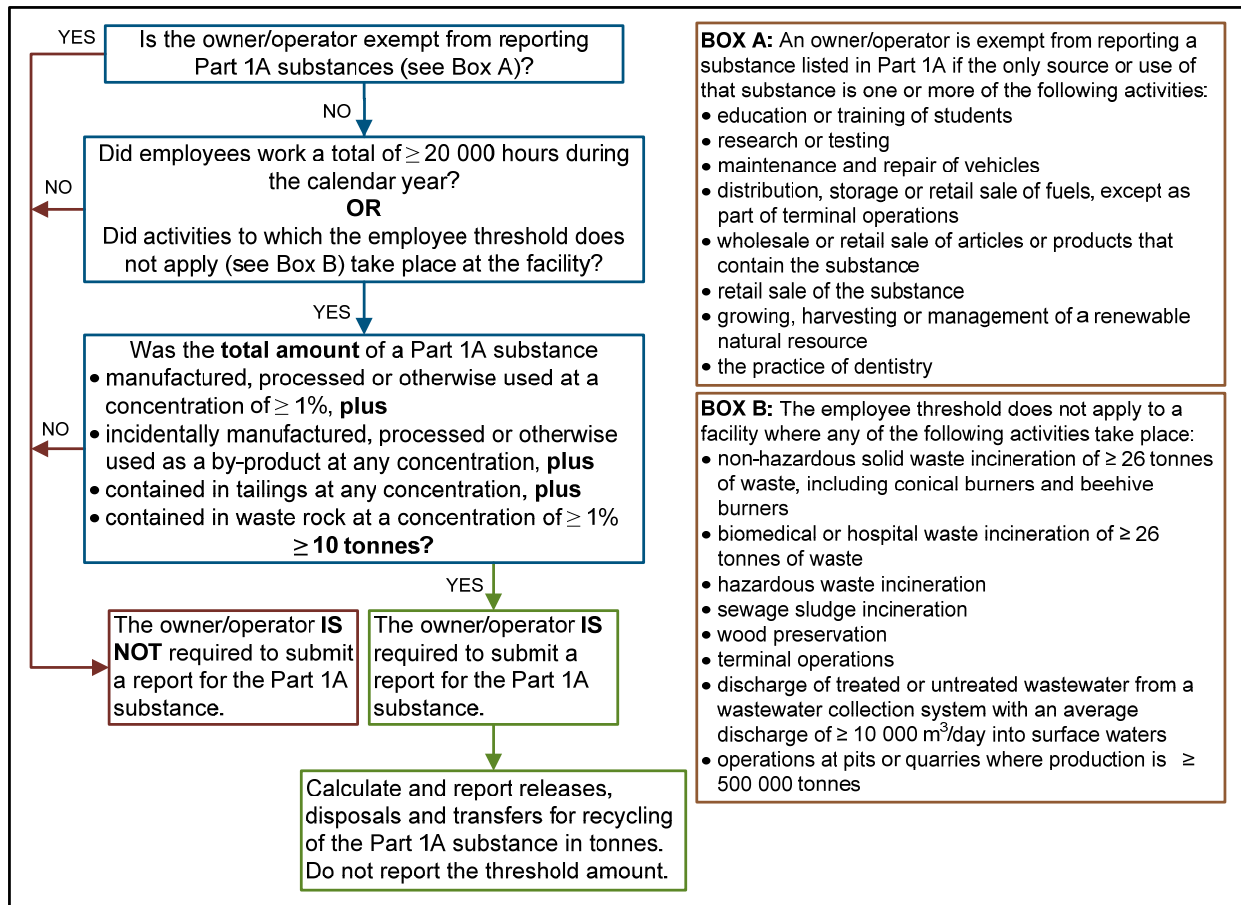
4.1 Reporting Criteria for Part 1A Substances

In general, any person who owns or operates a contiguous facility or offshore installation must submit an NPRI report for a Part 1A substance if both of the following criteria are met:

1. employees work a total of $\geq 20\,000$ hours, or activities to which the employee threshold does not apply (see Table 3) take place at the facility, and
2. the **total amount** of the Part 1A substance
 - manufactured, processed or otherwise used at a concentration (by weight) of 1% or more, **plus**
 - incidentally manufactured, processed or otherwise used as a by-product at any concentration, **plus**
 - contained in tailings at any concentration, **plus**
 - contained in waste rock that is not clean or inert (see section 3.7.4) at a concentration (by weight) of 1% or more**is ≥ 10 tonnes.**

Figure 2 illustrates the steps for determining if a report is required for Part 1A substances.

Figure 2. Reporting for Part 1A Substances



4.1.1 Part 1A Substance Qualifiers

Some Part 1A substances and groups of substances are qualified in terms of their specific physical or chemical form, state or particle size. The qualifiers, described in Table 10, determine whether a report will be required for a given substance.

Table 10. Qualifiers for Part 1A Substances

Substance Qualifier	Substance(s) to Which the Qualifier Applies	Description
all isomers	cresol (CAS RN 1319-77-3), HCFC-122 (41834-16-6), HCFC-123 (34077-87-7), HCFC-124 (63938-10-3), and xylene (1330-20-7)	Total of all isomers reported as an aggregate of the individual isomers
and its compounds	antimony, cobalt, copper, manganese, nickel, selenium and zinc	The pure metal and the equivalent weight of the metal in any compound, alloy or mixture must be reported as the equivalent weight of the metal itself.
	chromium	Pure chromium and chromium contained in any compound, alloy or mixture must be reported as the equivalent weight of chromium, excluding hexavalent chromium and its compounds.
	vanadium (7440-62-2)	Pure vanadium and vanadium in any compound or mixture must be reported as the equivalent weight of vanadium. Do not include vanadium contained in an alloy.
and its salts	acrylic acid (79-10-7), aniline (62-53-3), chloroacetic acid (79-11-8), cresol (1319-77-3), 2,4-diaminotoluene (95-80-7), 2,4-dichlorophenol (120-83-2), diethanolamine (111-42-2), N,N-dimethylaniline (121-69-7), 4,6-dinitro- <i>o</i> -cresol (534-52-1), hydrazine (302-01-2), hydroquinone (123-31-9), Michler's ketone (90-94-8), nitrilotriacetic acid (139-13-9), <i>p</i> -nitrophenol (100-02-7), peracetic acid (79-21-0), phenol (108-95-2), <i>p</i> -phenylenediamine (106-50-3), <i>o</i> -phenylphenol (90-43-7), pyridine (110-86-1), and quinoline (91-22-5)	Weak acids and bases are listed with this qualifier. Although the CAS RN that appears on the NPRI list is specific to the acid or base, all salts of these substances must be reported as an equivalent weight of the acid or base.
expressed as hydrogen sulphide	total reduced sulphur (TRS)	Total of hydrogen sulphide (7783-06-4), carbon disulphide (75-15-0), carbonyl sulphide (463-58-1), dimethyl sulphide (75-18-3), methyl mercaptan (74-93-1), and dimethyl disulphide (624-92-0), expressed as hydrogen sulphide
fibrous forms only	aluminum oxide (1344-28-1)	Fibrous refers to a synthetic form of aluminum oxide that is processed to produce strands or filaments. This includes the form of aluminum oxide found in brake linings, but excludes the more common granular, powdered or fumed forms of alumina.
friable form only	asbestos (1332-21-4)	Only asbestos that is brittle and readily crumbled (i.e., friable) should be reported.
fume or dust only	aluminum (7429-90-5)	Include dry forms of aluminum only, with particle diameters of 0.001-1 micrometre for fumes and 1-100 micrometres for dust.
in solution at a pH of 6.0 or more	nitrate ion	This distinguishes nitrate ion in neutral or basic solution from nitric acid (pH of less than 6.0). If nitric acid is neutralized to a pH of 6.0 or greater, report for both nitric acid (7697-37-2) and nitrate ion in solution.
ionic	cyanides	Includes the salts of hydrogen cyanide, but excludes organocyanides, nitriles and organometallic cyanide compounds.
mixed isomers	dinitrotoluene (25321-14-6) and toluenediisocyanate (26471-62-5)	Total of all isomers occurring in mixtures.
total	ammonia	Total of ammonia (NH ₃) (7664-41-7) and the ammonium ion (NH ₄ ⁺) (14798-03-9) in solution, expressed as ammonia
	phosphorus	Total of all phosphorus, not including yellow or white phosphorus (7723-14-0)
yellow or white only	phosphorus	Total of the yellow and white allotropes of elemental phosphorus only

4.2 Calculating the Reporting Threshold for Part 1A Substances

When calculating the 10-tonne reporting threshold, include the quantity of a Part 1A substance that is:

- manufactured at a concentration equal to or greater than 1% by weight;
- processed at a concentration equal to or greater than 1% by weight;
- otherwise used at a concentration equal to or greater than 1% by weight;
- a by-product, at any concentration, released on-site to the environment or disposed of on- or off-site;
- contained in tailings, at any concentration; and
- contained in waste rock at a concentration equal to or greater than 1% by weight.

Do not include quantities of a Part 1A substance contained in any of the sources that should not be considered, as listed in Table 4.

Any substances that are transferred off-site for recycling and returned to the facility should be treated as the equivalent of newly purchased material. Since a substance may undergo many processes in a facility, care should be taken not to double-count process streams when calculating the reporting threshold.

The total quantity of a Part 1A substance manufactured, processed or otherwise used at concentrations greater than or equal to 1%, at any time or in any part of the facility, must be included when calculating the 10-tonne reporting threshold. For example, the quantity of a substance received by a facility at 30% concentration and then diluted to less than 1% for use, is included in the threshold calculation. A substance received at the facility at less than 1% and subsequently concentrated to 5% would also be included in the threshold calculation.

Facilities that repackage or transfer Part 1A substances between containers need only consider the quantity of the substance repackaged or transferred.

If only a range of concentrations is available for a substance present in a mixture, contact the supplier of the substance for more detailed information. If no additional information is available, use the average of the range for threshold determinations.

4.2.1 Example of Calculating the Reporting Threshold for Part 1A Substances

Table 11 illustrates the calculation of the reporting threshold. In the example, a facility has several processes in which a Part 1A substance is manufactured, processed or otherwise used. The substance is also released as a by-product and is contained in tailings and waste rock.

