



Guide for Reporting to the National Pollutant Release Inventory

2020 and 2021



Contact Information

For more information on the National Pollutant Release Inventory (NPRI), including guidance materials, annual data highlights reports and access to NPRI data, consult the [NPRI website](#). Questions and requests for assistance can be directed to Environment and Climate Change Canada:

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Should any inconsistencies be found between this guide and the official *Canada Gazette, Part I Notice with respect to substances in the National Pollutant Release Inventory for 2020 and 2021*, published on February 15, 2020, the Notice will prevail.

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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) contain information-gathering provisions that allow the Minister of Environment and Climate Change Canada 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 form the primary legislative basis for the NPRI.

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 releases and transfers from industrial, institutional, and commercial facilities in their communities.

The NPRI reporting requirements for the 2020 and 2021 reporting years were published in the [*Notice with respect to substances in the National Pollutant Release Inventory for 2020 and 2021*](#) in the Canada Gazette, Part I, on February 15, 2020. 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.

The requirements described in this guide apply to the 2020 and 2021 calendar years. Note that facility owners or operators must consider each year individually when determining if thresholds are met and if reporting is required. Quantities of substances that are released, disposed of, and recycled should be reported by the specified deadline for each year.



2. Reporting Deadlines and Changes to Reporting Requirements

2.1 Reporting deadline

Reporting is mandatory for facilities that meet the requirements of the NPRI Notice published in the *Canada Gazette, Part I*.

The deadline for reporting to the NPRI for the 2020 calendar year is June 1, 2021.

The deadline for reporting to the NPRI for the 2021 calendar year is June 1, 2022.

2.2 Changes to the substance list for 2020 and 2021

2.2.1 Additions to the substance list

Naphthenic acid fraction compounds (and their salts) have been added to the Part 1A substance list. For the purposes of reporting to the NPRI, naphthenic acid fraction compounds (NAFCs), also known as acid extractable organics, include:

1. Classically defined naphthenic acids: mono-carboxylic acids which include chain compounds and compounds with one or more alicyclic ring structures with the general formula $C_nH_{2n+Z}O_2$, where “n” indicates the carbon number and “Z” is referred to as the “hydrogen deficiency” (the number of hydrogen atoms that are lost as the structures become more compact) and is zero or a negative even integer (from -2 to -12). More than one isomer will exist for a given Z homolog, and the carboxylic acid group is usually bonded or attached to a side chain, rather than directly to the cycloaliphatic ring. The molecular weights differ by 14 mass units (CH_2) between n series and by two mass units (H_2) between Z series. Naphthenic acids are weak organic acids present primarily as their sodium naphthenate salts in oil sands process-affected water;
2. Diverse polar organic compounds present in bitumen and oil sands process-affected water. This includes several compound classes, including aromatic, adamantane, or diamondoid structures, sulfur- and nitrogen-containing compounds, and oxygenated acids. NAFCs extracted from oil sands process-affected water are primarily composed of larger, more complex compounds than commercial naphthenic acids, with a lower proportion of acyclic structures; and
3. Salts of naphthenic acids, expressed as the molecular weight of the acid.

For the purposes of reporting to the NPRI, NAFCs do not include naphthenic acids used solely in the context of commercial mixtures.

Two substances and one substance group have been added to the Part 1B list:

- 2-Propanone, reaction products with diphenylamine, also known as PREPOD [Chemical Abstracts Service Registry Number (CAS RN) 68412-48-6];
- 1,4-Benzenediamine, N,N'-mixed phenyl and tolyl derivatives, also known as BENPAT (CAS RN 68953-84-4); and
- Azo disperse dyes, a group of 26 azo disperse dyes with molar weights below 360 g/mol (limited to 27 specified CAS RNs).

2.2.2 Deletions from the substance list

Two substances have been removed from the Part 1A list:

- C.I. Disperse Yellow 3 (CAS RN 2832-40-8) [must now be reported as part of the azo disperse dyes group]; and
- Decabromodiphenyl oxide (CAS RN 1163-19-5).

Three substances have been removed from the Part 5 list

- Adipic acid (CAS RN 124-04-9);
- Heavy alkylate naphtha (CAS RN 64741-65-7); and
- White mineral oil (CAS RN 8042-47-5).

2.2.3 Change to a listed substance

Propylene glycol methyl ether acetate (PGMEA) has been moved from the Other Groups and Mixtures section to the Isomer Groups section of the Part 5 list. All isomers of PGMEA must now be reported: alpha-PGMEA (CAS RN 108-65-6), beta-PGMEA (CAS RN 70657-70-4), and mixtures of PGMEA (CAS RN 84540-57-8).

2.3 Changes to reporting requirements for dioxins, furans and hexachlorobenzene for 2020 and 2021

Facilities that produce iron ore pellets using an induration furnace are now required to report for dioxins, furans and hexachlorobenzene.

The toxicity equivalency factors for five dioxin and furan congeners have been updated (see Table 11):

- 1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin (CAS RN 40321-76-4);

- Octachlorodibenzo-*p*-dioxin (CAS RN 3268-87-9);
- 2,3,4,7,8-Pentachlorodibenzofuran (CAS RN 57117-31-4);
- 1,2,3,7,8-Pentachlorodibenzofuran (CAS RN 57117-41-6); and
- Octachlorodibenzofuran (CAS RN 39001-02-0).

2.4 Changes to reporting requirements for pollution prevention information for 2021

There are no changes to the requirements for reporting facility-level pollution prevention (P2) information between the 2019 and 2020 reporting years.

Beginning with the 2021 calendar year, facilities will be required to link their pollution prevention activities to specific substances. The questions about whether the facility's P2 plan addresses substances, energy conservation or water conservation, and whether the plan was updated during the calendar year, will be removed beginning in 2021. Facilities will still be asked whether they have a documented P2 plan, the reason for the plan (or the reason why P2 was not implemented), which P2 planning notice applies, and will be encouraged to provide a brief description of the plan in a comment field. In addition, facilities will have the option to indicate if they participated in another type of organized P2 plan or strategy (e.g., an industry association initiative).



3. General Information and Overview of Reporting Requirements

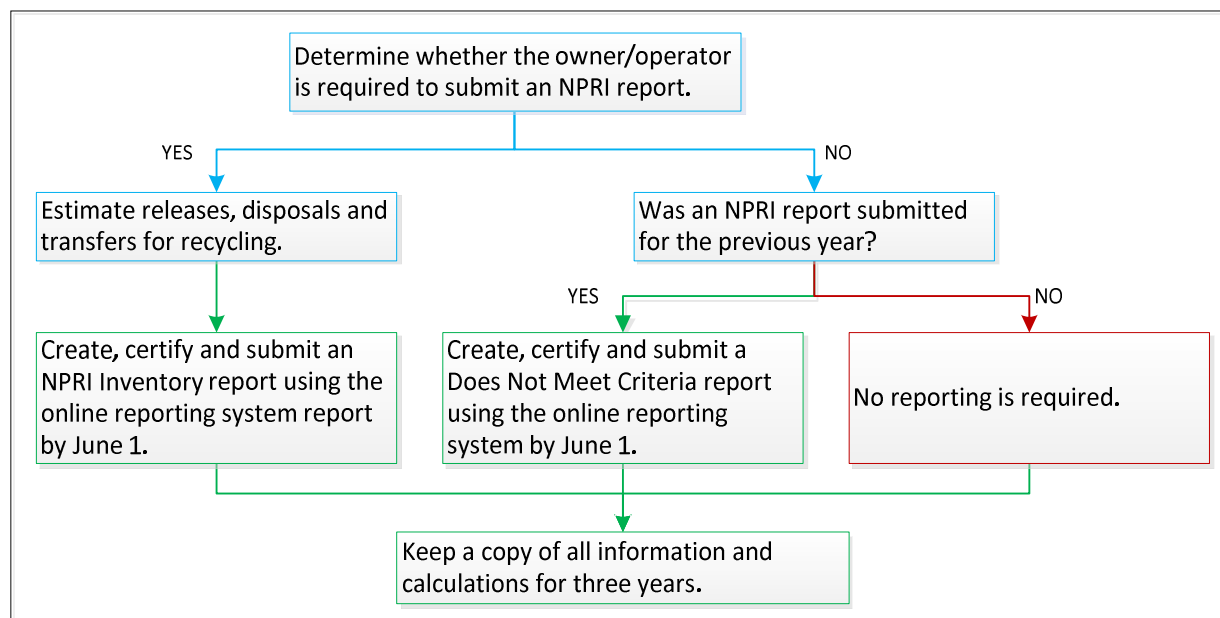
3.1 Introduction

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 substances from Parts 1 through 5 are presented in sections 4 through 9.

3.2 Process for reporting to the NPRI

The NPRI reporting process is outlined in Figure 1. An NPRI report can be created and submitted to Environment and Climate Change Canada using the [online reporting system](#). [Step-by-step instructions](#) and [video tutorials](#) for creating and submitting a report are available in the online reporting system and on the NPRI website.

Figure 1. Process for reporting to the NPRI



The owner/operator of a facility must review the specific reporting requirements applicable to their facility to determine if they are required to report to the NPRI. If the requirements are met, then the total quantities of NPRI substances released, disposed of, and transferred for recycling must be reported to the NPRI using the online reporting system, even if the total quantity is zero.

A facility that submitted a report in the previous year, but no longer meets NPRI reporting criteria for the current year, is required to submit a “Does Not Meet Criteria” report using the online system by the reporting deadline.

3.3 The *Canada Gazette* Notice – The legal basis for the NPRI

The legal basis for the NPRI is the *Notice with respect to substances in the National Pollutant Release Inventory for 2020 and 2021* published in the *Canada Gazette, Part I* (hereafter referred to as “the Notice”). The Notice is published under the authority of subsection 46(1) CEPA. It specifies that any person who owned or operated a facility during the 2020 or 2021 calendar years, under the conditions prescribed in the Notice, must provide certain information to the Minister of the Environment and Climate Change by the reporting deadline for that calendar year.

Reporting to the NPRI is mandatory. 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 section 272 of CEPA. 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 owner or operator of the facility as of December 31st of the given year is required to report to the NPRI, whether or not the ownership of the facility changes during the calendar year. If operations at a facility are terminated, the last owner or operator of the facility is required to report. An NPRI report may need to be submitted for a facility that is under decommissioning or in care or maintenance mode if the employee and/or substance-specific reporting criteria are met. Once reporting criteria are met for a substance, an NPRI report must be submitted for that substance regardless of the quantities released, disposed of, or transferred (even if the quantity is zero).

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.

Table 1. Overview of the NPRI Notice

Schedule	Part	Contents
1 – List of Substances	1	Lists 205 substances and groups of substances and is divided into groups A and B, based on thresholds and information to be reported (referred to as Part 1A and Part 1B substances)
	2	Lists 31 individual polycyclic aromatic hydrocarbons (PAHs)
	3	Lists 7 dioxins, 10 furans and hexachlorobenzene (HCB)
	4	Lists 7 criteria air contaminants (CACs)
	5	Lists 62 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
	5	Criteria for speciated VOCs listed in Schedule 1, Part 5
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 pollution prevention 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

3.4 Key concepts for understanding NPRI reporting requirements

This section is designed to help facility owners and operators understand the NPRI reporting requirements and determine if they are required to report to the NPRI. The following sections give a brief overview of the NPRI reporting requirements, the substance list, the employee threshold, and other key definitions. Additional definitions for terms used in this guide can be found in the glossary.

3.4.1 Facilities to which the NPRI reporting requirements apply

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 3.4.3);
- where specified activities to which the employee threshold does not apply take place (see section 3.4.3);

- where the reporting criteria for CACs are met, whether or not the employee threshold is met;
- that is a pipeline installation (defined in section 3.4.2); or
- that is subject to the [*Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations*](#).

In addition, the facility must meet any of the other reporting criteria (e.g., mass, concentration or activity thresholds) for substances on the NPRI substance list.

3.4.2 Definition of facility

The term “facility” refers to a contiguous facility, a portable facility, a pipeline installation or an offshore installation, as defined below. The different types of facilities have to consider different subsets of the NPRI substance list: contiguous facilities and offshore installations need to consider the substances in all Parts of the substance list; portable facilities need to consider substances in Parts 2-5; and pipeline facilities need to consider only Part 4 and 5 substances. See section 3.4.4 for more information on the Parts of the NPRI Substance list.

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. The owner or operator of a portable facility must submit a report for the location where the facility operated for the longest period of time in the calendar year, using the total quantity of releases, disposals, or transfers from all operating locations. For all other locations where the portable facility operated during the year, the dates, addresses and geographic coordinates are to be submitted in the facility comments section in the online reporting system.

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 raw or processed natural gas.

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.

3.4.3 The 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, regardless of function or location, 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 overtime, 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 take place at the facility.

Activities to which the employee threshold does not apply

If one or more of the following activities take place at the facility and other reporting criteria such as mass and concentration thresholds are met, the owner/operator of the facility must report to the NPRI regardless of the number of hours worked by employees:

- 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 $\geq 10\,000\text{ m}^3/\text{day}$ into surface waters
- Production of $\geq 500\,000$ tonnes at pits or quarries

The employee threshold does not apply to facilities where these activities occur because these activities release significant quantities of NPRI substances to the environment, while not necessarily employing enough people to meet the threshold. Detailed descriptions of these activities are provided in the glossary.