This example assumes that the employee threshold is met, or an activity to which the employee threshold does not apply takes place at the facility. In this case, a report is required for this substance, because the total amount of the Part 1A substance manufactured, processed, otherwise used, and contained in tailings and waste rock at the facility exceeded 10 tonnes, as explained below.

Table 11. Example of a Threshold Calculation for Part 1A Substances

Material/Process Containing the Substance	Total Weight of Material Containing the Substance (Tonnes)	Concentration/Equivalent Weight of the Substance in Material/Process (Percent)	Net Weight of the Substance to Include in Threshold Calculation (Tonnes)
1. Compound material in process stream A	150	5	7.5
2. Raw material in process B	2	100	2.0
3. Raw material in process C	45	0.20	n/a
4. By-product released from process D	10 000	0.01	1.0
5. Tailings	24 000 000	0.00001	2.4
6. Waste rock	20 000 000	0.00002	n/a
7. TOTAL			12.9

1. In process A, the Part 1A substance is present at 5% concentration (or equivalent weight for metallic compounds) and is included in the threshold calculation.
2. In process B, the raw material added to the process is a pure substance. It is included in the threshold calculation, regardless of any subsequent dilution in the process.
3. The weight of the substance in the raw material used in process C is not included in the threshold calculation because the concentration is less than 1%. Note that, as a report is required in this example, the releases, disposals and transfers for recycling from all processes, including process C, are required to be reported, regardless of concentration and regardless of whether or not the quantity is used the threshold calculation.
4. The weight of the substance produced and released from process D is included in the calculation because it is a by-product, and the concentration threshold does not apply.
5. The weight of the substance contained in tailings is included in the threshold calculation because there is no concentration threshold for tailings.
6. The weight of the substance contained in waste rock is not included in the threshold calculation, because the concentration of the substance in the waste rock is less than 1%. The weight of the substance in the waste rock would also not be included when calculating disposals of the substance, because the concentration is less than 1%.
7. The total is the value that must be compared to the 10-tonne reporting threshold. This value is only used to determine that a report is required for the Part 1A substance. A subsequent calculation must be done to obtain the actual value of releases, disposals, and transfers for recycling that must be reported.

4.3 Calculating Releases, Disposals and Transfers for Recycling of Part 1A Substances

If the reporting threshold for a Part 1A substance is met (as discussed in section 4.2), a subsequent calculation is required to determine the quantities of that substance that are released, disposed of and transferred for recycling. If the reporting threshold is met, **all releases, disposals and transfers for recycling of that substance must be reported, regardless of their concentration or quantity and regardless of whether or not the quantity is used in the threshold calculation.** The only exception to this is for disposals of Part 1A substances in waste rock where

the substance is at a concentration of less than 1%. In the case of waste rock, the 1% concentration threshold for Part 1A substances applies to both the threshold calculation and disposal calculation.

4.4 Reporting Releases, Disposals and Transfers for Recycling of Part 1A Substances

All releases, disposals and transfers for recycling of Part 1A substances must be reported in tonnes.

Note that even if on-site releases, disposals or off-site transfers for recycling are zero, a report must be submitted for a Part 1A substance, once the 10-tonne reporting threshold has been met.

5. Reporting for Part 1B Substances – Alternate Threshold Substances

Part 1B substances have significant environmental and human health impacts at relatively low levels. They occur naturally in the environment, but human activities can concentrate them to toxic levels. Because minimal releases of Part 1B substances may result in significant adverse effects, the reporting thresholds for Part 1B substances are lower than those for Part 1A substances. As such, these substances are commonly referred to as the “alternate threshold substances.”

5.1 Reporting Criteria for Part 1B Substances

In general, any person who owns or operates a contiguous facility, a portable facility, or an offshore installation must submit a report for a Part 1B substance if both of the following criteria are met:

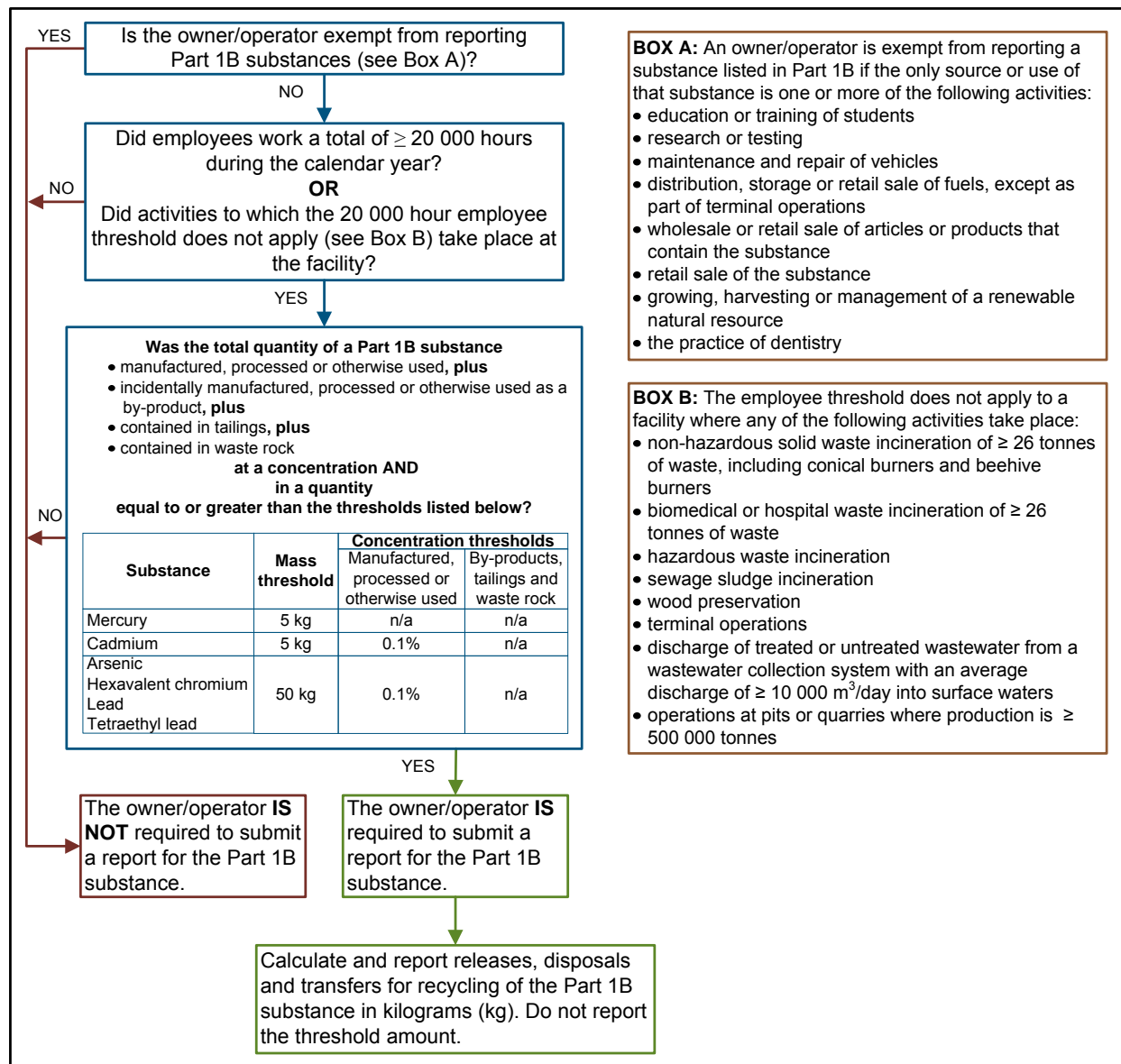
1. employees work a total of $\geq 20\,000$ hours, or activities to which the employee threshold does not apply (see Table 3) take place at the facility, and
2. the **total amount** of the Part 1B substance
 - manufactured, processed or otherwise used, **plus**
 - incidentally manufactured, processed or otherwise used as a by-product, **plus**
 - contained in tailings, **plus**
 - contained in waste rock that is not clean or inert (see section 3.7.4)
 at the concentrations specified in Table 12, **is greater than or equal to the mass threshold** specified in Table 12.

Figure 3 illustrates the steps for determining if a report for Part 1B substances is required.

Table 12. Concentration and Mass Thresholds for Part 1B Substances

Substance	Occurrence of the Substance	Concentration Threshold (by Weight)	Mass Threshold (kg)
Mercury	manufactured, processed or otherwise used	any concentration	5
	incidentally manufactured, processed or otherwise used		
	contained in tailings		
	contained in waste rock		
Cadmium	manufactured, processed or otherwise used	0.1% or more	5
	incidentally manufactured, processed or otherwise used	any concentration	
	contained in tailings		
	contained in waste rock		
Arsenic Hexavalent chromium Lead Tetraethyl lead	manufactured, processed or otherwise used	0.1% or more	50
	incidentally manufactured, processed or otherwise used	any concentration	
	contained in tailings		
	contained in waste rock		

Figure 3. Reporting for Part 1B Substances



5.1.1 Part 1B Substance Qualifiers

Mercury, cadmium, arsenic, hexavalent chromium and lead are listed with the qualifier “and its compounds.” The pure element and any compound, alloy or mixture of any Part 1B substance must be reported as the equivalent weight of the metal itself. For example, if potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$, molecular weight = 294 grams per mole [g/mol]) is used, only the mass contribution of hexavalent chromium ($2 \times 52\text{ g/mol}$) in $\text{K}_2\text{Cr}_2\text{O}_7$ should be included in the threshold calculation for hexavalent chromium.

Note that lead has an additional qualifier: the lead contribution from tetraethyl lead, stainless steel, brass and bronze alloys should be excluded from threshold calculations for lead. Tetraethyl lead

should be treated as a pure compound. If required, separate reports should be submitted for lead (and its compounds) and tetraethyl lead, with the reporting criteria applied to each substance separately.

5.2 Calculating the Reporting Threshold for Part 1B Substances

When calculating the reporting threshold, include the quantity of a Part 1B substance that is:

- manufactured at a concentration equal to or greater than the concentration threshold (if any);
- processed at a concentration equal to or greater than the concentration threshold (if any);
- otherwise used at a concentration equal to or greater than the concentration threshold (if any);
- a by-product, at any concentration, released on-site to the environment or disposed of on- or off-site;
- contained in tailings, at any concentration; and
- contained in waste rock, at any concentration.

Do not include quantities of a Part 1B substance contained in any of the sources that should not be considered, as listed in Table 4.

As noted previously, quantities of substances disposed of in inert or clean waste rock do not need to be included in threshold calculations. However, the quantity of arsenic contained in inert or clean waste rock can be excluded only if the concentration of arsenic is < 12 mg/kg of waste rock.

5.3 Calculating Releases, Disposals and Transfers for Recycling of Part 1B Substances

If the reporting threshold for a Part 1B substance is met (as discussed in section 5.2), a subsequent calculation is required to determine the quantities of that substance that are released, disposed of and transferred for recycling. If the reporting threshold is met, **all releases, disposals and transfers for recycling of that substance must be reported, regardless of their concentration or quantity and regardless of whether or not the quantity is used in the threshold calculation.**

5.4 Reporting Releases, Disposals and Transfers for Recycling of Part 1B Substances

All releases, disposals and transfers for recycling of Part 1B substances must be reported in kilograms (kg).

Note that even if on-site releases, disposals or off-site transfers for recycling are zero, a report must be submitted for a Part 1B substance once the mass reporting threshold has been met.

6. Reporting for Part 2 Substances – Polycyclic Aromatic Hydrocarbons

Polycyclic aromatic hydrocarbons (PAHs) may be used as commercial chemicals, incidentally manufactured in certain industrial processes, or contained in tailings. There are 29 PAHs listed in Part 2 of the NPRI substance list. For a list of these PAHs, consult the NPRI website: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=6A1C06B9-1.

6.1 Reporting Criteria for Part 2 Substances

With the exception of facilities where wood preservation using creosote takes place (see below), reporting for PAHs is based on the quantities of PAHs that are released, disposed of or transferred for recycling as a result of incidental manufacture or from the generation of tailings. A person who owns or operates a contiguous facility, a portable facility, or an offshore installation must submit reports for PAHs if both of the following criteria are met:

1. employees work a total of $\geq 20\,000$ hours, or activities to which the employee threshold does not apply (listed in Table 3) take place at the facility; and
2. the sum of all PAHs released, disposed of or transferred off-site for recycling as a result of incidental manufacture and/or as a result of the generation of tailings is ≥ 50 kg.

Wood preservation facilities using creosote must report for Part 2 substances, regardless of quantities and regardless of the number of hours worked by employees. See section 3.6.2 and the *Guidance for Wood Preservation Facilities Reporting to the NPRI* (www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=29B3E589-1) for more information.

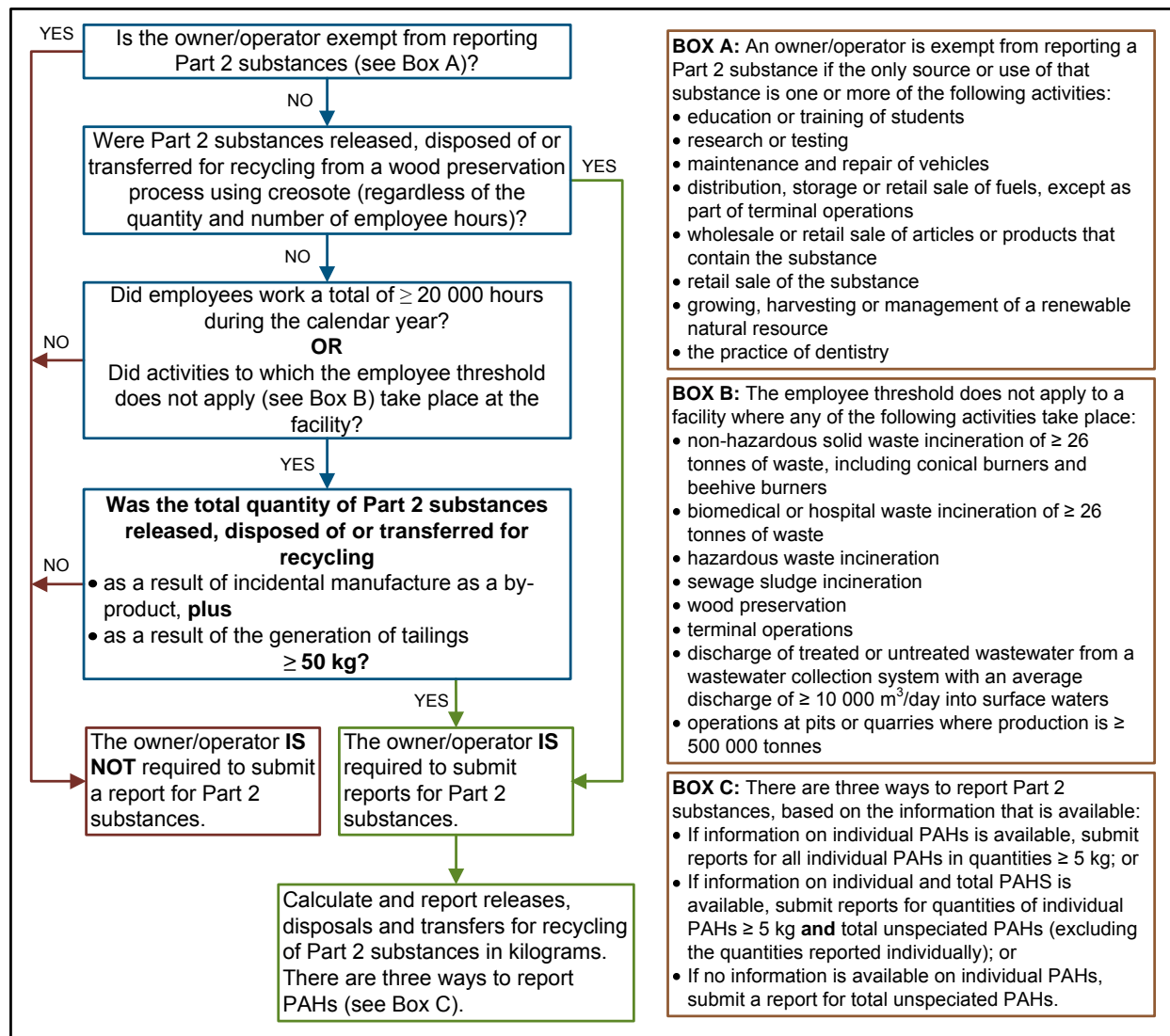
Figure 4 illustrates the steps for determining if reports for Part 2 substances are required, and, if so, what information must be reported.

6.2 Calculating the Reporting Threshold for Part 2 Substances

The sum of the quantities of individual PAHs incidentally manufactured and/or contained in tailings should be compared to the 50 kg threshold. In some cases, only information on unspecified PAHs may be available, or a combination of information on individual and unspecified PAHs may be available. Add the quantities of each individual PAH and the quantity of unspecified PAHs to determine if the 50 kg reporting threshold is met.

Do not include anthracene (CAS RN 120-12-7) and naphthalene (CAS RN 91-20-3) when determining the reporting threshold for PAHs. Although anthracene and naphthalene are PAHs, they are NPRI Part 1A substances. Therefore, they are subject to Part 1A reporting requirements.

Figure 4. Reporting for Part 2 Substances



6.3 Reporting Releases, Disposals and Transfers for Recycling of Part 2 Substances

All releases, disposals and transfers for recycling of Part 2 substances must be reported in kilograms.

Releases, disposals and transfers for recycling must be reported for the individual PAHs, even though the 50 kg threshold applies to the aggregate total of all 29 PAHs. Depending on the information that is available, there are three ways to report PAHs (illustrated in Figure 4 and summarized in Table 13). If the 50 kg threshold is met, or if wood preservation using creosote takes place at the facility, and information on releases, disposals and transfers for recycling for individual PAHs is available, those PAHs that are incidentally manufactured and released, disposed of or transferred for recycling in amounts $\geq 5\text{ kg}$ must be reported individually.

If only a combination of information on individual and total PAHs is available, quantities of individual PAHs in amounts ≥ 5 kg and quantities of “total unspciated PAHs” should both be reported. If the only available information is for total PAHs, total unspciated PAHs should be reported.

Note that total unspciated PAHs does not mean the sum of the 29 individual PAHs. In order to avoid double-counting when reporting both individual and total unspciated PAHs, the quantities of individual PAHs that are reported separately should not be included in the quantity reported for total unspciated PAHs. In addition, do not include release, disposal and transfer for recycling quantities of the two PAHs listed in Part 1A (anthracene and naphthalene) when reporting for total PAHs.

Facilities using creosote for wood preservation must report for PAHs regardless of the quantity of PAHs released, disposed of or transferred for recycling or the number of hours worked by employees. Depending on the information available to the facility, reports can be submitted for: individual PAHs released, disposed of or transferred for recycling in quantities ≥ 5 kg; a combination of individual PAHs in quantities ≥ 5 kg and total PAHs; or total PAHs.

Table 13. How to Report Polycyclic Aromatic Hydrocarbons

Type of information available	Comparison to thresholds	What to report
Quantities of individual PAHs	<ul style="list-style-type: none"> • Add quantities of individual PAHs • If the total is ≥ 50 kg, reporting is required 	<ul style="list-style-type: none"> • Report quantities of individual PAHs that are incidentally manufactured and released, disposed of or transferred for recycling in quantities ≥ 5 kg • Quantities of individual PAHs that are < 5 kg are not required to be reported
Combination of quantities of individual PAHs and quantity of total PAHs	<ul style="list-style-type: none"> • Add quantities of individual and total PAHs • If the total is ≥ 50 kg, reporting is required 	<ul style="list-style-type: none"> • Report quantities of individual PAHs that are ≥ 5 kg, and • Report total unspciated PAHs (not including quantities of individual PAHs) • Quantities of individual PAHs that are < 5 kg are not required to be reported
Quantity of total PAHs	<ul style="list-style-type: none"> • If total PAHs are ≥ 50 kg, reporting is required 	<ul style="list-style-type: none"> • Report total unspciated PAHs

7. Reporting for Part 3 Substances – Dioxins, Furans and Hexachlorobenzene

Polychlorinated dibenzo-p-dioxins (PCDDs or dioxins), polychlorinated dibenzofurans (PCDFs or furans) and hexachlorobenzene (HCB) are released primarily as by-products of industrial and combustion processes; they are also found as contaminants in certain pesticides or chlorinated solvents. HCB may also be found as a contaminant in the wood preservative pentachlorophenol (PCP). These substances are toxic under CEPA 1999, and are slated for virtual elimination.