Facilities that are subject to the *Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations* are required to report releases, disposals, and transfers for recycling of hexavalent chromium (and its compounds), regardless of the number of employees and regardless of the 50 kg NPRI threshold.

3.4.4 The NPRI substance list: Parts 1-5

The [NPRI substance list](#) is divided into five parts, based on specific reporting criteria for each part. The reporting thresholds may be based on mass, concentration, or specific activities and are explained in detail in sections 5 through 9 of this guide. Table 2 provides an overview of the reporting requirements for each Part of the substance list.

Definitions for the manufacture, process, or otherwise use of a substance are found in the glossary and are further explained in section 5 of this guide.

3.4.5 Releases, disposals and transfers

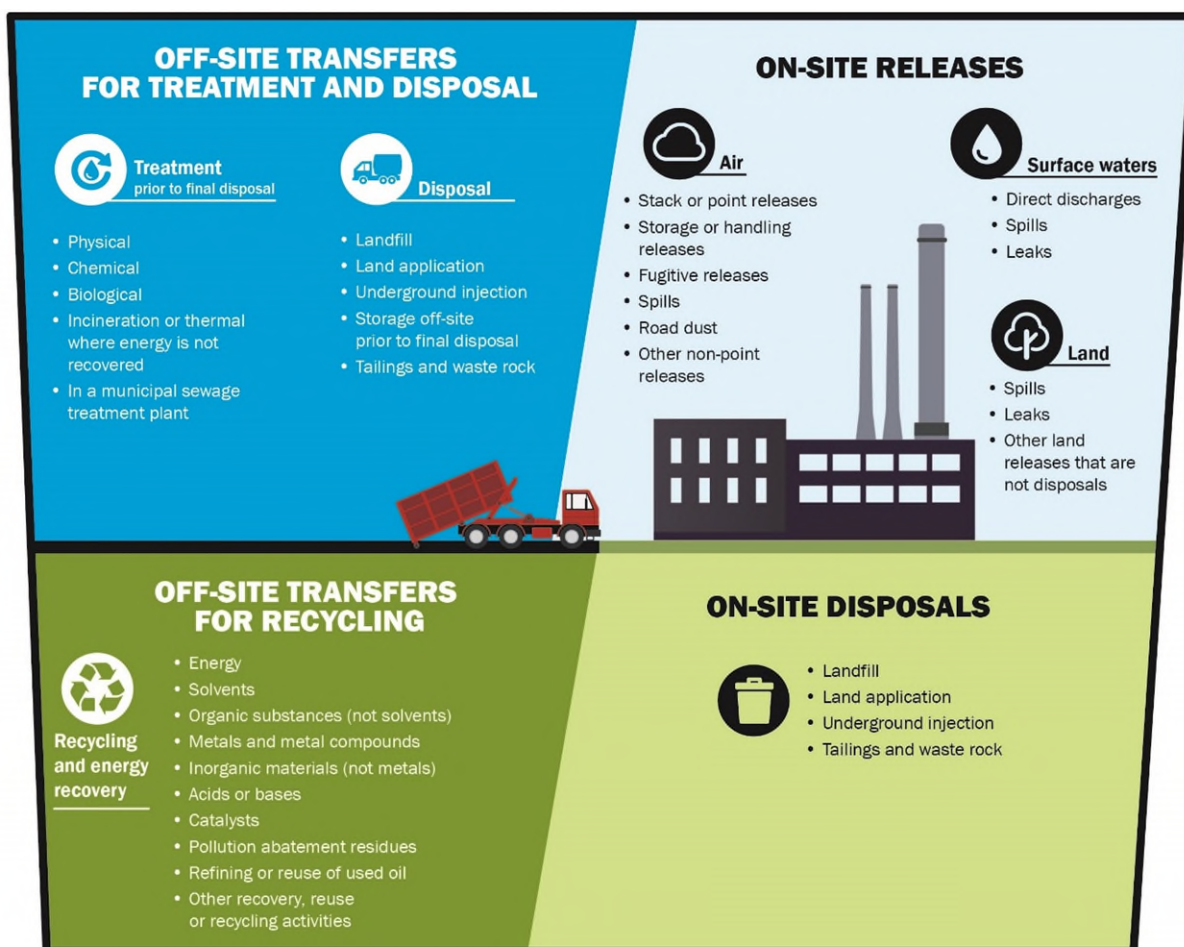
Once it has been determined that a facility meets the specific thresholds for an NPRI substance, the total quantities released, disposed of, or transferred must be reported.

Figure 2 gives an overview of the categories reportable to the NPRI. Detailed definitions for each of the reportable categories can be found in the glossary.

Table 2. Overview of NPRI reporting thresholds

Part	Substances	Mass Threshold	Reporting Thresholds
1A	<ul style="list-style-type: none"> 183 substances and groups of substances 	10 tonnes	TOTAL quantity of a substance: <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 that is not clean or inert at a concentration by weight of $\geq 1\%$
1B	<ul style="list-style-type: none"> 22 substances and groups of substances 	5 to 1 000 kilograms, depending on the substance	TOTAL quantity of a substance: <ul style="list-style-type: none"> manufactured, processed or otherwise used at a concentration by weight greater than or equal to the concentration threshold (0.000005% to 1%, depending on the substance, or regardless of concentration for mercury), 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 at any concentration
2	<ul style="list-style-type: none"> 31 polycyclic aromatic hydrocarbons (PAHs) 	50 kilograms	TOTAL of the quantities of PAHs at any concentration: <ul style="list-style-type: none"> incidentally manufactured and released, disposed of or transferred for recycling, plus contained in tailings disposed of during the calendar year
		Any quantity	Where wood preservation using creosote takes place, all releases, disposals and transfers for recycling must be reported, regardless of quantities or concentrations.
3	<ul style="list-style-type: none"> 7 dioxins 10 furans hexachlorobenzene 	Any quantity	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"> 62 speciated VOCs (individual VOCs, isomer groups and other groups and mixtures) 	1 tonne	Quantity released to air, if 10 tonnes or more of total VOCs are released to air (no concentration threshold applies)

Figure 2. Categories reportable to the NPRI



3.5 Exemptions from and exclusions to NPRI reporting requirements

3.5.1 Facilities exempt from all reporting requirements

NPRI reporting requirements do not apply if the only activities that take place at a facility are:

- exploration for oil or gas, or the drilling of oil or gas wells;
- discharge of treated or untreated wastewater from a wastewater collection system with an average discharge of $< 10\,000\text{ m}^3$ per day into surface waters; or
- production of $< 500\,000$ tonnes at pits or quarries. Open-pit mines are not included in the definition of a pit or quarry (see the glossary) and are subject to NPRI reporting requirements.

3.5.2 Exclusions for all substances

The quantity of a substance contained in any of the following items should not be included when calculating if the reporting threshold was met and when calculating and reporting releases, disposals or transfers for recycling:

- Articles that are processed or otherwise used. An article is defined as a manufactured item that does not release an NPRI substance when it undergoes processing or other use. See the glossary for examples of articles.
- 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. This includes NPRI substances contained in fertilizers and pesticides used for grounds maintenance, cleaning agents used for maintaining facility cleanliness, and paint used for building maintenance. The maintenance of process equipment (e.g., painting or cleaning manufacturing equipment with a solvent) is not excluded.
- Materials used for personal use by employees or other persons.
- Intake water or intake air, such as water used for process cooling or air used either as compressed air or for combustion.

The quantity of a substance that is manufactured, processed or otherwise used in the exploration for oil or gas or in the drilling of oil or gas wells should not be included when calculating if the reporting threshold was met and when calculating and reporting releases, disposals or transfers for recycling. This exclusion applies to all activities from initial exploration until the well is put into production.

In addition, vehicle emissions (not including unpaved road dust) should not be considered when calculating if the thresholds were met and when reporting releases, disposals or transfers for recycling. 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).

3.5.3 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 following activities:

- Education or training of students (for example, universities, colleges and schools).
- Research or testing.

- Maintenance and repair of vehicles (automobiles, trucks, locomotives, rail cars, ships or aircraft), except painting and stripping of vehicles or their components, or the rebuilding or remanufacturing of vehicle components. Substances used for 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.
- Distribution, storage or retail sale of fuels, except as part of terminal operations (defined in the glossary). The exemption for distribution, storage or sale of fuels does not include terminal operations.
- Wholesale or retail sale of the substance or articles or products that contain the substance. Materials or substances sent back to a manufacturer, supplier or recycler for reprocessing, repackaging, resale or for credit or payment are considered to be recycled, and the exemption for wholesale or retail sale does not apply.
- Growing, harvesting or management of renewable natural resources.
- The practice of dentistry.

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 above. Note, however, that these facilities are not exempt from reporting releases of Parts 4 and 5 substances from stationary combustion equipment.

In cases where a facility met the reporting criteria for a substance based on sources other than those listed above, the quantity of that specific substance from any exempt activities should also be excluded when reporting releases, disposals or transfers for recycling to the NPRI.

3.5.4 Exclusions for tailings and waste rock

The following sections describe the exclusions for unconsolidated overburden, inert waste rock and stable/inert constituents of tailings. Refer to the glossary for definitions of tailings and 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 be included in threshold calculations.

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.

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
- 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).

3.6 Additional reporting requirements for facilities operating electricity generating units

Facilities in all North American Industry Classification System (NAICS) codes that report releases of mercury or criteria air contaminants to air must assign those releases to each electricity generating unit that meets the following criteria:

1. The unit has a capacity of 25 MW or more.
2. The unit distributes or sells to the grid 33% or more of its potential electrical output.

An electricity generation unit means physically connected equipment that operates together to produce electricity for sale or distribution to the grid by means of thermal energy and is stationary when used, and is not in or on a machine that is self-propelled.

Potential electrical output means the quantity of electricity that would be generated by a unit in a calendar year if the unit were to operate at capacity at all times during that calendar year.

The 33% threshold must be assessed on an annual basis. If a unit meets the 33% threshold in a calendar year, but does not meet it in the subsequent year, reporting at the unit level for that unit is still required. The 33% threshold must be assessed on an annual basis. If a unit meets the 33% threshold in a calendar year, but does not meet it in the subsequent year, reporting at the unit level for that unit is still required. This requirement applies for three years. For example, if a unit met the 33% threshold only in 2018, emissions from the unit must be reported separately for 2018, 2019 and 2020 reports, but not from 2021 onwards (unless it were to meet the threshold again in a future year).

Facilities that meet the threshold requirements for unit-level reporting must also provide details about the unit, including:

- unit gross generating capacity
- commissioning year
- technology or fuel type
- whether the unit includes emissions from duct firing or other secondary combustion sources
- air pollutant controls installed and operating on the unit

3.7 Methods for estimating quantities of NPRI substances

3.7.1 Reasonable access to information

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. However, all releases, disposals or transfers off site for recycling must be included in threshold calculations and reported, unless otherwise specified, not just those that are measured or monitored.

An NPRI report is mandatory for any substances that meet the NPRI reporting thresholds, regardless of whether the substance is being measured or monitored for other jurisdictions. 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;
- 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.

3.7.2 Bases of estimate that can be used to report to NPRI

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

The reporting system only allows one basis of estimate (method) for each individual type of release, disposal and transfer. If more than one basis of estimate is used to arrive at a single quantity to be reported, select the basis of estimate that was used to calculate the majority of the value. Further explanation on the basis of estimate used can be provided in the comment fields found on the main pages for reporting releases, disposals and recycling in the online reporting system.

A description of these methods is provided in the following sections. Examples using these estimation methods can be found in the [NPRI Toolbox](#).

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 total flow rate of the stream being measured 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.

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.

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 quantity 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.

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. This method may not be suitable for many other sources, such as cases where chemical transformation of input streams occurs.

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:

$$E_x = A \times EF$$

Controlled Emissions = Uncontrolled emission $\times ((100 - \text{control efficiency})/100)$

Where:

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

A = Activity rate

EF = Emission factor

Care should be taken when using published emission factors, as some emission factors may be out of date or underestimate releases. Before using emission factors, facilities should find the most appropriate emission factors for their operations; ensure that they are as up-to-date as possible; and verify that they reflect actual emissions, particularly in cases where emission factors have been known to underestimate releases.

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.