HCB and 17 dioxin and furan congeners are listed in Part 3. For a list of these congeners, consult the NPRI website: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=6A1C06B9-1.

7.1 Reporting Criteria for Part 3 Substances

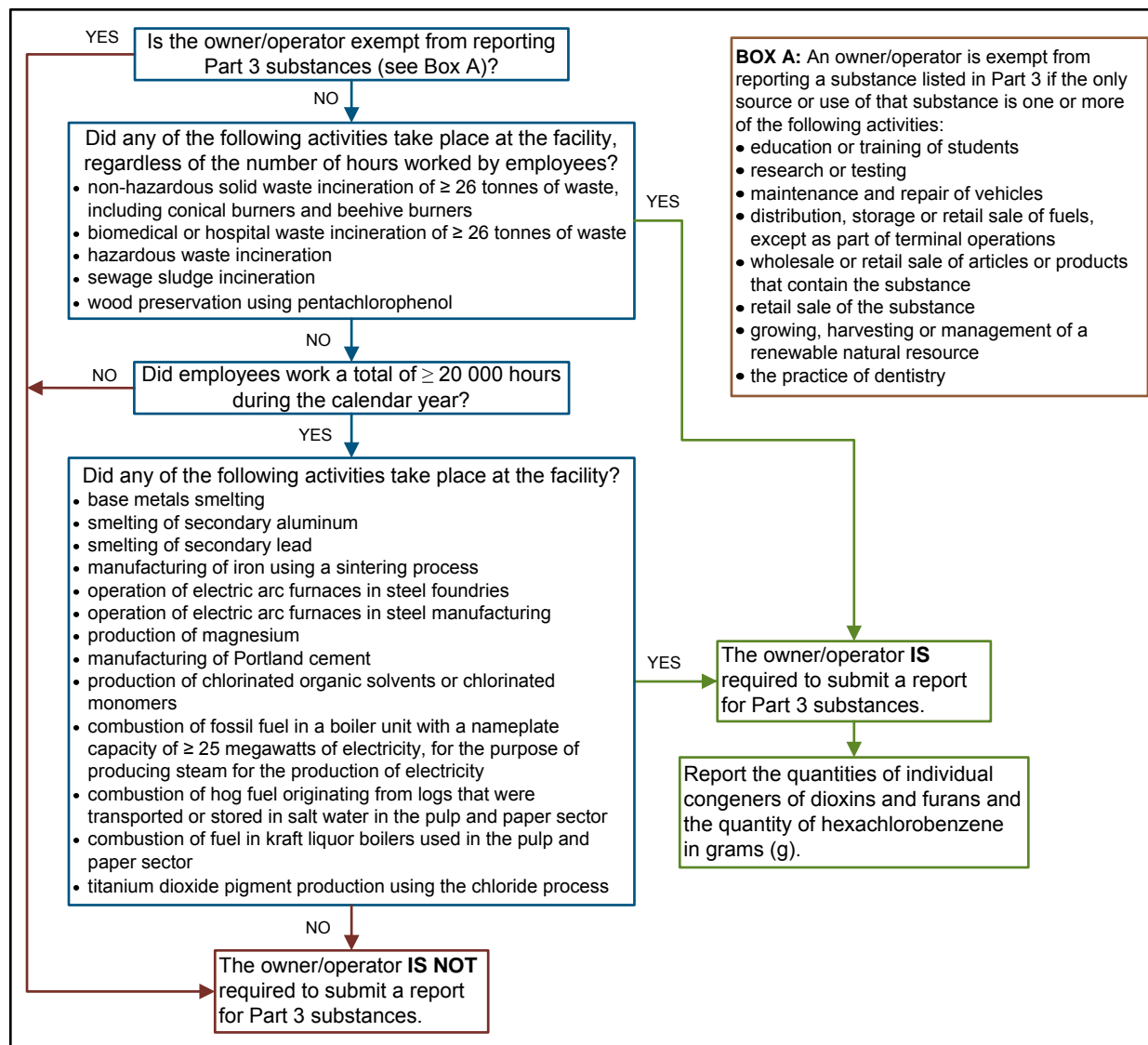
Reporting for dioxins, furans and HCB is mandatory for a contiguous facility, a portable facility or an offshore installation where the activities specified in Table 14 take place, regardless of quantity or concentration. These activities are described in sections 3.6.2, 7.1.1 and 7.1.2. The employee threshold applies to some of these activities, but does not apply to others, as indicated in Table 14. For those activities to which the employee threshold applies, both criteria must be met (i.e., the activity must take place, and the employee threshold must be met). For activities to which the employee threshold does not apply, reporting for dioxins, furans and HCB is mandatory, regardless of the number of hours worked by employees.

Table 14. Activities for Which Reports on Dioxins, Furans and Hexachlorobenzene Are Required

Employee Threshold	Activity
Employee threshold does not apply	non-hazardous solid waste incineration of ≥ 26 tonnes of waste, including conical burners and beehive burners
	biomedical or hospital waste incineration of ≥ 26 tonnes of waste
	hazardous waste incineration
	sewage sludge incineration
	wood preservation using pentachlorophenol
Employee threshold applies	base metals smelting (copper, lead, nickel or zinc only)
	smelting of secondary aluminum
	smelting of secondary lead
	manufacturing of iron using a sintering process
	operation of electric arc furnaces in steel foundries
	operation of electric arc furnaces in steel manufacturing
	production of magnesium
	manufacturing of Portland cement
	production of chlorinated organic solvents or chlorinated monomers
	combustion of fossil fuel in a boiler unit, with a nameplate capacity of ≥ 25 megawatts of electricity, for the purpose of producing steam for the production of electricity
	combustion of hog fuel originating from logs that were transported or stored in salt water in the pulp and paper sector
combustion of fuel in kraft liquor boilers used in the pulp and paper sector	
titanium dioxide pigment production using the chloride process	

Figure 5 illustrates the steps for determining if a report for Part 3 substances is required, and, if so, what information must be reported.

Figure 5. Reporting for Part 3 Substances



7.1.1 Activities for Which Part 3 Substances Must Be Reported, Regardless of Employee Hours

The activities to which the employee threshold does not apply (see Table 14) are described in section 3.6.2. Wood preservation activities are also described in section 3.6.2. However, only wood preservation using PCP triggers mandatory reporting of Part 3 substances. PCP, by its chemical structure, is a close surrogate to HCB. PCP is derived from HCB by substituting one of HCB's six chloro-substituents with a hydroxyl group. Given its chemical similarity to HCB and that its manufacturing ingredients contain the precursors for dioxin and furan production (i.e., chlorinated

aromatics), the manufacture of PCP often results in the incidental manufacture of HCB, dioxins and furans.

7.1.2 Activities for Which Part 3 Substances Must Be Reported if the Employee Threshold Is Met

The following sections describe the activities listed in Table 14 to which the employee threshold applies.

Smelting

Smelting is the melting of raw or scrap materials to produce metal for further processing into metal products. The smelting process is typically accompanied by a chemical change in which impurities are removed.

Base metals smelting

“Base metals” refer to copper, lead, nickel or zinc. Base metals smelting does not include smelting of aluminum, secondary lead or any other metals.

Smelting of secondary aluminum

“Secondary aluminum” refers to aluminum-bearing scrap or materials. Secondary aluminum smelting involves pre-cleaning and smelting, both of which may produce emissions of dioxins and furans.

Smelting of secondary lead

“Secondary lead” refers to lead-bearing scrap or materials, other than lead-bearing concentrates derived from a mining operation. Facilities engaged in smelting of lead-bearing concentrates derived from a mining operation are considered to be base metal smelters.

Manufacturing of iron using a sintering process

“Sintering” means to cause something to become a coherent mass by heating without melting, or the growth of contact area between two or more initially distinct particles at temperatures below the melting point but above one half of the melting point (in Kelvin). In sintering operations, dioxins and furans may be formed as by-products during high-temperature decomposition or combustion of raw materials containing chlorine and organic compounds.

Operation of electric arc furnaces in steel foundries and in steel manufacturing

In an electric arc furnace, material is heated by an electric arc. Dioxins, furans and HCB may be formed as by-products during high-temperature decomposition or combustion of raw materials containing chlorine and organic compounds.

Production of magnesium

Production of magnesium from magnesium chloride by electrolysis may result in the generation of dioxins, furans and HCB.

Manufacturing of Portland cement

Portland cement is a fine greyish powder consisting of four basic materials: lime, silica, alumina and iron compounds. Cement production involves heating the raw materials to a very high temperature in a rotating kiln to induce chemical reactions that produce a fused material called clinker. The cement clinker is further ground into a fine powder, and then mixed with gypsum to form Portland cement.

Production of chlorinated organic solvents or chlorinated monomers

This activity is limited to the intentional manufacturing of chlorinated organic solvents or chlorinated monomers, and does not include coincidental production.

Combustion of fossil fuel in a boiler unit, with a nameplate capacity of ≥ 25 megawatts of electricity, for the purpose of producing steam for the production of electricity

This activity includes fossil fuel combustion at electric power generation utilities and large industrial facilities co-generating electric power using waste heat from industrial processes. Fossil fuel is fuel that is in a solid or liquid state at standard temperature and pressure, such as coal, petroleum or any liquid or solid fuel derivatives. It does not include natural gas or other fuels that are gases at ambient pressure and temperature. Fuel combustion in diesel generators is not included in this activity.