3.7.3 Method detection limit and reporting of non-detect values

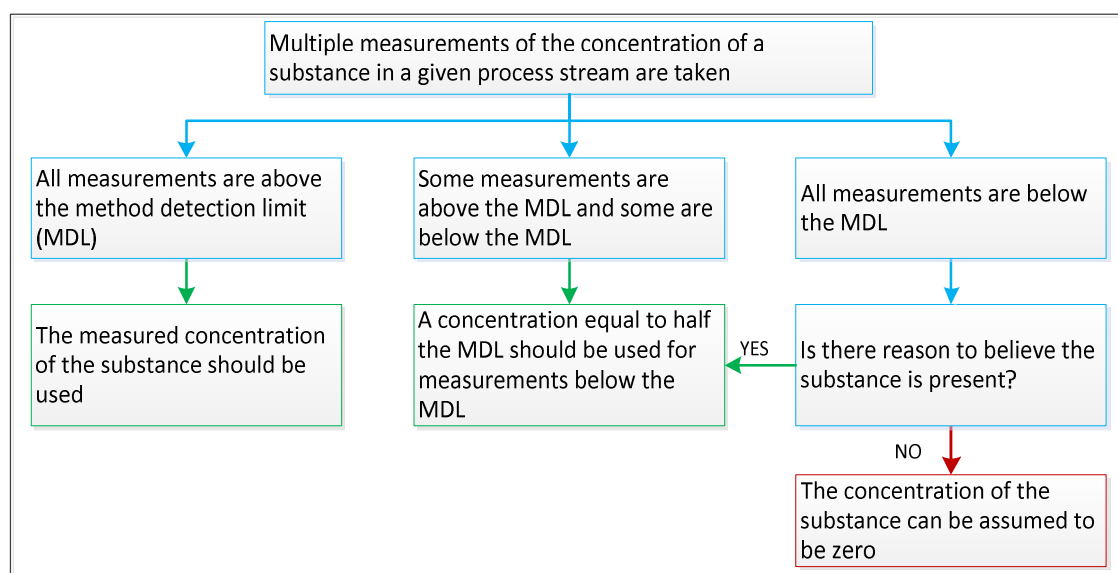
In NPRI reporting, the issue of measurements below the method detection limit (MDL) arises in several situations (Figure 3). The MDL is the smallest concentration of the substance under analysis (i.e., the analyte) that produces an instrumental response and that meets all analyte detection and identification 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.

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. If there is reason to believe that the substance is present, a value of half the MDL should be used to estimate the release.

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.

When using the MDL to estimate a direct discharge to water, or a quantity disposed in tailings or waste rock, the MDL must also be reported.

Figure 3. Reporting of non-detect values



3.7.4 Other guidance documents and tools

Environment and Climate Change Canada, the U.S. Environmental Protection Agency (US EPA), and industry associations provide resources to complete threshold calculations and to estimate releases, disposals and transfers for recycling of NPRI substances. These resources can be accessed through the [NPRI Toolbox](#). Useful information can also be found in Safety Data Sheets, and in permits and certificates of approval.

The [NPRI Toolbox](#) includes a number of tools:

- General Guidance
- Emission Calculation References
- Useful Equations and Conversion Factors
- Example Calculations
- Information on Fuel Combustion and Fugitive Emission Sources
- Sector-Specific Resources
- Substance-specific Guidance
- Additional Guidance and Resources



4. Information to be Reported

4.1 Facility information

Table 3 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.

4.2 Contact information

For each of the following, the name, position, 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 and Climate Change 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 they filed. All NPRI correspondence from Environment and Climate Change 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 and Climate Change Canada, if:

- there is a change in the name, 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.

Table 3. Facility information required to be reported

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) ⁽³⁾	<ul style="list-style-type: none"> Legal names of any Canadian parent companies and their percentage of ownership 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 and Climate Change Canada and used for reporting to the NPRI
North American Industry Classification System (NAICS) Canada 2017 code ⁽⁴⁾	<ul style="list-style-type: none"> The primary six-digit NAICS Canada code of the facility and the secondary and tertiary codes, if applicable.⁽⁴⁾
Provincial identification numbers	<ul style="list-style-type: none"> Any other identification numbers associated with the facility (e.g., greenhouse gas reporting program ID number) Facilities classified as NAICS 211110 must report all provincial license or identification numbers [e.g. Petrinex⁽⁵⁾] numbers associated with their NPRI ID

¹ 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 The parent company is the highest level company or group of companies that owns or directly controls the reporting facility. The parent companies of interest to NPRI are those Canadian companies that have greater than 10% ownership in the company.

⁴ 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](#).

⁵ Petrinex is a joint strategic organization supporting Canada's upstream, midstream and downstream petroleum industry and is currently represented by the Alberta Department of Energy (DOE), the Alberta Energy Regulator (AER) and the Saskatchewan Ministry of the Economy (ECON), and industry [represented by the Canadian Association of Petroleum Producers (CAPP) and The Explorers and Producers Association of Canada (EPAC)].

4.3 Pollution prevention activities

For the 2020 reporting year, facilities are required to report:

- Whether and why a pollution prevention (P2) plan was prepared;
- The name of the P2 notice, jurisdiction, or program for which the P2 plan is required;
- Whether an existing P2 plan was updated;
- Barriers to implementing a P2 plan;
- Whether the plan addressed substances, energy conservation or water conservation; and
- Information on P2 activities undertaken during the year.

For the 2021 reporting year, facilities are required to report:

- Whether and why a P2 plan was prepared;
- The name of the P2 notice, jurisdiction, or program for which the P2 plan is required;
- Information on P2 activities undertaken during the year; and
- The substances for which the P2 activities were undertaken.

For the 2021 reporting year, facilities are encouraged to provide a brief description of their P2 plan and they will be able to indicate if their P2 plan was prepared or implemented for an association or industry-led program.

Environment and Climate Change Canada analyzes P2 information and publishes a summary of the P2 information submitted by facilities in [Pollution Prevention in Practice](#). The published information is updated on an annual basis.

4.4 Comments

Comment fields are provided on many screens in the online reporting system. Comments can be used to provide additional information, such as details about a facility's operations, how a substance is used, details of pollution prevention activities, reasons for changes in quantities reported from the previous year, or the methods used to calculate reported quantities.

The information provided in comment fields can help users understand the context around the reported information. Clear and concise comments contribute to the understandability and completeness of the NPRI data set. Explanations of changes or anomalies in submitted data help to prevent unnecessary contact with facilities during the quality control process.

4.5 Other requirements

4.5.1 Statement of certification

A Statement of Certification (SOC) must be electronically signed and submitted with the NPRI report using the online reporting system. 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.

4.5.2 Record keeping

Pursuant to subsection 46(8) of CEPA, 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 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 three years.

4.5.3 Other reports

There are several other types of NPRI reports that can be filed using the online reporting system:

- Does Not Meet Criteria report: A facility that submitted a report for the previous year, but no longer meets NPRI reporting criteria for the current year, is required to submit a “Does Not Meet Criteria” report by the reporting deadline.
- Sale/Close/Purchase report: Submit a “sale/close/purchase” report when transfers of ownership occur, or if a facility closes during the calendar year.
- Update: An update to current and previous reports can also be submitted using the online reporting system.

4.6 Voluntary reporting

The NPRI also accepts voluntary reporting for NPRI substances when a facility does not meet the reporting requirements. Voluntary reports assist the NPRI in providing a more comprehensive description of releases and transfers of pollutants in Canada. A voluntary report for a release, disposal or transfer of a substance should be specified as such by selecting the appropriate option within the online reporting system.



5. Reporting for Part 1 Substances

5.1 Requirements for Part 1 substances

Part 1 of the NPRI substance list contains 205 substances or substance groupings that are divided into two categories: Part 1A and Part 1B. Part 1A and Part 1B reporting requirements share many similarities, with the main difference being that substances listed in Part 1B have lower mass and concentration thresholds compared to those in Part 1A. The following terms apply to both Part 1A and Part 1B substances.

Manufacture, process, or otherwise use

When reporting for substances listed on Part 1A or 1B, a facility must first consider the quantity of the substance manufactured, processed or otherwise used at the facility. Figure 4 gives an overview of activities to consider when calculating the quantity of Part 1 substances manufactured, processed, or otherwise used.

Figure 4. Activities to consider in the manufacture, process or otherwise use of an NPRI substance

Manufacture	<ul style="list-style-type: none">• For on-site use/processing• For sale/distribution• Incidentally as a by-product• As an impurity
Process	<ul style="list-style-type: none">• As a reactant• As a formulation component• As an article component• During repackaging• As a by-product
Otherwise use	<ul style="list-style-type: none">• As a physical or chemical processing aid• As a manufacturing aid• For ancillary/other use• As a by-product• Any other releases or disposals of the substance

Manufacture means to produce, prepare or compound an NPRI substance. It also includes the incidental production of an NPRI substance as a by-product. 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 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 glossary for definition), and the processing of a substance as a by-product. 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.

Otherwise use (or other use) means 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. For example, the use of trichloroethylene in the maintenance of manufacturing and process equipment is an example of an “other use” of that substance. Certain specified uses of substances are excluded and are listed in Section 3.5.2.

The quantity of a substance that is manufactured, processed, or otherwise used is not reported to the NPRI. Instead, if the manufacture, process, or otherwise use threshold is met, the quantity of the substance released, disposed of, or transferred off-site for recycling is required to be reported, even if the quantity is zero.

By-products

The term “by-product” refers to the quantity of an NPRI Part 1 substance that is incidentally manufactured, processed or otherwise used at the facility at any concentration, and released to the environment or disposed of. The quantity of a substance that is recycled or that remains in the final product is not considered to be a by-product for the purpose of the NPRI threshold calculation.

In general, if a quantity of a substance is intentionally manufactured, processed or otherwise used at a facility, then that quantity of the substance is not a by-product, even if it is unintentionally manufactured, processed or otherwise used at another step in the process.

Overall quantities of by-products can be significant, even though their concentration may be low. Therefore, the quantity of a substance that is a by-product must be included in the calculation of the reporting threshold, regardless of concentration. The by-product requirements only apply to Part 1 substances and are only used for the purpose of determining whether or not the mass threshold for a substance has been met.

Some examples of by-products are:

- Hydrogen fluoride is incidentally manufactured and released during aluminum smelting. Therefore, the hydrogen fluoride is a by-product and must be included 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 by-products, must be included in the calculation of the reporting threshold, regardless of concentration.

An example of when substances are not considered by-products:

- Metal cuttings, sent for disposal, contain alloyed chromium and nickel at a concentration of less than 1%. The chromium and nickel are essential components of the alloy; therefore, they are not incidentally processed and are not considered to be by-products. Consequently, the chromium and nickel in the metal cuttings do not need to be included in the calculation of the reporting threshold, because the substances are present at a concentration less than the concentration threshold of 1%.

5.2 Reporting for Part 1A substances – Core substances

Part 1A lists 183 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.

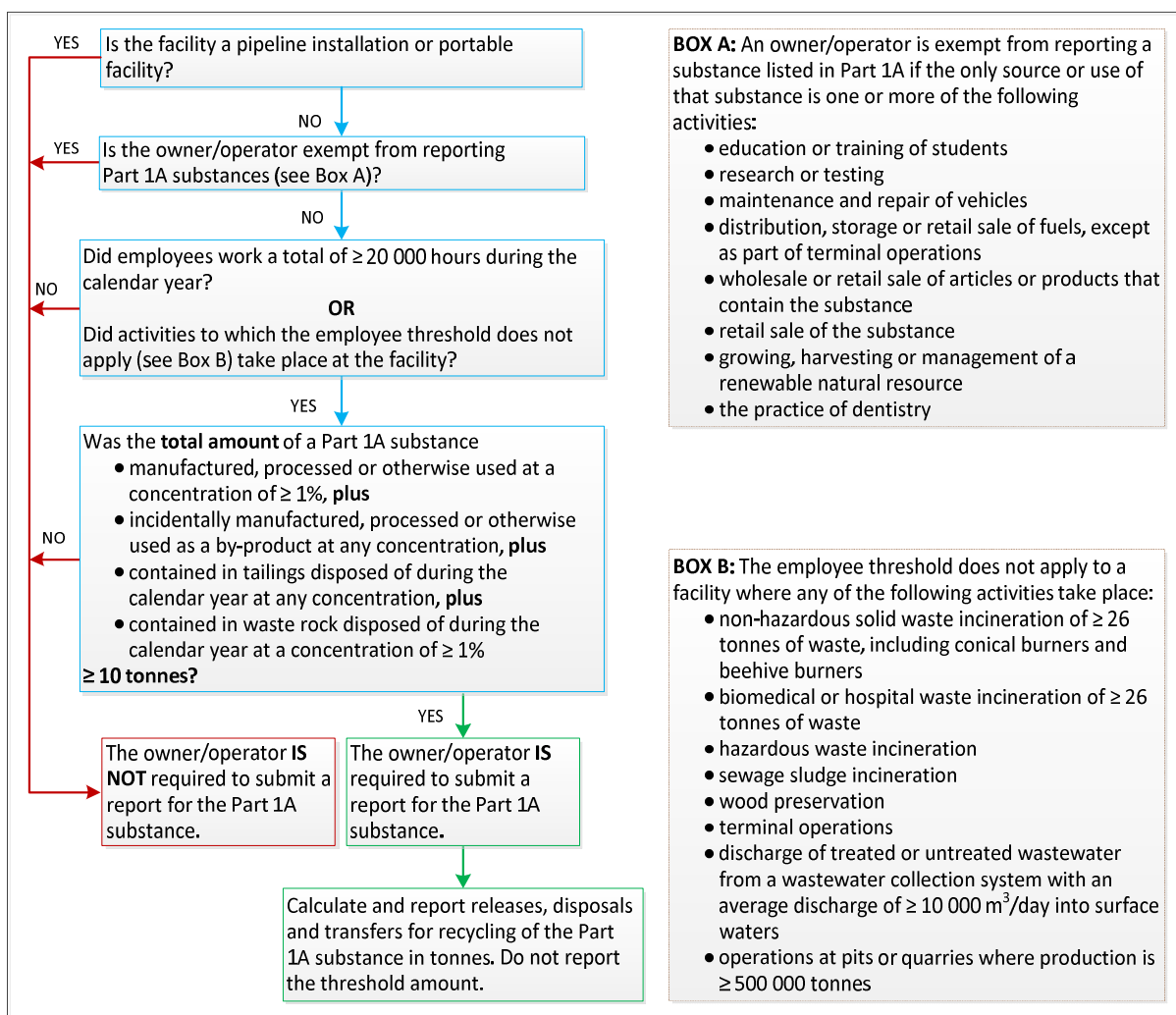
In general, any person who owns or operates a **contiguous facility or offshore installation** must submit an NPRI report for a Part 1A substance if both of the following criteria are met:

1. employees work a total of $\geq 20\,000$ hours, or activities to which the employee threshold does not apply (see Section 3.4.3) take place at the facility; and
2. the **total quantity** of the Part 1A substance present in the following scenarios is ≥ 10 tonnes:
 - manufactured, processed or otherwise used at a concentration (by weight) of 1% or more,
 - incidentally manufactured, processed or otherwise used as a by-product at any concentration,

- contained in tailings disposed of during the calendar year at any concentration, and
- contained in waste rock disposed of during the calendar year that is not clean or inert (see section 3.5.4) at a concentration (by weight) of 1% or more.