Combustion of hog fuel originating from logs that were transported or stored in salt water in the pulp and paper sector

Pulp and paper boilers burning salt-laden wood are unique to British Columbia. Dioxins and furans are emitted from the burning of salt-contaminated hog fuel. Chlorine is absorbed by the bark of logs transported and stored in salt water. The bark stripped from logs is ground up with other waste wood to produce hog fuel, which is used as boiler fuel to produce heat and electrical energy.

Combustion of fuel in kraft liquor boilers used in the pulp and paper sector

A kraft liquor boiler burns black liquor, composed mostly of lignin, which is the residue from the digester in a kraft (sulphate) pulping process. The boiler recovers chemical products from the combusted black liquor, which are later recycled. It also produces steam, which is used in mill process operations.

Titanium dioxide pigment production using the chloride process

This activity is limited to titanium dioxide pigment manufactured by the chloride process, not the sulphate process.

7.2 Reporting Releases, Disposals and Transfers for Recycling of Part 3 Substances

The information that needs to be reported for Part 3 substances depends on the method used to determine the quantities released, disposed of and transferred for recycling. There are three possible scenarios:

- quantities are determined using CEMS, PEM or source testing;
- quantities are estimated using other methods; or
- no information is available.

To determine if a report is required, the quantities determined using CEMS, PEM or source testing must be compared to the level of quantification (LoQ). LoQ is defined in CEPA 1999 as “the lowest concentration that can be accurately measured using sensitive but routine sampling and analytical methods.” Table 15 lists estimated LoQs for dioxins, furans and HCB, determined by Environment Canada for gases, liquids and solids.

Table 15. Estimated Level of Quantification for Dioxins, Furans and Hexachlorobenzene

Material State	Estimated Level of Quantification	
	Dioxins and furans ⁽¹⁾	Hexachlorobenzene
Gaseous ⁽²⁾	32 picograms (pg) toxic equivalents (TEQ)/m ³	6 nanograms (ng)/m ³
Liquid ⁽³⁾	20 pg TEQ/L	70 ng/L
Solid ⁽⁴⁾	9 pg TEQ/g	2 ng/g

- (1) See section 7.2.1 for an explanation of toxic equivalents (TEQ).
- (2) Environment Canada, 1999. Use these values to determine whether concentrations in releases to air from stacks and other sources are above, equal to or below the LoQ.
- (3) The LoQ for concentrations of dioxins and furans in liquids was extrapolated from the effective LoQ for 2,3,7,8-TCDD in the *Pulp and Paper Mill Effluent Chlorinated Dioxins and Furans Regulations*. Use 70 ng/L as the estimated LoQ for concentrations of HCB in liquids (Environment Canada, 1997).
- (4) Environment Canada, 2000. Use these values to determine whether concentrations of dioxins and furans or HCB in solid materials are above, equal to or below the LoQ. Incinerator bottom ash, pollution-abatement residues and sludge are examples of solid materials containing dioxins and furans or HCB.

Measured concentrations must be compared to the appropriate LoQ indicated in Table 15 for each type of release, disposal and site transfer for recycling. If measured quantities are greater than or equal to the LoQ, the quantities must be reported. If measured quantities are less than the LoQ, reporting the quantities is optional.

If quantities of dioxins, furans and HCB are estimated using mass balance, emission factors or engineering estimates, the quantities that are released, disposed of or transferred for recycling do not need to be compared to an LoQ, and must be reported.

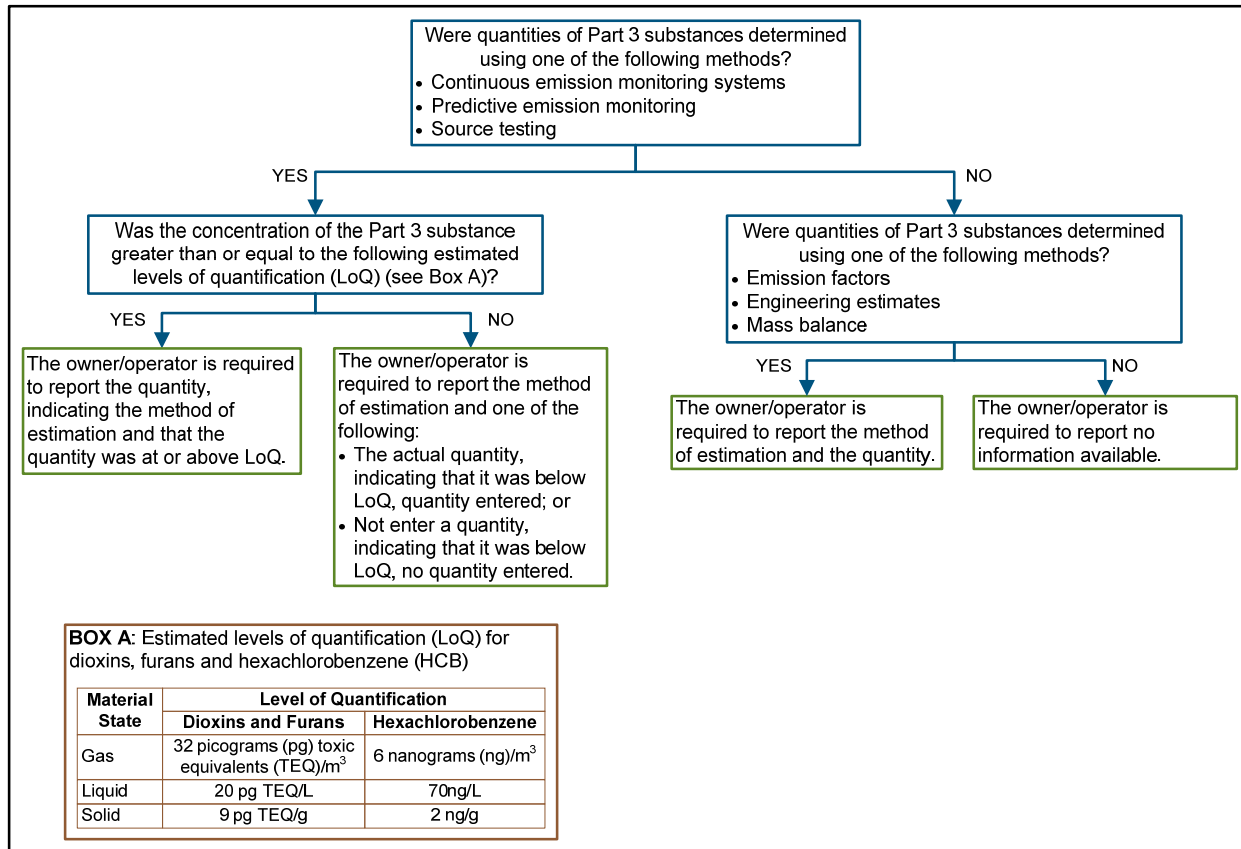
Table 16 summarizes the information that should be reported for Part 3 substances, depending on the method of estimation and the comparison to the LoQ. Figure 6 illustrates the steps for determining the information that should be reported for Part 3 substances.

Table 16. How to Report Dioxins, Furans and Hexachlorobenzene

Method of Estimation	Comparison to Level of Quantification (LoQ)	What Must be Reported
CEMS, PEM or source testing	at or above LoQ	Report the quantity, and report that the quantity is at or above the LoQ. ⁽¹⁾
CEMS, PEM or source testing	below LoQ	Report that the quantity is below the LoQ. The quantity can also be reported, but this is optional when it is below the LoQ. ⁽¹⁾
Mass balance	n/a	Report the quantity.
Site-specific emission factor or published emission factor	n/a	Report the quantity.
Engineering estimate	n/a	Report the quantity.
No information available	n/a	Report that no information is available. ⁽²⁾

- (1) Use the “? Help” link in OWNERS to determine what detail codes are used to indicate whether the quantity is at, above or below the LoQ.
- (2) “No information available” is an option under “Basis of Estimate” in OWNERS, which can be selected for Part 3 substances only.

Figure 6. How to Report Dioxins, Furans and Hexachlorobenzene



7.2.1 Reporting for Individual or Total Dioxins and Furans

Information on individual congeners of dioxins and furans must be reported if it is available. If the only information available is for total dioxins and furans, the total must be reported as toxic equivalents (TEQ).

Dioxins and furans are often found in complex mixtures, typically at extremely low concentrations, making it difficult to determine the cumulative toxicity of the mixture. Accordingly, toxic equivalency factors (TEFs) have been assigned to each dioxin and furan congener as weighting factors. These TEFs are assigned relative to the toxicity of 2,3,7,8-TCDD, the most toxic congener.

The TEFs listed in Table 17 should be used. To calculate TEQ, multiply the concentration (or quantity) of an individual congener by its respective TEF. For example, 1,2,3,4,7,8-HxCDF has a TEF of 0.1, and a sample concentration of 30 ng/kg 1,2,3,4,7,8-HxCDF is therefore equal to 3 ng TEQ/kg.

Table 17. Toxic Equivalency Factors for Dioxins and Furans

Congener	Abbreviation	CAS RN	Toxic Equivalency Factor
2,3,7,8-Tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	1746-01-6	1
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1,2,3,7,8-PeCDD	40321-76-4	0.5
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1,2,3,4,7,8-HxCDD	39227-28-6	0.1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1,2,3,6,7,8-HxCDD	57653-85-7	0.1
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1,2,3,7,8,9-HxCDD	19408-74-3	0.1
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1,2,3,4,6,7,8-HpCDD	35822-46-9	0.01
Octachlorodibenzo-p-dioxin	OCDD	3268-87-9	0.001
2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF	51207-31-9	0.1
2,3,4,7,8-Pentachlorodibenzofuran	2,3,4,7,8-PeCDF	57117-31-4	0.5
1,2,3,7,8-Pentachlorodibenzofuran	1,2,3,7,8-PeCDF	57117-41-6	0.05
1,2,3,4,7,8-Hexachlorodibenzofuran	1,2,3,4,7,8-HxCDF	70648-26-9	0.1
1,2,3,7,8,9-Hexachlorodibenzofuran	1,2,3,7,8,9-HxCDF	72918-21-9	0.1
1,2,3,6,7,8-Hexachlorodibenzofuran	1,2,3,6,7,8-HxCDF	57117-44-9	0.1
2,3,4,6,7,8-Hexachlorodibenzofuran	2,3,4,6,7,8-HxCDF	60851-34-5	0.1
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1,2,3,4,6,7,8-HpCDF	67562-39-4	0.01
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1,2,3,4,7,8,9-HpCDF	55673-89-7	0.01
Octachlorodibenzofuran	OCDF	39001-02-0	0.001

Source: North Atlantic Treaty Organization, 1988a and 1988b.