Figure 5 illustrates the steps for determining if a report is required for Part 1A substances.

Figure 5. Reporting for Part 1A substances



5.2.1 Part 1A substance qualifiers

Some Part 1A substances and groups of substances have additional qualifiers that specify the physical or chemical form, state or particle size of the substance that is to be included. The qualifiers, described in Table 4, help to determine whether a report will be required for a given substance.

Table 4. Qualifiers for Part 1A substances

Substance Qualifier	Substance(s) to Which the Qualifier Applies	Description
all isomers	<ul style="list-style-type: none"> cresol (CAS RN 1319-77-3) HCFC-122 (41834-16-6) HCFC-123 (34077-87-7) HCFC-124 (63938-10-3) xylene (1330-20-7) 	Total of all isomers reported as an aggregate of the individual isomers.
and its compounds	<ul style="list-style-type: none"> antimony copper manganese nickel 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.
	<ul style="list-style-type: none"> 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.
	<ul style="list-style-type: none"> vanadium 	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 (their) salts	<ul style="list-style-type: none"> 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) <i>N,N</i>-dimethylaniline (121-69-7) 4,6-dinitro-<i>o</i>-cresol (534-52-1) hydroquinone (123-31-9) Michler's ketone (90-94-8) naphthenic acid fraction compounds (no specific CAS RN applies) nitrilotriacetic acid (139-13-9) peracetic acid (79-21-0) phenol (108-95-2) <i>p</i>-phenylenediamine (106-50-3) pyridine (110-86-1) 	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	<ul style="list-style-type: none"> 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. Only releases to air of total reduced sulphur are required to be reported. Quantities of total reduced sulphur released to water, released to land, disposed of and transferred off-site for recycling do not have to be reported.

Substance Qualifier	Substance(s) to Which the Qualifier Applies	Description
fibrous forms only	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> asbestos (1332-21-4) 	Only asbestos that is brittle and readily crumbled (i.e., friable) should be reported.
fume or dust only	<ul style="list-style-type: none"> 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. Dust refers to solid particles generated by any mechanical processing of materials including crushing, grinding, rapid impact, handling, detonation, and decrepitation of organic and inorganic materials such as rock, ore, and metal. Dusts do not tend to flocculate except under electrostatic forces. A fume is an airborne dispersion consisting of small solid particles created by condensation from the gaseous state, in distinction to a gas or vapor. Fumes arise from the heating of solids. The condensation is often accompanied by a chemical reaction, such as oxidation. Fumes flocculate and sometimes coalesce.
in a solution at a pH of 6.0 or more	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> cyanides 	Includes the salts of hydrogen cyanide, but excludes organocyanides, nitriles and organometallic cyanide compounds.
total	<ul style="list-style-type: none"> ammonia 	Total of ammonia (NH ₃) (7664-41-7) and the ammonium ion (NH ₄ ⁺) (14798-03-9) in solution, expressed as ammonia.
	<ul style="list-style-type: none"> phosphorous 	Total of all phosphorus, not including yellow or white phosphorus (7723-14-0).
yellow or white only	<ul style="list-style-type: none"> phosphorous 	Total of the yellow and white allotropes of elemental phosphorus only.

5.2.2 Calculating the manufacture, process or otherwise use quantity for Part 1A substances

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

- manufactured, processed or otherwise used at a concentration equal to or greater than 1% by weight;

- incidentally manufactured, processed or otherwise used (a by-product), at any concentration, and released on-site to the environment or disposed of on- or off-site;
- contained in tailings disposed of during the calendar year, at any concentration; and
- contained in waste rock that is not inert and that is disposed of during the calendar year at a concentration equal to or greater than 1% by weight

Any release or disposal of an NPRI substance must be included in the otherwise used category. For example, the quantity of the NPRI substance contained in dust released to air from materials stored on site would be included, whether or not the material is used for a specific purpose at the facility. Another example is a spill of an NPRI substance to water or land during storage or handling.

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. Do not include quantities of substances more than once in manufacture, process or otherwise use calculations. For example, if a substance is processed and released, the release quantity does not need to be added to the process quantity.

Do not include quantities of a Part 1A substance contained in any of the sources that are excluded, as listed in Section 3.5.2, or from the activities listed in section 3.5.3.

A quantity of a substance that is transferred off-site for recycling and returned to the facility should be treated as the equivalent of newly purchased material. A quantity of a substance that is recycled on-site and re-introduced to a process stream (e.g., substances in ore processing water that are recycled back into the process from tailings) should be included in the threshold calculation only once.

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. Activities to consider in the manufacture, process or otherwise use of a substance are listed in Figure 4.

Facilities that repackage or transfer Part 1A substances between containers must consider the entire quantity of the substance contained in the original container or in bulk for threshold calculations.

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.

5.2.3 Example of calculating the reporting threshold for Part 1A substances

Table 5 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 quantity 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 5. 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 (that is not clean or inert)	20 000 000	0.00002	n/a
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 in 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.

5.2.4 Calculating releases, disposals and transfers for recycling of Part 1A substances

If the reporting threshold for a Part 1A substance is met, 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 exceptions to this are quantities of the substance:

- contained in the materials listed in section 3.5.2;
- that are manufactured processed or otherwise used in the activities listed in section 3.5.3; and
- contained in waste rock where the substance is at a concentration of less than 1% (see section 3.5.4).

5.2.5 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 the quantity manufactured, processed or otherwise used is not reported.

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

When total releases of a Part 1A substance are less than one tonne, a facility may choose to report the release as a total without specifying the environmental media (air, water, or land). Facilities are encouraged to report the break down by media, if the information is available.

5.3 Reporting for Part 1B substances – Alternate threshold substances

Part 1B substances may have significant environmental and human health impacts at relatively low 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.”

In general, any person who owns or operates a **contiguous 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 Section 3.4.3) take place at the facility, and
2. the **total quantity** of the Part 1B substance present in one or more of the following scenarios is greater than or equal to the mass threshold specified in Table 6:
 - manufactured, processed or otherwise used at or above the concentration specified in Table 6;
 - incidentally manufactured, processed or otherwise used as a by-product at any concentration;
 - contained in tailings at any concentration; and
 - contained in waste rock that is not inert and that is disposed of, at any concentration (see section 3.5.4)

In addition, a facility that is subject to the *Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations* must report for hexavalent chromium (and its compounds), regardless of the number of employees and regardless of the mass and concentration thresholds listed in Table 6. If the facility does not meet any other NPRI requirements, only a report for releases, disposals, or transfers of hexavalent chromium (and its compounds) is required.

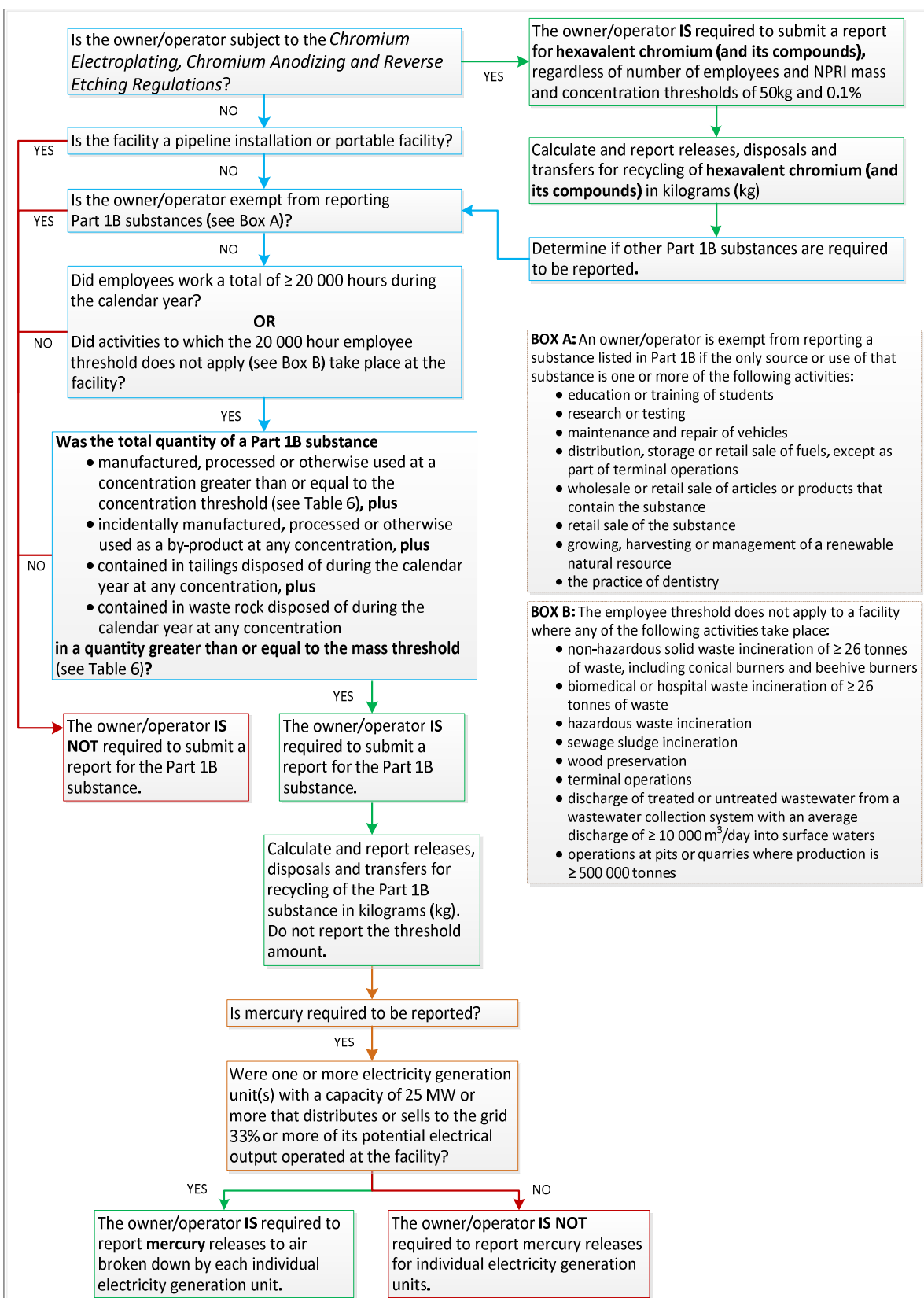
Figure 6 illustrates the steps for determining if a report for Part 1B substances is required.

Table 6. Mass and concentration thresholds for Part 1B substances

Substance/Substance Group	Mass Threshold (kg)	Concentration Threshold (by weight)
Acrylonitrile	1 000	0.1%
Arsenic (and its compounds)	50	0.1%
Azo disperse dyes	10	0.1%
1,4-Benzenediamine, <i>N,N'</i> -mixed phenyl and tolyl derivatives	50	1%
Bisphenol A	100	1%
Cadmium (and its compounds)	5	0.1%
Chlorinated alkanes, medium-chain, $C_nH_xCl_{(2n+2-x)}$, $14 \leq n \leq 17$	1 000	1%
Chlorinated alkanes, long-chain, $C_nH_xCl_{(2n+2-x)}$, $18 \leq n \leq 20$	1 000	1%
Cobalt (and its compounds)	50	0.1%
Hexavalent chromium (and its compounds) ⁽¹⁾	50	0.1%
Hydrazine (and its salts)	1 000	1%
Isoprene	100	1%
Lead (and its compounds)	50	0.1%
Mercury (and its compounds)	5	n/a
Nonylphenol and its ethoxylates	1 000	1%
2-Propanone, reaction products with diphenylamine	50	1%
Selenium (and its compounds)	100	0.000005%
Tetraethyl lead	50	0.1%
Thallium (and its compounds)	100	1%
Toluene-2,4-diisocyanate	100	0.1%
Toluene-2,6-diisocyanate	100	0.1%
Toluenediisocyanate (mixed isomers)	100	0.1%

¹ Any facility that is subject to the *Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations* must report any release, disposal, and transfer for recycling of hexavalent chromium (and its compounds), regardless of the number of employees and regardless of the 50 kg NPRI threshold.

Figure 6. Reporting for Part 1B substances



5.3.1 Part 1B substance qualifiers

Mercury, cadmium, arsenic, hexavalent chromium, lead, cobalt, selenium and thallium 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 ($K_2Cr_2O_7$, molecular weight = 294 grams per mole [g/mol]) is used, only the mass contribution of hexavalent chromium (2×52 g/mol) in $K_2Cr_2O_7$ 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 separate substance. If the criteria are met, separate reports should be submitted for lead (and its compounds) and tetraethyl lead, with the reporting criteria applied to each substance separately.