8. Reporting for Part 4 Substances – Criteria Air Contaminants

Air issues such as smog and acid rain result from the presence of, and interactions between, a group of pollutants known as criteria air contaminants (CACs) and related pollutants. There are seven CACs listed in Part 4 (see Table 18).

8.1 Reporting Criteria for Part 4 Substances

In contrast to the majority of NPRI substances, the thresholds for CAC emissions are based on the quantity released to air, rather than the quantity manufactured, processed and otherwise used. In general, any person who owns or operates a facility must submit a report to the NPRI for a Part 4 substance if the following criteria are met:

- employees work a total of $\geq 20\,000$ hours, or
- activities to which the employee threshold does not apply (see Table 3) take place at the facility, or
- employees work a total of $< 20\,000$ hours, and stationary combustion equipment is operated at the facility, or
- the facility is a pipeline installation where stationary combustion equipment is operated (see section 3.5 for the definition of a pipeline installation)

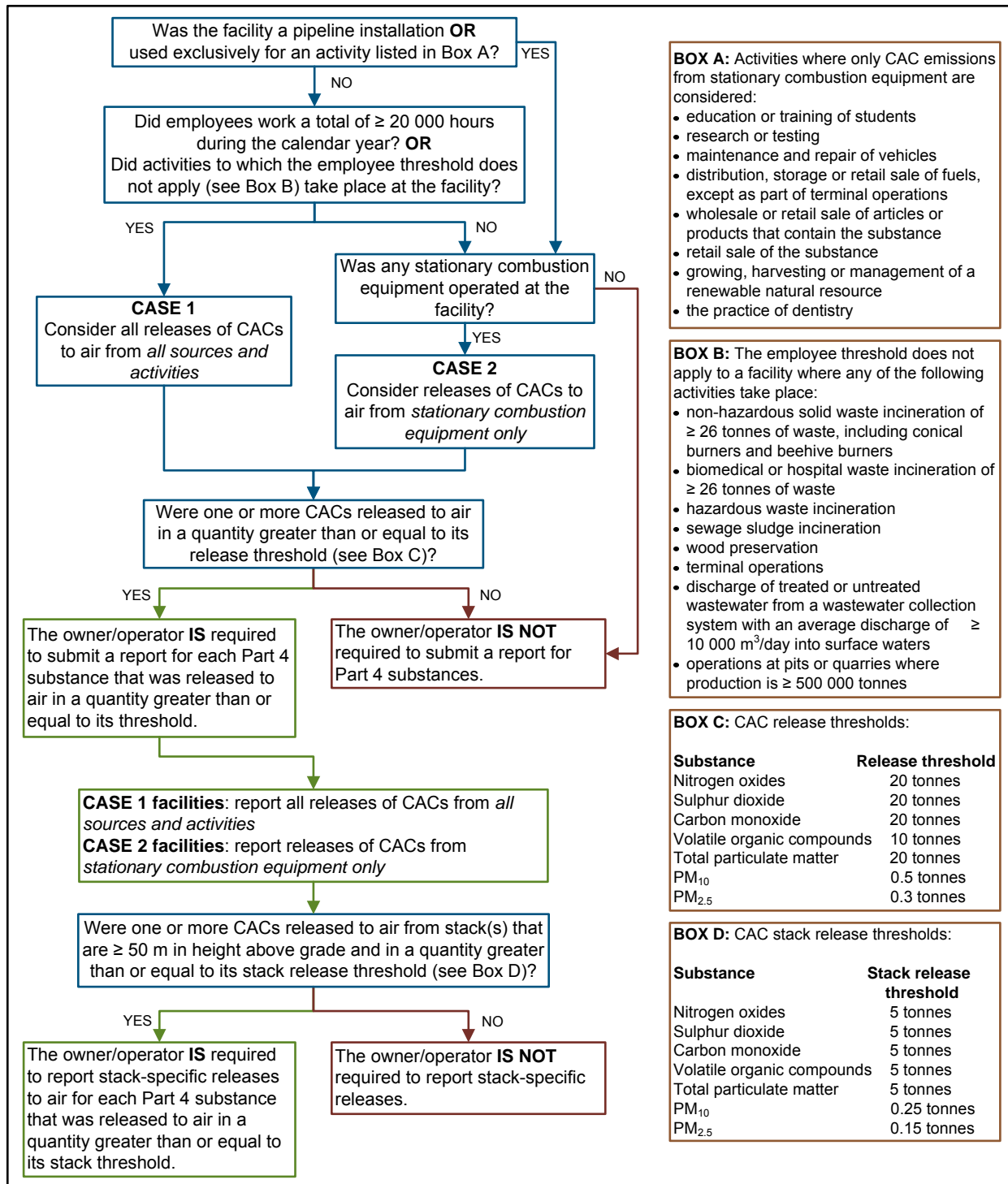
and the total amount of the Part 4 substance released to air is greater than or equal to the release threshold specified in Table 18.

Table 18. Release Thresholds for Criteria Air Contaminants

Criteria Air Contaminant	Release Threshold (tonnes)
Nitrogen oxides (expressed as nitrogen dioxide)	20
Sulphur dioxide	
Carbon monoxide	
Total particulate matter	10
Volatile organic compounds	
Particulate matter with a diameter less than or equal to 10 micrometres (PM ₁₀)	0.5
Particulate matter with a diameter less than or equal to 2.5 micrometres (PM _{2.5})	0.3

Figure 7 illustrates the steps for determining if a report for Part 4 substances is required, and, if so, what information must be reported. For further information on CACs and their reporting criteria, refer to the *Criteria Air Contaminants (CACs) Technical Source Guide for Reporting to the National Pollutant Release Inventory* (www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=3B695DF5-1) and the *Supplementary Guide for Reporting Criteria Air Contaminants (CACs) to the National Pollutant Release Inventory* (www.ec.gc.ca/Publications/default.asp?lang=En&xml=4A2D4BB8-BFA0-4129-A5A3-DBA372BD3B32).

Figure 7. Reporting for Part 4 Substances



8.1.1 Part 4 Substance Qualifiers

The following sections provide information on what should be included and excluded when reporting releases of CACs.

Nitrogen oxides

Nitrogen oxides (NO_x) include nitric oxide (NO) and nitrogen dioxide (NO_2). Since NO_x is a mixture, both NO and NO_2 must be expressed on an NO_2 -equivalent basis before the individual quantities are combined for the total NO_x release. Do not include nitrous oxide (N_2O) when calculating NO_x releases.

Sulphur dioxide

Sulphur dioxide (SO_2) is part of the sulphur oxide (SO_x) family of gases. However, reporting to the NPRI is only required for SO_2 , not SO_x . Therefore, the quantity of the other gases in the SO_x family, (i.e., sulphite, sulphur trioxide [SO_3] and sulphate [SO_4]) released should not be considered when calculating SO_2 releases.

Particulate matter

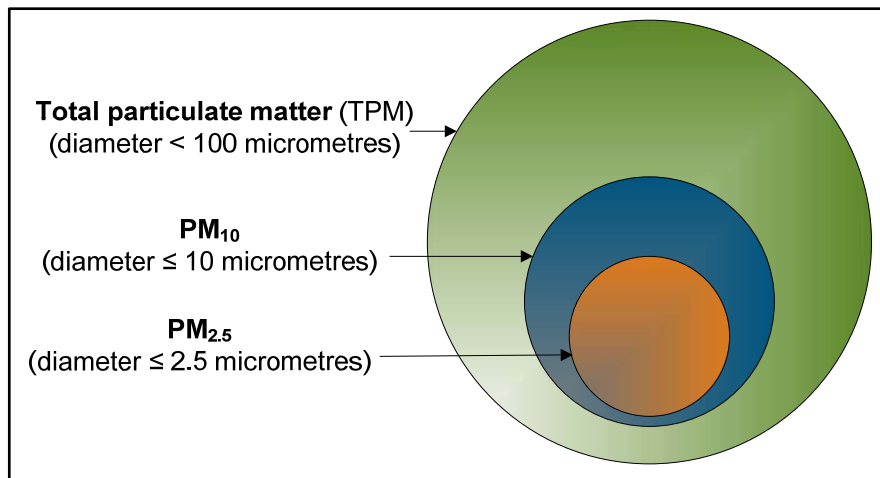
Three size fractions of particulate matter (PM) are required to be reported to the NPRI:

- total PM with a diameter less than 100 micrometres (TPM)
- PM with a diameter less than or equal to 10 micrometres (PM_{10})
- PM with a diameter less than or equal to 2.5 micrometres ($\text{PM}_{2.5}$)

As shown in Figure 8, the TPM fraction includes PM_{10} and $\text{PM}_{2.5}$, while PM_{10} includes $\text{PM}_{2.5}$. It is therefore impossible for $\text{PM}_{2.5}$ or PM_{10} releases to exceed TPM releases. It is also impossible for $\text{PM}_{2.5}$ releases to exceed PM_{10} releases.

TPM, PM_{10} and $\text{PM}_{2.5}$ emissions must be reported on a dry basis. Only filterable PM is reportable to the NPRI; condensable PM should not be included in release calculations.

Figure 8. Particulate Matter Size Fractions



Volatile organic compounds

Volatile organic compounds (VOCs) are an aggregate grouping of more than 1000 organic substances that readily volatilize and undergo photochemical reactions in the atmosphere.

VOCs should be reported as the total quantity of VOCs that participate in atmospheric photochemical reactions. Do not include any of the substances that are specified as exclusions in section 65 of Schedule 1 of the *Toxic Substances List* established under CEPA 1999 (for the list of excluded substances, see www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=0DA2924D-1&wsdoc=4ABEFFC8-5BEC-B57A-F4BF-11069545E434).