Hydrazine is listed with the qualifier “and its salts.” 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.

Toluenediisocyanate is listed with the qualifier “mixed isomers.” The total of all isomers occurring in mixtures must be reported.

Any substance whose molecular formula meets the category definition for medium-chain (C_{14-17}) or long-chain (C_{18-20}) chlorinated alkanes must be included when calculating the manufacture, process or otherwise use threshold quantity, and reported if the threshold is exceeded. In addition, chemical mixtures that contain substances that meet the medium-chain (C_{14-17}) or long-chain (C_{18-20}) chlorinated alkane category definition must also be considered. However, for mixtures, NPRI reporting facilities would only include the chlorinated alkane component of the chemical mixture that meets the respective category definition in threshold calculations and reported quantities.

5.3.2 Calculating the manufacture, process or otherwise use quantity for Part 1B substances

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

- manufactured, processed or otherwise used at a concentration equal to or greater than the concentration threshold (if any) specified in Table 6;
- incidentally manufactured, processed or otherwise used (a by-product), at any concentration, and released on-site to the environment or disposed of on- or off-site;

- contained in tailings disposed of during the calendar year, at any concentration; and
- contained in waste rock that is not inert and that is disposed of during the calendar year, at any concentration.

Any release or disposal of an NPRI substance must be included in the quantity otherwise used. For example, the quantity of the NPRI substance contained in dust released to air from materials stored on site would be included, whether or not the material is used for a specific purpose at the facility. Another example is a spill of an NPRI substance to water or land during storage or handling.

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. Do not include quantities of substances more than once in manufacture, process or otherwise use calculations. For example, if a substance is processed and released, the release quantity does not need to be added to the process quantity.

Do not include quantities of a Part 1B substance contained in any of the sources that are excluded, as listed in Section 3.5.2, or from the activities listed in section 3.5.3.

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.

5.3.3 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 5.3.2), 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 for a Part 1B substance is met, 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 exceptions to this are quantities of the substance:

- contained in the materials listed in section 3.5.2; and
- that are manufactured processed or otherwise used in the activities listed in section 3.5.3.

5.3.4 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 the quantity manufactured, processed or otherwise used is not reported.

Any facility that is subject to the *Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations* must report releases, disposals, and transfers for recycling of hexavalent chromium (and its compounds), regardless of the number of employees and regardless of the 50 kg mass threshold and 0.1% concentration threshold. If the facility does not meet any other NPRI requirements, only a report for releases, disposals, or transfers of hexavalent chromium (and its compounds) is required

Note that even if on-site releases, disposals or off-site transfers for recycling are zero or below the mass or concentration thresholds, 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 and during combustion, or contained in tailings. There are 31 PAHs listed in Part 2 of the NPRI substance list.

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 Section 3.4.3) 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 the [Guidance for Wood Preservation Facilities Reporting to the NPRI](#) for more information.

Figure 7 illustrates the steps for determining if reports for Part 2 substances are required, and, if so, what information must be reported.

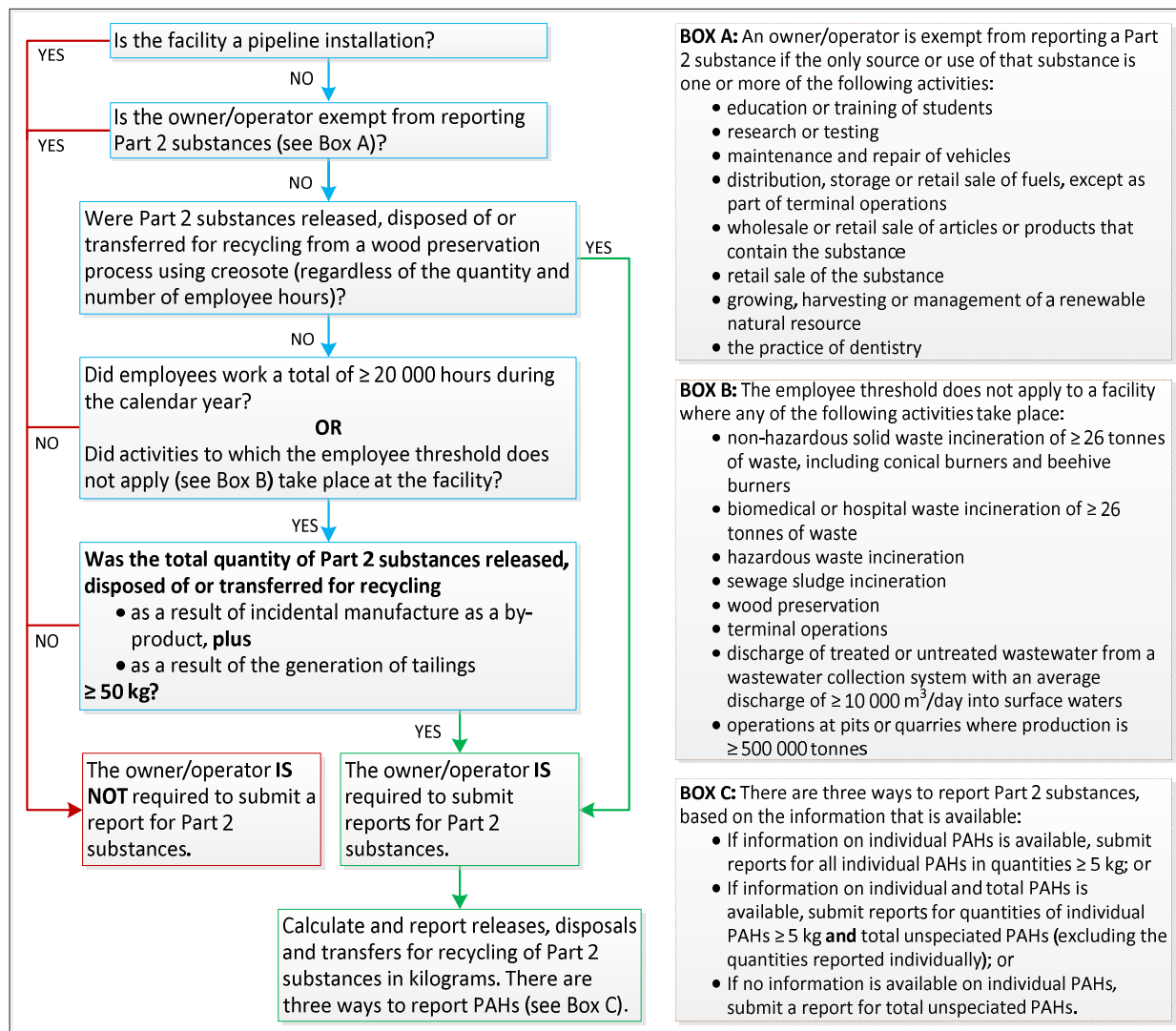
6.2 Calculating the reporting threshold for Part 2 substances

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

Do not include quantities of PAHs that are incidentally manufactured from activities listed in section 3.5.3. Do not include naphthalene (CAS RN 91-20-3) when determining the reporting threshold for

PAHs under Part 2. Although naphthalene is a PAH, it is a Part 1A substance and is therefore subject to Part 1A reporting requirements.

Figure 7 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.

If the 50 kg threshold is met, or if wood preservation using creosote takes place at the facility, a report must be submitted for PAHs. 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 31 PAHs.

Depending on the information that is available, there are three ways to report PAHs (also described in Box C of Figure 7 and Table 7):

- If information on releases, disposals and transfers for recycling for individual PAHs is available, those PAHs that are released, disposed of or transferred for recycling in quantities ≥ 5 kg must be reported individually.
- If only a combination of information on individual and total PAHs is available, quantities of individual PAHs in quantities ≥ 5 kg and quantities of “total unspiciated PAHs” should both be reported.
- If the only available information is for total PAHs, “total unspiciated PAHs” should be reported.

Note that “total unspiciated PAHs” is not intended to include the quantity of PAHs that are reported individually. In order to avoid double counting when reporting both individual PAHs and “total unspiciated PAHs”, the quantities of individual PAHs that are reported separately should not be included in the quantity reported for “total unspiciated PAHs”.

In addition, do not include release, disposal and transfer for recycling quantities of PAHs from activities listed in section 3.5.3 when reporting PAHs. Do not include release, disposal and transfer for recycling quantities of naphthalene (PAH listed in Part 1A) 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.

Table 7. How to report polycyclic aromatic hydrocarbons

Type of Information Available	Comparison to Thresholds	What to Report
Quantities of individual PAHs	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 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	Add quantities of total PAHs and any individual PAHs that are not already included in the total unspiciated 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 unspiciated PAHs” (not including quantities of individually reported PAHs) ▪ Quantities of individual PAHs that are < 5 kg are not required to be reported
Quantity of total PAHs	If total PAHs are ≥ 50 kg, reporting is required	<ul style="list-style-type: none"> ▪ Report “total unspiciated PAHs”



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

Polychlorinated dibenzo-*p*-dioxins (dioxins), polychlorinated dibenzofurans (furans) and hexachlorobenzene are released primarily as by-products of industrial and combustion processes; they are also found as contaminants in certain pesticides or chlorinated solvents. Hexachlorobenzene may also be found as a contaminant in the wood preservative pentachlorophenol (PCP).

Hexachlorobenzene and 17 dioxin and furan congeners are listed in Part 3. For a list of these congeners, see Table 11.

7.1 Reporting criteria for Part 3 substances

Reporting for dioxins, furans and hexachlorobenzene is mandatory for a **contiguous facility, a portable facility or an offshore installation** where the activities specified in Table 8 take place, regardless of quantity or concentration. The employee threshold applies to some of these activities, but does not apply to others, as indicated in Table 8. 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 hexachlorobenzene is mandatory, regardless of the number of hours worked by employees.

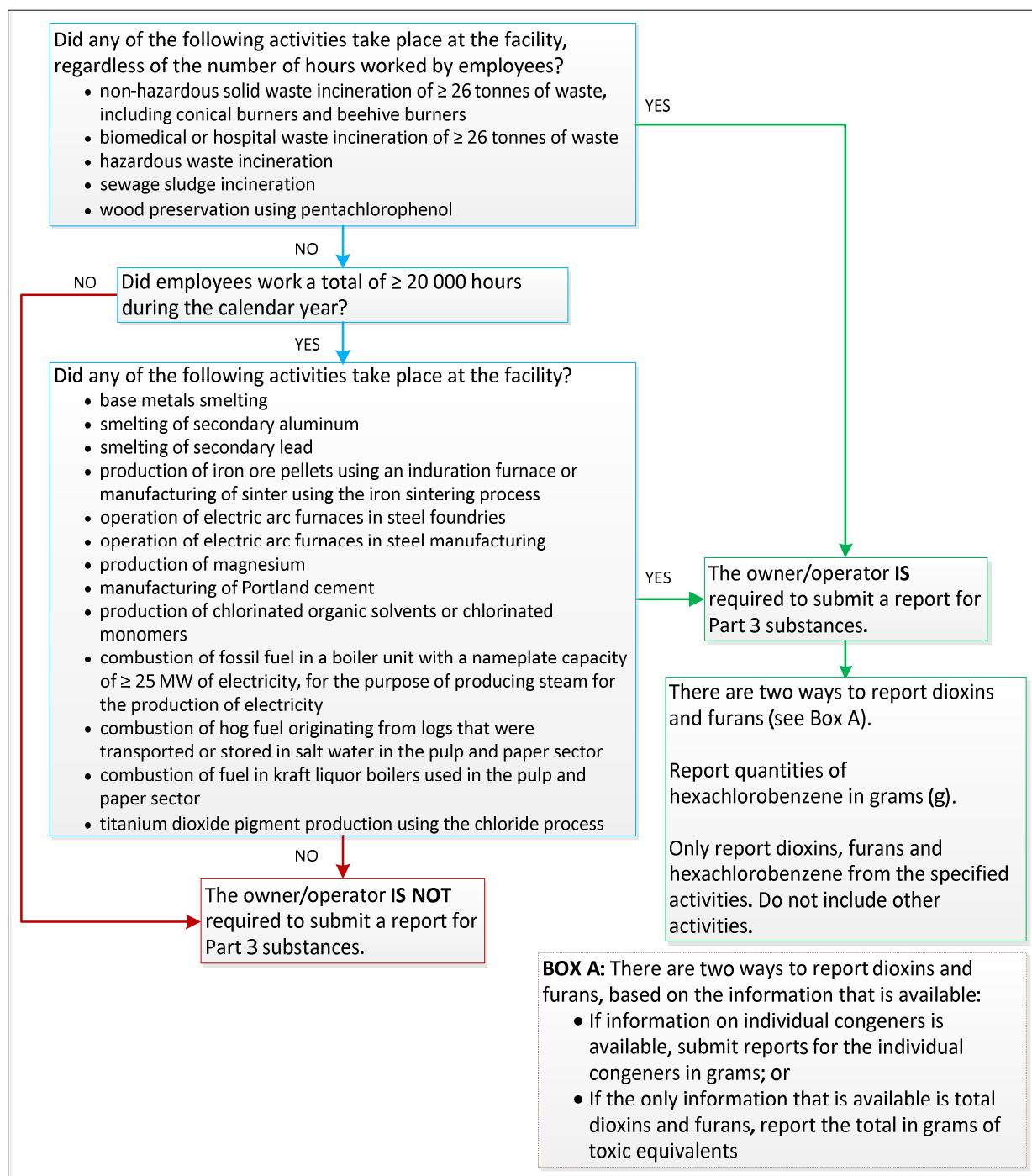
The employee threshold does not apply to wood preservation activities in general. However, only wood preservation using PCP triggers mandatory reporting of Part 3 substances. PCP, by its chemical structure, is a close surrogate to hexachlorobenzene. PCP is derived from hexachlorobenzene by substituting 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.

Figure 8 illustrates the steps for determining if a report for Part 3 substances is required, and, if so, what information must be reported.

Table 8. 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
	Production of iron ore pellets using an induration furnace or manufacturing of sinter using the iron 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 8. Reporting for Part 3 substances



7.2 Reporting releases, disposals and transfers for recycling of Part 3 substances

Only those quantities of dioxins, furans and hexachlorobenzene that result from the activities listed in Table 8 need to be reported. Quantities of Part 3 substances that result from other activities do not need to be reported.

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 what is required to be reported, the quantities determined using CEMS, PEM or source testing must be compared to the level of quantification (LoQ). LoQ is defined in CEPA as “the lowest concentration that can be accurately measured using sensitive but routine sampling and analytical methods.” Table 9 lists estimated LoQs for dioxins, furans and HCB, determined by Environment and Climate Change Canada for gases, liquids and solids.

Table 9. 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) toxicity 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 toxicity 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 LoQ for each type of release, disposal and 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 10 summarizes the information that should be reported for Part 3 substances, depending on the method of estimation and the comparison to the LoQ. Figure 9 illustrates the steps for determining the information that should be reported for Part 3 substances.

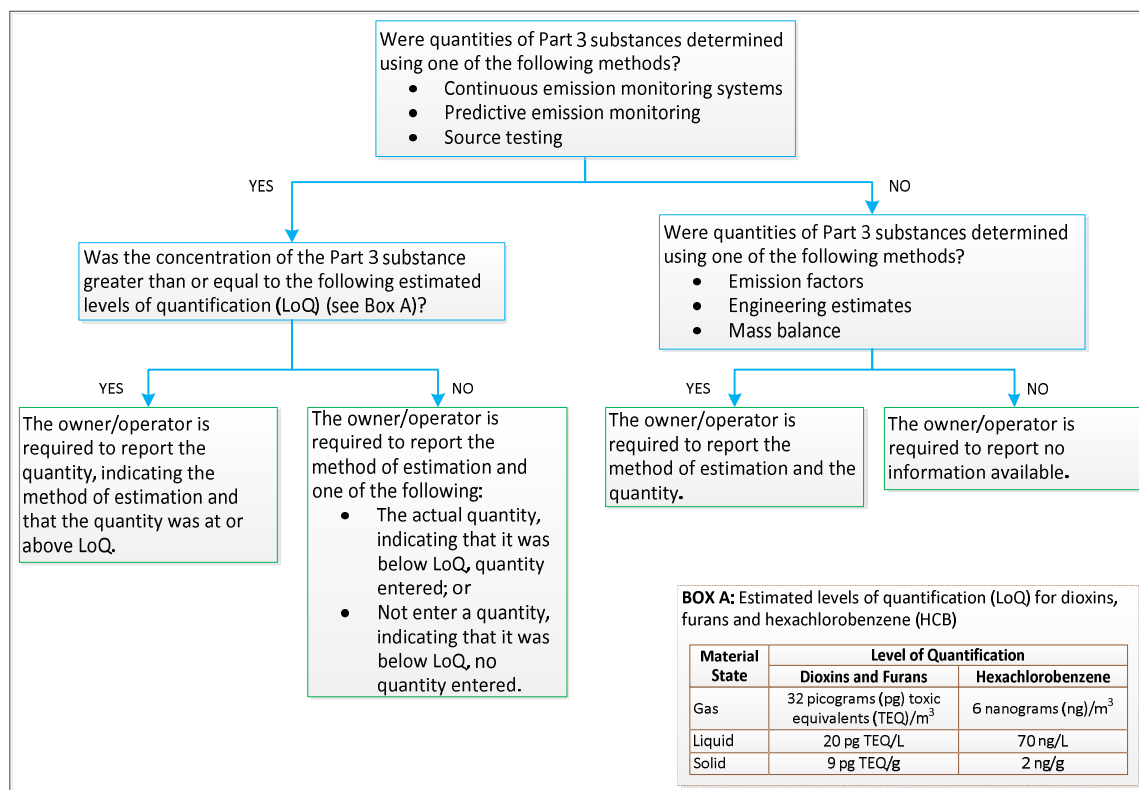
Table 10. How to report dioxins, furans and hexachlorobenzene

Method of Estimation	Comparison to Level of Quantification	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 Select “Toggle In-Context Help” under the Help menu in the online reporting system 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 the online reporting system, for Part 3 substances only.

Figure 9. How to report dioxins, furans and hexachlorobenzene



7.2.1 Reporting dioxins and furans as individual congeners or toxic equivalents

Depending on the information that is available, there are two ways to report dioxins and furans (also described in Box A of Figure 8):

- Information on individual congeners of dioxins and furans must be reported if it is available, in grams; or
- If the only information available is for total dioxins and furans, the total must be reported in grams of 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 11 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 11 Toxicity equivalent weighting factors for dioxins and furans

Congener	Abbreviation	CAS RN	Toxicity Equivalent Factor
2,3,7,8-Tetrachlorodibenzo- <i>p</i> -dioxin	2,3,7,8-TCDD	1746-01-6	1
1,2,3,7,8-Pentachlorodibenzo- <i>p</i> -dioxin	1,2,3,7,8-PeCDD	40321-76-4	1
1,2,3,4,7,8-Hexachlorodibenzo- <i>p</i> -dioxin	1,2,3,4,7,8-HxCDD	39227-28-6	0.1
1,2,3,6,7,8-Hexachlorodibenzo- <i>p</i> -dioxin	1,2,3,6,7,8-HxCDD	57653-85-7	0.1
1,2,3,7,8,9-Hexachlorodibenzo- <i>p</i> -dioxin	1,2,3,7,8,9-HxCDD	19408-74-3	0.1
1,2,3,4,6,7,8-Heptachlorodibenzo- <i>p</i> -dioxin	1,2,3,4,6,7,8-HpCDD	35822-46-9	0.01
Octachlorodibenzo- <i>p</i> -dioxin	OCDD	3268-87-9	0.0003
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	0.3
1,2,3,7,8-Pentachlorodibenzofuran	1,2,3,7,8-PeCDF	57117-41-6	0.03
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	0.0003

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



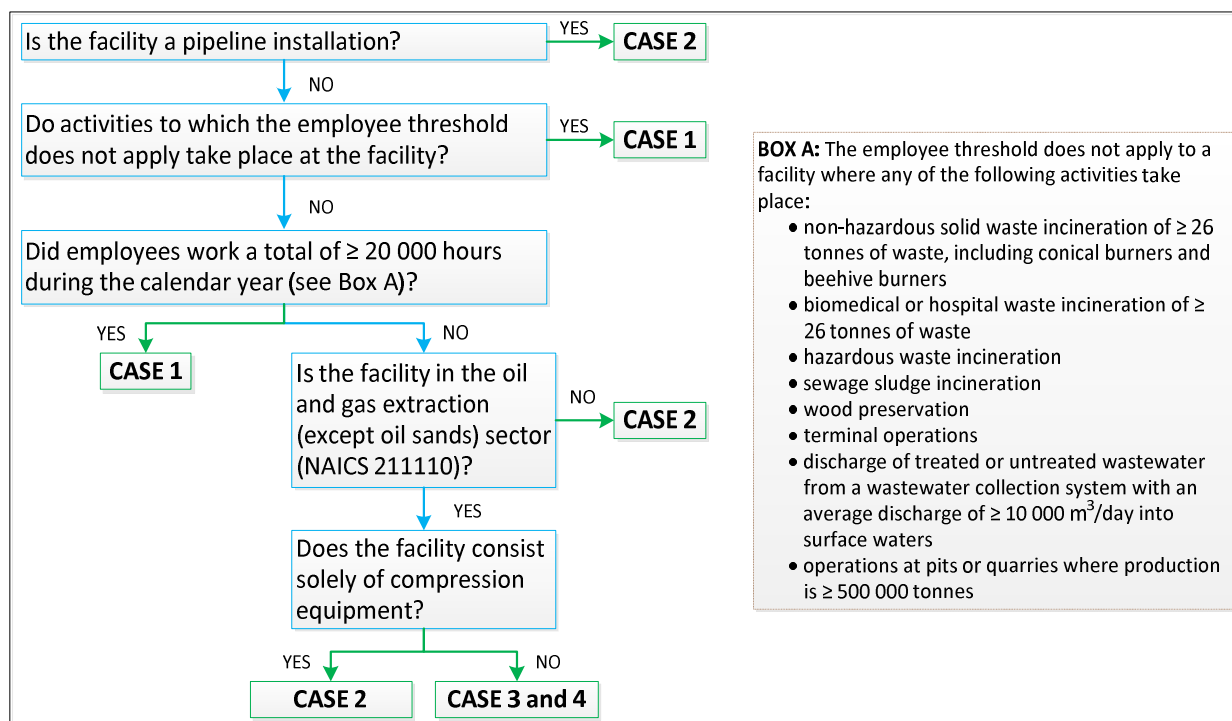
8. Reporting for Part 4 Substances – Criteria Air Contaminants

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 12).

The criteria for reporting Part 4 substances and the information to be reported vary depending on the number of employees and the activities that take place at the facility. Facilities can belong to one of the four categories, or “cases” shown in Figure 10. Case 1 and 2 facilities can be classified under any NAICS code and the criteria for reporting for these facilities are described below.

Case 3 and Case 4 facilities are facilities in the oil and gas extraction (except oil sands) sector (NAICS 211110) and do not meet the employee threshold. Requirements for Case 3 and 4 facilities are not described further in this Guide. For more information on the reporting requirements for oil and gas facilities, see the [Oil and gas industry: guide to reporting](#).

Figure 10. Determining which case applies for reporting Part 4 substances



8.1 Reporting criteria for Part 4 substances for Case 1 and 2 facilities

In contrast to the majority of NPRI substances, the thresholds for CAC emissions are based on the quantity released to air. In general, any person who owns or operates **a contiguous facility, a portable facility, a pipeline installation or an offshore installation** must submit a report to the NPRI for a Part 4 substance if the total quantity of the Part 4 substance released to air is greater than or equal to the release threshold specified in Table 12 and the following criteria are met:

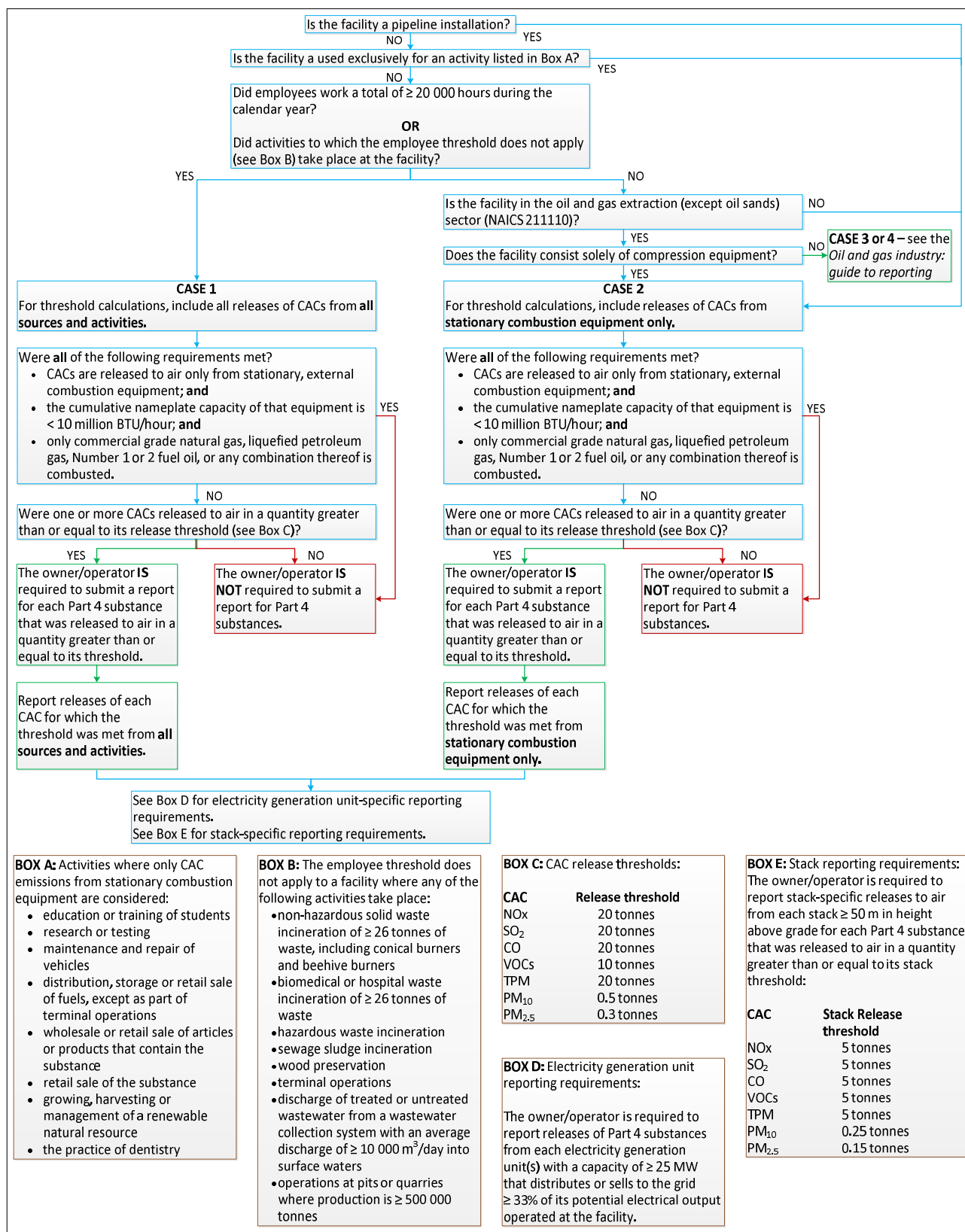
- employees work a total of $\geq 20\,000$ hours (Case 1 facilities); or
- activities to which the employee threshold does not apply (see Section 3.4.3) take place at the facility (Case 1 facilities);
- employees work a total of $< 20\,000$ hours and
 - stationary combustion equipment is operated at the facility (Case 2 facilities) and/or
 - the facility is in the oil and gas extraction (except oil sands) sector (NAICS 211110) and consists solely of compression equipment (Case 2 facilities); or
- the facility is a pipeline installation where stationary combustion equipment is operated (see section 3.4.2 for the definition of a pipeline installation) (Case 2 facilities).