In addition, it is important to note the following:

- Approximately 100 VOCs are listed in Part 1A as individual substances. If the Part 1A criteria are met for any of these substances, they must be reported individually under Part 1A. They must also be included in threshold calculations for Part 4 VOCs, along with all other VOCs emitted.
- Base the VOC emissions on the total mass of all VOC substances emitted annually.
- In addition to total VOCs, facilities may be required to report additional information on speciated VOCs listed in Part 5 (see section 9 for more information).
- Total organic compounds (TOCs) and VOCs do not have the same definition. All VOCs can be considered TOCs; however, not all TOCs are considered VOCs.

8.2 Calculating Releases of Part 4 Substances

Table 19 lists some of the most common sources of CAC emissions, with a brief description of each. For more information on these sources of CACs, consult the CAC guidance documents in the *NPRI Toolbox* (www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=65A75CDF-1).

There are two possible scenarios that must be considered to determine which sources of CAC emissions must be included in threshold calculations. In Case 1, all CAC emission sources at the facility must be included in calculations. In Case 2, only the releases from the stationary combustion equipment at the facility should be included. Each case is described below.

Case 1: Facilities that must consider CAC emissions from all sources

All sources of CAC emissions must be considered when calculating releases (excluding the sources listed in Table 4), if:

- the facility is a contiguous facility, portable facility or offshore installation at which employees work $\geq 20\,000$ hours; or
- any of the activities to which the employee threshold does not apply (see Table 3) take place at the facility, regardless of the hours worked by employees.

Case 2: Facilities that must consider CAC emissions from stationary combustion equipment only

When calculating releases of Part 4 substances, facilities must consider only emissions from stationary combustion equipment if:

- employees work < 20 000 hours; or
- the only activities that take place at the facility are those listed in Table 5; or
- the facility is a pipeline installation.

A facility that is exempt from reporting Parts 1-3 substances (see section 3.7.3) may still be required to report releases of CACs from stationary combustion equipment.

Table 19. Common Sources of Criteria Air Contaminant Emissions

Source	Description
Abrasive blasting	Abrasive blasting is the process of cleaning or texturing materials with an abrasive material, such as sand, coal and smelter slag, as well as mineral, metallic or synthetic abrasives. The blasting process itself is a source of PM emissions, especially PM ₁₀ and PM _{2.5} .
Equipment leaks	Equipment connections, joints and interfaces can be the source of gaseous and liquid releases. If the equipment is handling a gaseous stream containing a CAC, the gaseous leak would result in a fugitive CAC release. Depending on the properties of a liquid (such as vapour pressure, temperature and pressure), a liquid release may also result in a fugitive CAC release.
External combustion equipment	This comprises any equipment with a combustion process that occurs at atmospheric pressure and with excess air, including heaters, furnaces, incinerators, boilers, flares, combustion chambers, external combustion engines such as steam engines and Stirling engines, steam/electric generating plants, and other commercial units.
Fermenting	The process of fermentation involves the use of yeast, bacteria, enzymes, etc., to break down complex organic compounds. Many industries use fermentation, including the production of bread, spirits, pharmaceuticals, fuel, beer and wine, as well as environmental bioremediation processes.
Internal combustion equipment	This comprises any equipment with a combustion process that occurs in a confined space and above atmospheric pressure, including gas turbines, natural-gas-fired reciprocating engines, gasoline and diesel industrial engines, and large, stationary diesel and dual-fuel engines.
Loading and unloading	Fugitive CAC emissions can result from the loading and unloading of vehicles or containers. If the material being transferred is a liquid, the resulting emissions would likely be in the form of VOCs. If the material is a solid, the resulting emissions would likely be in the form of PM.
Painting	VOCs are released from paint during its application and drying. This category includes, but is not limited to, the painting of vehicles, furniture, storage tanks and any other painted product. PM _{2.5} may also be emitted if paint is applied by pulverization.
Printing	VOCs are released from fixers, developers and solvents used during printing processes.
Road dust	TPM, PM ₁₀ and PM _{2.5} releases from road dust caused by vehicular traffic on unpaved roads within facility boundaries are required to be included in release calculations, when travel on these roads is ≥ 10 000 vehicle kilometres travelled per year.
Solvent use	Solvent use includes, but is not limited to, solvent degreasing, waste solvent reclamation, product formulation and commercial solvent use. Many solvents contain VOCs that are released during storage, through evaporation.
Stationary combustion equipment	This comprises any combustion equipment that needs to be stationary to function or operate properly, or is not capable of self-propulsion, including both internal and external combustion equipment.
Storage piles	Handling storage piles generates PM emissions. Pile moisture content, wind speed and proportion of aggregate fines all influence total emissions from a storage pile.
Storage tanks	These comprise any storage tanks containing fuels, solvents, hydrocarbons, paints and other solutions that contain VOCs. This includes fixed roof, external floating roof, domed external floating roof, internal floating roof, variable vapour space and pressure storage tanks.

Possible exclusion for Case 2 facilities

A facility that meets the Case 2 criteria is **not** required to submit reports for CACs, if all the following criteria are met:

- CACs are released to air only from stationary external combustion equipment; and
- the cumulative nameplate capacity of all stationary external combustion equipment is less than 10 million BTUs/hour (10.55 million kJ/hour); and
- the only type of fuel combusted in that equipment is commercial-grade natural gas, liquefied petroleum gas, Number 1 or 2 fuel oil, or any combination thereof.

This exclusion does not apply if any other fuels are burned in the stationary external combustion equipment.

8.3 Reporting Releases of Part 4 Substances

If the reporting criteria are met for a Part 4 substance, the releases to air of that substance must be reported in tonnes. Case 1 facilities must report all releases from all sources. Case 2 facilities should only report releases from stationary combustion equipment.

Stack-specific releases to air may also need to be reported for each stack ≥ 50 metres (m) above grade, if the stack-specific release threshold specified in Table 20 is met. The following information about each stack must also be reported: height above grade, equivalent diameter, average exit velocity and average exit temperature.

Table 20. Stack-Specific Release Thresholds for Criteria Air Contaminants

Criteria Air Contaminant	Stack Release Threshold (Tonnes)
Nitrogen oxides (expressed as nitrogen dioxide)	5
Sulphur dioxide	
Carbon monoxide	
Volatile organic compounds	
Total particulate matter	
Particulate matter with a diameter less than or equal to 10 micrometres (PM ₁₀)	0.25
Particulate matter with a diameter less than or equal to 2.5 micrometres (PM _{2.5})	0.15

Example of stack-specific CAC reporting

A facility releases 25 tonnes of NO_x to air from the whole facility. The facility has a stack that is 55 m above grade and that emitted 7 tonnes of NO_x. The following must be reported:

- 25 tonnes of NO_x must be first reported for total NO_x releases (NO_x has a total release threshold of 20 tonnes); and
- 7 tonnes of NO_x must be reported under the stacks requirement (NO_x has a stack release threshold of 5 tonnes).

9. Reporting for Part 5 Substances – Speciated Volatile Organic Compounds

Part 5 lists 75 VOCs in three groups (individual substances, isomer groups, and other groups and mixtures), which are subject to additional reporting requirements. These VOCs are collectively referred to as “speciated VOCs.” For a list of the speciated VOCs listed in Part 5, consult the NPRI website: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=6A1C06B9-1.

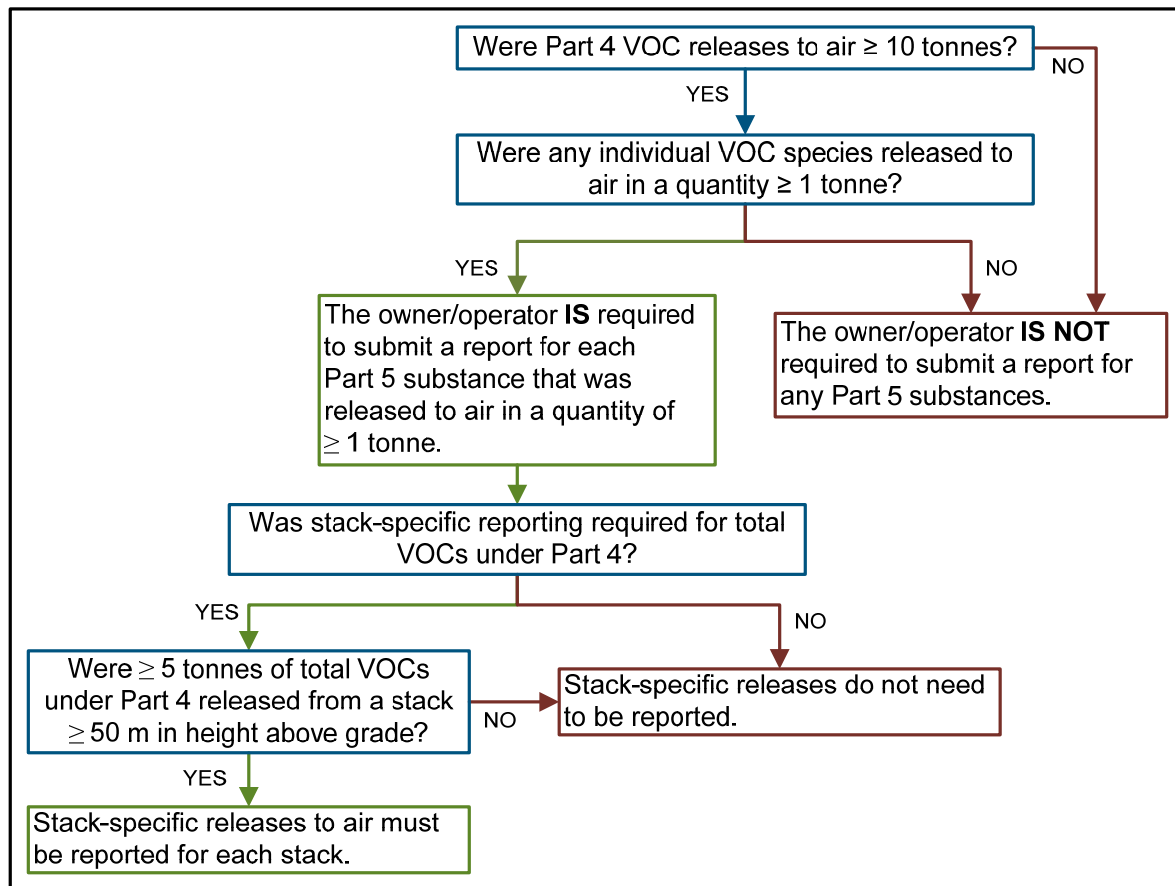
9.1 Reporting Criteria for Part 5 Substances

Like Part 4 substances, speciated VOCs must be reported based on quantities released to air. In general, any person who owns or operates a facility must submit a report to the NPRI for a Part 5 substance if both of the following criteria are met:

- Part 4 total VOCs released to air are ≥ 10 tonnes, and
- the total amount of the Part 5 substance released to air is ≥ 1 tonne.