Table 12. 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	
Volatile organic compounds	10
Particulate matter ≤ 10 micrometres (PM_{10})	0.5
Particulate matter ≤ 2.5 micrometres ($PM_{2.5}$)	0.3

Figure 11 illustrates the steps for determining if a report for Part 4 substances is required for Case 1 and 2 facilities, 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](#) and the [Supplementary Guide for Reporting Criteria Air Contaminants \(CACs\) to the National Pollutant Release Inventory](#).

Figure 11. Reporting for Part 4 substances



8.2 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 (NO₂). Since NO_x is a mixture, both NO and NO₂ must be expressed on an NO₂-equivalent basis before the individual quantities are combined for the total NO_x release. Do not include nitrous oxide (N₂O) when calculating NO_x releases.

Sulphur dioxide

Sulphur dioxide (SO₂) is part of the sulphur oxide (SO_x) family of gases. However, reporting to the NPRI is only required for SO₂, not SO_x. Therefore, the quantity of the other gases in the SO_x family, (i.e., sulphite, sulphur trioxide [SO₃] and sulphate [SO₄]) released should not be considered when calculating SO₂ releases.

Particulate matter

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

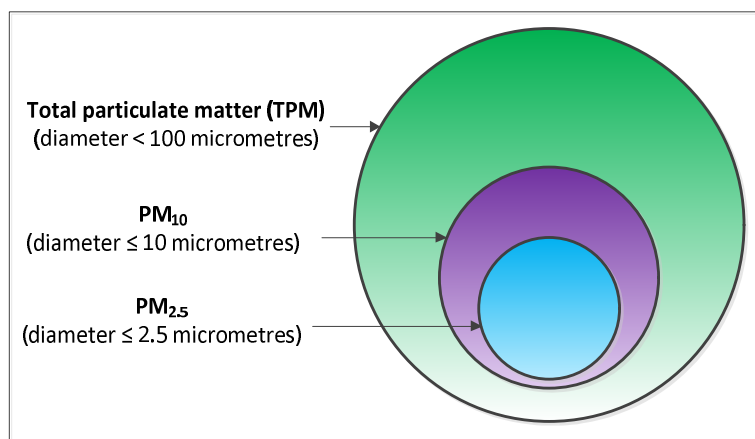
- total PM with a diameter less than 100 micrometres (TPM)
- PM with a diameter less than or equal to 10 micrometres (PM₁₀)
- PM with a diameter less than or equal to 2.5 micrometres (PM_{2.5})

As shown in Figure 12, the TPM fraction includes PM₁₀ and PM_{2.5}, while PM₁₀ includes PM_{2.5}. It is therefore impossible for PM_{2.5} or PM₁₀ releases to exceed TPM releases. It is also impossible for PM_{2.5} releases to exceed PM₁₀ releases.

TPM, PM₁₀ and 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. If the best available estimation method includes both filterable and condensable PM, and it is not possible to determine how much of the quantity is condensable PM to remove from the total, then the total can be reported with a comment to indicate that the quantity includes condensable PM.

TPM, PM₁₀ 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 $\geq 10\,000$ vehicle kilometres travelled per year.

Figure 12. Particulate matter size fractions



Volatile organic compounds

Volatile organic compounds (VOCs) are an aggregate grouping of more than 1 000 organic substances that readily volatilize and undergo photochemical reactions in the atmosphere.

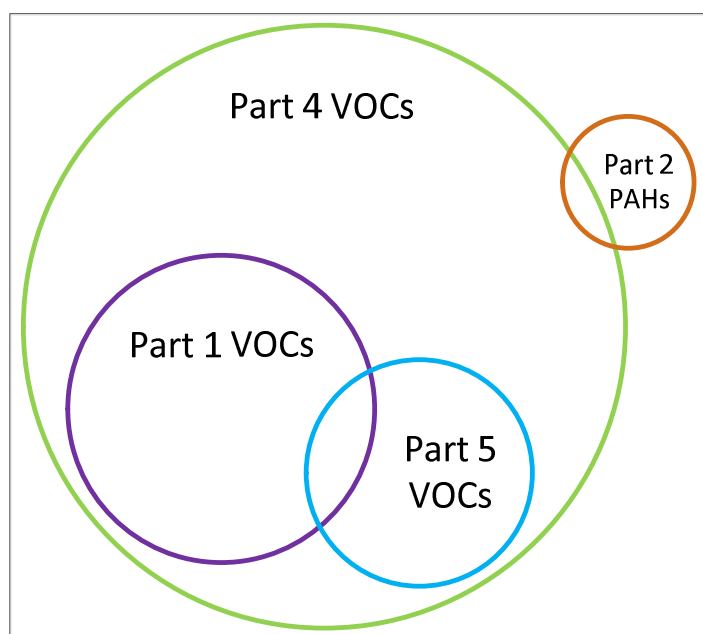
VOCs should be reported as the total quantity of VOCs that participate in atmospheric photochemical reactions. The NPRI definition of VOCs matches the definition of VOCs in section 65 of the List of Toxic Substances in Schedule 1 of CEPA. Do not include any of the [substances that are specified in Schedule 1 as being excluded from the VOC definition](#). 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.

VOCs are listed in Parts 1, 2, 4 and 5 of the NPRI, as illustrated in Figure 13. When reporting VOCs, it is important to note the following:

- Base the VOC emissions on the total mass of all VOC substances emitted annually.
- A number of VOCs are listed individually in Part 1A. Individual reports must be submitted for each of these VOCs that meet the Part 1A criteria (based on quantities manufactured, processed or otherwise used). Regardless of whether the Part 1A criteria are met, any releases to air of these substances must also be included in threshold calculations for Part 4 VOCs, along with all other VOCs emitted.

- PAHs listed in Part 2 also meet the CEPA definition of a VOC, are included in the calculation for total Part 4 VOCs, and are subject to Part 2 reporting requirements.
- When calculating Part 4 total VOCs, include any substance that meets the CEPA definition of VOC, even if it is not listed separately in Part 1 or Part 5.
- 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). A number of VOCs are listed on both Part 1 and Part 5, and are subject to reporting requirements for both Parts.

Figure 13. VOCs are listed in Parts 1, 2, 4, and 5 of the NPRI substance list



8.3 Calculating releases of Part 4 substances

Case 1 facilities must include releases of CACs from all sources when determining if the air release threshold is met. Case 2 facilities are required to include only releases of CACs from stationary combustion equipment when determining if the air release threshold is met. Table 13 lists some of the most common sources of CAC emissions, with a brief description of each.

Possible exclusion from reporting CACs for Case 1 and 2 facilities

A facility is not required to submit a report for a CAC, if all the following criteria are met:

- the CAC is 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.

Table 13. 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.
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	Storage piles generate 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.

8.4 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.

Releases to air may also need to be reported separately for each stack ≥ 50 metres (m) above grade, if the stack-specific release threshold specified in Table 14 is met. The following information about each stack must also be reported: height above grade, equivalent diameter, average exit velocity, average exit temperature, latitude and longitude, and provincial identification number(s).

Table 14. 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	
Total particulate matter	
Volatile organic compounds	
Particulate matter ≤ 10 micrometres (PM ₁₀)	0.25
Particulate matter ≤ 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 that emitted 7 tonnes of NO_x. The following must be reported:

- 25 tonnes of NO_x must be 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 for the stack (NO_x has a stack release threshold of 5 tonnes).



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

Part 5 lists 62 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.”

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 **contiguous facility, a portable facility, a pipeline installation or an offshore installation** 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 quantity of the Part 5 substance released to air is ≥ 1 tonne.

Figure 10 describes the four categories of facilities, or “cases,” that determine which sources must be included in threshold calculations. Figure 14 illustrates the steps for determining if a report for Part 5 substances is required for Case 1 and 2 facilities, and, if so, what information must be reported.

Case 3 and Case 4 facilities are facilities in the oil and gas extraction (except oil sands) sector (NAICS 211110) that do not meet the employee threshold. For more information on the reporting requirements for oil and gas facilities, see the [Oil and gas industry: guide to reporting](#).

9.2 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 15, determine whether a report will be required for a given substance.

Analytically unresolved hydrocarbons (C_{10} to C_{16+}) are an agglomeration of volatile organic compounds in the C_{10} to C_{16+} range that could not be separated into individual components by the selected gas chromatography column.

Figure 14. Reporting for Part 5 substances

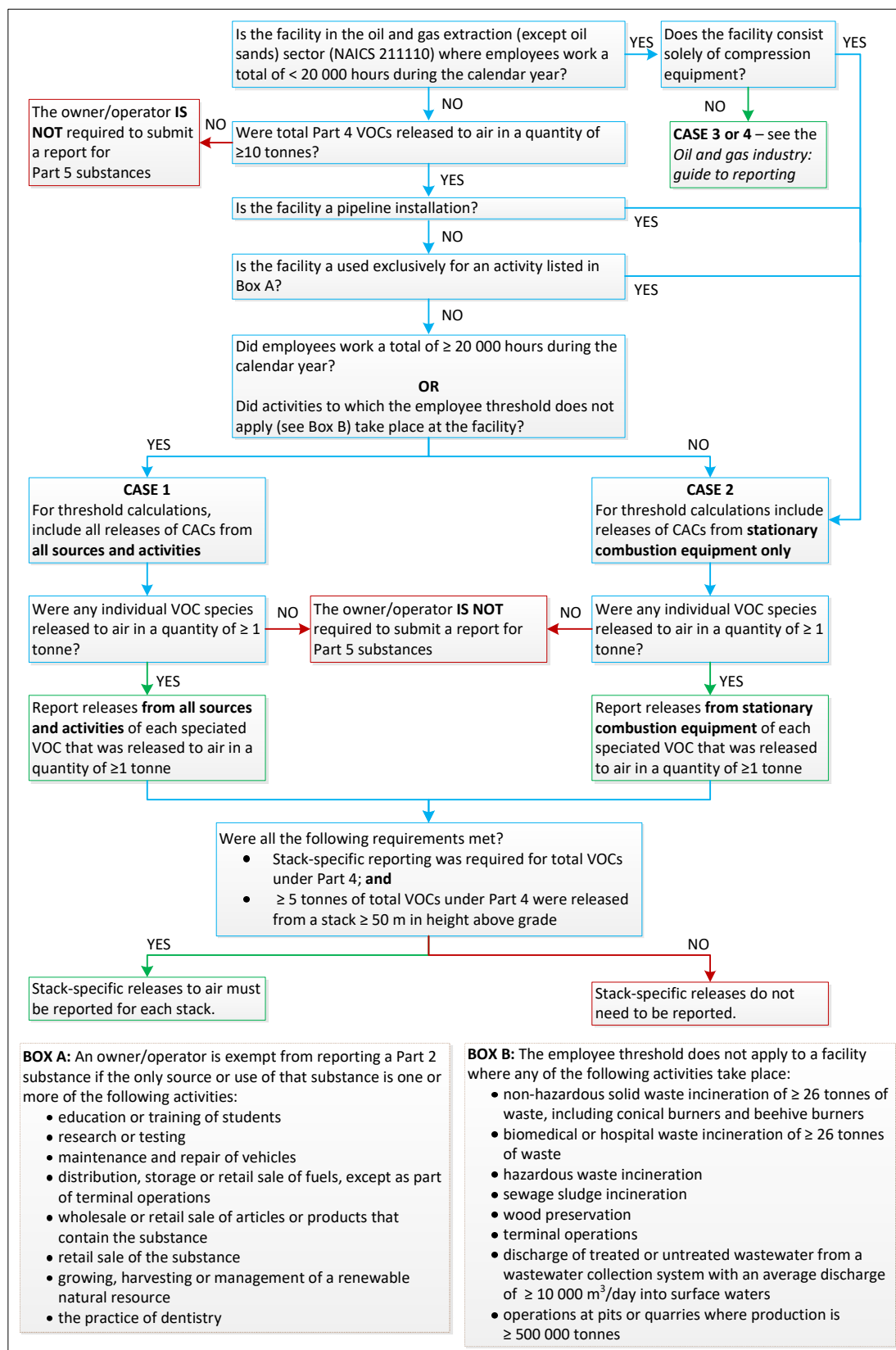


Table 15. Qualifiers for Part 5 substances

Substance Qualifier	Substance(s) to Which the Qualifier Applies	Description
all isomers	<ul style="list-style-type: none"> butane butene (25167-67-3) cycloheptane cyclohexene cyclooctane decane heptane hexene (25264-93-1) methylindan (27133-93-3) nonane octane pentane pentene propylene glycol methyl ether acetate (108-65-1) 	Total of all isomers reported as an aggregate of the individual isomers
	<ul style="list-style-type: none"> butyl acetate 	Total of <i>n</i> -butyl acetate (CAS RN 123-86-4), isobutyl acetate (CAS RN 110-19-0), and <i>sec</i> -butyl acetate (CAS RN 105-46-4). Excludes <i>tert</i> -butyl acetate (CAS RN 540-88-5)
	<ul style="list-style-type: none"> ethyltoluene 	Total of all isomers of ethyltoluene: 2-ethyltoluene (CAS RN 611-14-3), 3-ethyltoluene (CAS RN 620-14-4), and 4-ethyltoluene (CAS RN 622-96-8)
	<ul style="list-style-type: none"> hexane 	Total of all isomers reported as an aggregate of the individual isomers, excluding <i>n</i> -hexane (110-54-3)
	<ul style="list-style-type: none"> propyl acetate 	Total of all isomers of propyl acetate: isopropyl acetate (CAS RN 108-21-4) and propyl acetate (CAS RN 109-60-4)
	<ul style="list-style-type: none"> 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)
	<ul style="list-style-type: none"> xylene (1330-20-7) 	Total of all isomers of xylene: <i>m</i> -xylene (CAS RN 108-38-3), <i>o</i> -xylene (CAS RN 95-47-6) and <i>p</i> -xylene (CAS RN 106-42-3).
and their isomers	<ul style="list-style-type: none"> other glycol ethers and acetates 	Total of CAS RNs 112-07-2, 112-15-2, 112-25-4, 112-34-5, 5131-66-8, 107-98-2, 109-59-1, 111-90-0, 124-17-4, 1569-01-3, 1569-02-4, 2807-30-9, 29911-27-1, 29911-28-2, 34590-94-8, 54839-24-6, 623-84-7 and 88917-22-0, and their isomers

9.3 Calculating releases of Part 5 substances

Case 1 facilities must include releases of speciated VOCs from all sources when determining if the air release threshold is met. Case 2 facilities are required to include only releases of speciated VOCs from stationary combustion equipment when determining if the air release threshold is met.

9.4 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 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 separately 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 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 either as stack or point releases that are not assigned to a specific stack, or under one of the other release categories.



10. Glossary

10.1 Release, disposal, and recycling categories

On-site releases: a discharge of a substance to the environment within the physical boundaries of the facility. This includes releases to air, surface waters and land. Routine releases (e.g., fugitive releases) and accidental or non-routine releases (e.g., spills) are included. Releases do not include on-site or off-site disposals or off-site transfers for recycling.

Releases to air

- Stack or point releases: releases from stack or point sources including stacks, flares, vents, ducts, pipes or other confined process streams. Releases to air from pollution control equipment generally fall into this category.
- Storage or handling releases: releases to air from storage or handling of materials.
- Fugitive releases: releases that cannot be captured and releases that are unintentional, including
 - fugitive equipment leaks from valves, pump seals, flanges, compressors, sampling connections, open-ended lines, etc.
 - evaporative losses from surface impoundments and spills
 - releases from building ventilation systems
 - any other fugitive or non-point air emissions from land treatment, tailings, waste rock, storage piles, etc.
- Spills: accidental releases to air.
- Road dust: total particulate matter, PM₁₀ and PM_{2.5} releases from road dust must be reported if vehicles travelled more than 10 000 kilometres on unpaved roads at the facility.
- Other non-point releases: any other non-point releases to air that are not captured in the categories above.

Releases to surface waters

Releases to oceans, lakes, wetlands, rivers, streams, etc. are included.

- Direct discharges: releases that are directly discharged to surface waters from within the site boundaries. Discharges from onsite wastewater treatment systems and discharges to sewers that leave the facility and do not feed into an off-site wastewater treatment facility are considered to be releases to surface waters. Discharges to municipal or other off-site wastewater treatment facilities are reported as off-site transfers for treatment prior to final disposal.

- Spills: spills include any accidental releases to surface waters, normally occurring over a short period of time (hours or days).
- Leaks: leaks differ from spills in that they are chronic events, occurring over a comparatively long time (weeks, months, etc.).

Releases to land

Releases to land include surface and underground releases which occur at a facility.

- Spills: spills include any accidental releases to land, normally occurring over a short period of time (hours or days).
- Leaks: leaks differ from spills in that they are chronic events, occurring over a comparatively long time (days, months, etc.).
- Other releases to land that are not disposals: net quantities of other releases to land that are not spills or leaks and are not for the purposes of disposal. This category includes NPRI substances that are injected underground for purposes other than disposal (for example, solvents used to enhance in situ bitumen extraction). NPRI substances sent to landfill, used for land application, disposed of by underground injection, or transferred for treatment or storage are categorized as disposals (see the following sections for more information on disposals). Disposal quantities should be reported under the disposal category only, and not under releases to land, to avoid double-reporting.

Disposals: The final disposal to landfill, land application or underground injection, either on the facility site or at a location off the facility site; transfer to a location off the facility site for storage or treatment prior to final disposal; or movement into an area where tailings or waste rock are discarded or stored, and further managed to reduce or prevent releases to air, water or land, either on the facility site or at a location off the facility site. The disposal of a substance is different from a direct release to air, water or land.

On-site Disposals

- Landfill: total quantities of substances sent for final disposal to a designated landfill area located within the site boundaries.
- Land application: total quantities of substances sent for final disposal by application or incorporation into soil within the site boundaries.
- Underground injection: total quantities of substances disposed of by injection underground from within the site boundaries.

- Tailings and waste rock: 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 for final disposal.

- Landfill: total quantities of substances sent for final disposal to a designated landfill area located outside the site boundaries.
- Land application: total quantities of substances sent for final disposal by application or incorporation into soil outside the site boundaries.
- Underground injection: total quantities of substances sent for final disposal by injection underground from outside the site boundaries.
- Storage off-site prior to final disposal
- Tailings and waste rock: quantities of substances that are transferred to an off-site area where tailings or waste rock are discarded or stored and further managed to reduce or prevent releases.

Transfers: An NPRI-listed substance may be transferred to a location off the facility site for treatment prior to final disposal or for recycling and energy recovery.

Off-site transfers for treatment prior to final disposal

- 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
- Treatment in a municipal sewage treatment plant

Off-site transfers 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. Recyclable materials may be cleaned, regenerated or reprocessed to their original specifications and reused for their original purpose. They may also be used for an entirely different purpose without any pre-treatment or modification. Components may be recovered or reclaimed from the recyclable material or

the material may be used as a fuel for energy recovery. The recyclable material may be used in the manufacture of another product.

For the purposes of the NPRI, recycling also includes substances sent back to a manufacturer, supplier or recycler for reprocessing, repackaging, resale or for credit or payment. For example, metal shavings or turnings that are sold to a recycler are considered to be transfers off-site for recycling. The categories of recycling listed in the NPRI are:

- 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

10.2 Activities to which the employee threshold does not apply

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 are used as fuel to fire a boiler, these activities are not considered energy-from-waste incinerators.

Biomedical or hospital waste incineration

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 the [Canadian Council of Ministers of the Environment hazardous waste guidelines](#).

Hazardous waste incineration

Hazardous waste includes wastes that are potentially hazardous to human health 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](#) as well as wastes and materials specifically listed in the Schedules of the [Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations](#). This includes hazardous waste incinerated in a mobile incinerator temporarily located at a facility.

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.

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.

Pit: 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. Pits and quarries are only required to report if annual production is 500 000 tonnes or more. An open-pit mine that is operated for the purpose of extracting ore, bitumen, coal or other materials not listed above is not included in the definition of a pit or quarry, and the 500 000 tonne production threshold does not apply to these facilities. For more information, consult the [Pits and Quarries Reporting Guide](#).

Quarry: 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. Pits and quarries are only required to report if annual production is 500 000 tonnes or more. For more information, consult the [Pits and Quarries Reporting Guide](#).

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 collection 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). A wastewater collection system that discharges treated or untreated wastewater to surface waters is required to report if the annual average discharge rate is 10,000 cubic metres or more per day. Note that this discharge rate threshold does not apply to industrial wastewater treatment facilities. For more information, consult the [NPRI Guidance Manual for the Wastewater Sector](#).

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](#).

10.3 Activities that trigger reporting of Part 3 substances (dioxins, furans and hexachlorobenzene), if the employee threshold is met

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. For the purposes of reporting to the NPRI, 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 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.

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.

Production of iron ore pellets using an induration furnace or manufacturing of sinter using the iron sintering process: Sintering consists in agglomerating a fine fraction of iron-rich mill secondary materials and iron ore concentrate 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. Pelletizing consists of agglomerating ultra-fine particles of iron ore concentrate with a binder into marble-size pellets before high temperature hardening in specialized furnaces. In these induration furnaces, dioxins and furans may be formed as by-products during high-temperature decomposition or combustion of raw materials containing chlorine and organic compounds.

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.

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 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.

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

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.

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.

10.4 Other NPRI terms

Article: a manufactured item that does not result in a release or disposal of an NPRI substance when it undergoes processing or other use. When articles are processed or otherwise used, and there are no releases or disposals, or the releases are recycled with due care, the NPRI substances in that article do not need to be included in the threshold calculation.

Examples:

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 levelling 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.

By-product: the quantity of an NPRI Part 1 substance that is incidentally manufactured, processed or otherwise used at the facility at any concentration, and released to the environment or disposed of. The quantity of a substance that is recycled or that remains in the final product is not considered to be a by-product for the purpose of the NPRI threshold calculation. In general, if a quantity of a substance is intentionally manufactured, processed or otherwise used at a facility, then that quantity of the substance is not a by-product, even if it is unintentionally manufactured, processed or otherwise used at another step in the process. The quantity of a substance that is a by-product must be included in the calculation of the reporting threshold, regardless of concentration. The by-product requirements only apply to Part 1 substances and are only used for the purpose of determining whether or not the mass threshold for a substance has been met.

Examples:

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

Manganese and nickel are incidentally present in coal and are therefore by-products of the coal combustion process. 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, regardless of concentration.

Metal cuttings, sent for disposal, contain alloyed chromium and nickel at a concentration of less than 1%. The chromium and nickel are essential components of the alloy; therefore, they are not incidentally processed and are not considered to be by-products. Consequently, the chromium and nickel in the metal cuttings do not need to be included in the calculation of the reporting threshold, because the substances are present at a concentration less than the concentration threshold of 1%.

Contiguous facility: 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.

Due care: 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.

Dust: solid particles generated by any mechanical processing of materials including crushing, grinding, rapid impact, handling, detonation, and decrepitation of organic and inorganic materials such as rock, ore, and metal. Dusts do not tend to flocculate except under electrostatic forces.

Electricity generation unit: physically connected equipment that operates together to produce electricity for sale or distribution to the grid by means of thermal energy and is stationary when used, and is not in or on a machine that is self-propelled.

Fume: an airborne dispersion consisting of small solid particles created by condensation from the gaseous state, in distinction to a gas or vapor. Fumes arise from the heating of solids such as lead. The condensation is often accompanied by a chemical reaction, such as oxidation. Fumes flocculate and sometimes coalesce.

Inert waste rock: 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 $\geq 3:1$.

Manufacture: to produce, prepare or compound an NPRI substance. It also includes the incidental production of an NPRI substance as a by-product.

Example:

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.

Offshore installation: 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.

Other use or otherwise used: 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 (see sections 3.5.2 and 3.5.3).

Example:

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

Pipeline installation: 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 raw or processed natural gas. Pipeline installations are subject only to the reporting criteria for CACs (Part 4 substances) and speciated VOCs (Part 5 substances).

Potential electrical output: the quantity of electricity that would be generated by a unit in a calendar year if the unit were to operate at capacity at all times during that calendar year.

Portable facility: 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. The owner or operator of a portable facility will submit a report for the location where the facility operated for the longest period of time in the calendar year, using the total quantity of releases, disposals, or transfers from all operating locations. For all other locations where the portable facility operated during the year, the dates, addresses and geographic coordinates are to be submitted in the facility comments section in the online reporting system.

Process: 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:

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.

Tailings: 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.

Unconsolidated overburden: unconsolidated materials overlying the ore or bitumen deposit, including, but not limited to, soil, glacial deposits, sand and sediment.

Waste rock: 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.



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