Figure 9 illustrates the steps for determining if a report for Part 5 substances is required, and, if so, what information must be reported.

Figure 9. Reporting for Part 5 Substances



9.1.1 Part 5 Substance Qualifiers

Some Part 5 substances and groups of substances are qualified in terms of what needs to be included when calculating releases. The qualifiers, described in Table 21, determine whether a report will be required for a given substance.

Table 21. Part 5 Substance Qualifiers

Substance Qualifier	Substance(s) to Which the Qualifier Applies	Description
and its salts	aniline (CAS RN 62-53-3)	Aniline and all salts of aniline must be reported as an equivalent weight of the acid or base.
all isomers	anthraquinone, butane, butene (25167-67-3), cycloheptane, cyclohexene, cyclooctane, decane, dihydronaphthalene, dodecane, heptane, hexene (25264-93-1), methylindan (27133-93-3), nonane, octane, pentane, pentene, terpenes (68956-56-9) and xylene (1330-20-7)	Total of all isomers reported as an aggregate of the individual isomers
	hexane	Total of all isomers reported as an aggregate of the individual isomers, excluding n-hexane (110-54-3)
	trimethylbenzene (25551-13-7)	Total of 1,2,3-trimethylbenzene (526-73-8) and 1,3,5-trimethylbenzene (108-67-8) Excludes 1,2,4-trimethylbenzene (95-63-6)

9.2 Calculating Releases of Part 5 Substances

There are two scenarios that must be considered to determine what sources of VOC emissions must be included in threshold calculations for Part 5 substances.

Case 1: Facilities that must consider all sources of VOC emissions

All sources of VOC emissions must be considered when calculating releases (excluding the sources listed in Table 4), if:

- the facility is a contiguous facility, portable facility or offshore installation at which employees work $\geq 20\,000$ hours; or
- any of the activities to which the employee threshold does not apply (see Table 3) take place at the facility, regardless of the hours worked by employees.

Case 2: Facilities that must consider VOC emissions from stationary combustion equipment only

Only VOC emissions from stationary combustion equipment must be considered when calculating releases if:

- employees work $<20\,000$ hours; or
- the only activities that take place at the facility are those listed in Table 5; or
- the facility is a pipeline installation.

9.3 Reporting Releases of Part 5 Substances

If the reporting criteria are met for a Part 5 substance, the releases to air of that substance must be reported. Part 5 substances must be reported in tonnes. Stack-specific releases to air may also need to be reported for each stack ≥ 50 m above grade if both of the following criteria are met:

- stack-specific reporting is required for total VOCs under Part 4; and
- 5 tonnes or more of total VOCs under Part 4 are released to air from the stack.

Example of stack-specific speciated VOC reporting

A facility emits 28 tonnes of VOCs to air, 7 tonnes of which are emitted from a stack 65 m above grade. The remaining 21 tonnes are from storage/handling, fugitive releases, spills and other non-point sources. Three tonnes of styrene are released to air, 0.4 tonnes of which are from the 65 m stack. The following must be reported:

Part 4 (total VOCs)

- 28 tonnes of total VOCs must be reported under Part 4 (total VOCs have a release threshold of 20 tonnes)
- 7 tonnes of total VOCs must be reported for the facility's stack under Part 4 (total VOCs have a stack-specific release threshold of 5 tonnes)

Part 5 (speciated VOCs)

- 3 tonnes of styrene must be reported under Part 5 (speciated VOCs have a release threshold of 1 tonne)
- 0.4 tonnes of styrene must be reported for the facility's stack (speciated VOCs must be attributed to stack if the speciated VOC meets the facility-wide 1 tonne threshold, and the Part 4 VOC stack release threshold of 5 tonnes is met)
- the remaining 2.6 tonnes of styrene must be reported as being released from "other sources"

10. References

American Society for Testing and Materials. 2002. *Standard Practice for Determination of a Pooled Limit of Quantification*, D6259-98.

Canada. 1990. *Health of Animals Act*. Statutes of Canada 1990. Act assented to 19 June 1990. Available at: www.laws.justice.gc.ca/eng/H-3.3/index.html

Canada. 1999. *Canadian Environmental Protection Act, 1999*. Statutes of Canada 1999. Act assented to 14 September 1999. Available at: www.laws.justice.gc.ca/eng/C-15.31/index.html

Environment Canada. 1992. *Export and Import of Hazardous Wastes Regulations*. *Canada Gazette*, Part II, December 2, 1992.

Environment Canada. 1993. *User's Guide to Hazardous Waste Classification*. Ottawa (ON): Minister of Public Works and Government Services Canada.

Environment Canada. 1997. *Determination of LoQs for Measuring Hexachlorobenzene in Selected Solvents*. Draft Report AAQD 97-01, Analysis and Air Quality Division, Environmental Technology Centre.

Environment Canada. 1999. *Level of Quantification Determination: PCDD/PCDF and Hexachlorobenzene*. Analysis and Air Quality Division, Environmental Technology Centre.

Environment Canada. 2000. *Determination of Level of Quantification for Measuring HCB and PCDD/PCDF in Soil*, Draft. Analysis and Air Quality Division, Environmental Technology Centre.

Environment Canada. 2002. *Guidance for Wood Preservation Facilities Reporting to the NPRI*. In collaboration with the Canadian Institute of Treated Wood. Available at: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=29B3E589-1

Environment Canada. 2003a. *Criteria Air Contaminants (CACs) Technical Source Guide for Reporting to the National Pollutant Release Inventory*. Available at: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=3B695DF5-1

Environment Canada. 2003b. *Identification of Wastewater Treatment System Configuration and Process Characteristics*. Available at: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=57FBBE31-1

Environment Canada. 2003c. *NPRI Guidance Manual for the Wastewater Sector*. Available at: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=86E3D932-1

Environment Canada. 2003d. *Supplementary Guide for Reporting Criteria Air Contaminants (CACs) to the National Pollutant Release Inventory*. Available at: www.ec.gc.ca/Publications/default.asp?lang=En&xml=4A2D4BB8-BFA0-4129-A5A3-DBA372BD3B32

Environment Canada. 2004. *Phosphorus Guidance*. Available at: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=46C694F1-1

- Environment Canada. 2005a. *Wet Cooling Tower Guidance*. Available at: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=2ED8CFA7-1
- Environment Canada. 2005b. *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations*. *Canada Gazette*, Part II, June 1, 2005. Available at: www.ec.gc.ca/lcpe-cepa/eng/regulations/detailReg.cfm?intReg=84
- Environment Canada. 2006a. *Guidance for the Reporting of Welding Activities*. Available at: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=0FAE8C2F-1
- Environment Canada. 2006b. *Reporting Requirements for the Oil & Gas Sector*. Available at: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=5B72775D-1
- Environment Canada. 2007. *Reporting Guidance on Biosolids*. Available at: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=FC674F4F-1
- Environment Canada. 2008a. *Guidance on Estimating Road Dust Emissions from Industrial Unpaved Surfaces*. Available at: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=5DF2CF83-1
- Environment Canada. 2008b. *Pits and Quarries Guidance*. Available at: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=A9C1EE34-1
- Environment Canada. 2009a. *Notice with respect to tailings and waste rock reporting under the National Pollutant Release Inventory for 2006 to 2008*. *Canada Gazette*, Part I, December 5, 2009. Available at: www.gazette.gc.ca/rp-pr/p1/2009/2009-12-05/html/notice-avis-eng.html#d101
- Environment Canada. 2009b. *Guidance for the Reporting of Tailings and Waste Rock to the National Pollutant Release Inventory* (Version 1.4). Available at: www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=C115DEB3-1
- Environment Canada. 2010a. *Determining the Reporting Threshold for Total Reduced Sulphur Using Equivalence Factors*. Available at: www.ec.gc.ca/inrp-npri/default.asp?lang=en&n=AAECF4F6-1
- Environment Canada. 2010b. *Notice with respect to substances in the National Pollutant Release Inventory for 2010*. *Canada Gazette*, Part I, December 11, 2010. Available at: www.gazette.gc.ca/rp-pr/p1/2010/2010-12-11/html/notice-avis-eng.html#d101
- Environment Canada and Health Canada. 2010. Toxic Substances List. Available at: www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&xml=0DA2924D-E77E-2E16-A9D2-95388AD49B21
- Haynes WM. 2010. *CRC Handbook of Chemistry and Physics. 91st Edition. 2010-2011*. Boca Raton (FL): CRC Press.
- Howard PH, Neal M. 1992. *Dictionary of Chemical Names and Synonyms*. Chelsea (MI): Lewis Publishers.

North Atlantic Treaty Organization (NATO). 1988a. *International Toxicity Equivalency Factor (I-TEF) method of risk assessment for complex mixtures of dioxins and related compounds. Pilot study on international information exchange on dioxins and related compounds*. Committee on the Challenges of Modern Society. #186: 26 p.

NATO. 1988b. *Scientific basis for the development of the International Toxicity Equivalency Factor (I-TEF) method of risk assessment for complex mixtures of dioxins and related compounds. Pilot study on international information exchange on dioxins and related compounds*. Committee on the Challenges of Modern Society. #188: 56 p.

Statistics Canada. 2007. *North American Industry Classification System (NAICS) – Canada*. Catalogue 12-501-XIE. Ottawa (ON): Statistics Canada.

U.S. Environmental Protection Agency (EPA). 1995. *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources (AP 42)*, Fifth Edition. Research Triangle Park (NC): U.S. EPA. Available at: www.epa.gov/ttn/chief/ap42/index.html

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