

Guidance document for responding to the Questionnaire that forms part of the Challenge

The following document provides guidance for responding to the Challenge questionnaire. The questionnaire has been issued in order to provide organizations the opportunity to supply new information about how it is managing the 193 chemical substances that have been prioritized, due to their potential hazard to the environment or human health, following the categorization exercise. The hazard potential was determined based upon criteria that they may present to individuals in Canada, the greatest risk for exposure (GPE) or are “inherently toxic” to humans, and/or have properties of persistence, bioaccumulation and aquatic toxicity (PBiT). A need for action was identified as a result of the properties exhibited by these substances.

The purpose of the Challenge is to collect new information from stakeholders manufacturing, importing or using the substances, including information on the sectors using the substances, the use patterns, existing management practices, release and exposure pathways, potential substitution options, substance analysis methods and financial implication of elimination of the substances.

This information will then be used to identify industrial best practices, in order to set benchmarks for risk management and product stewardship.

Information for Completion of the Challenge Questionnaire

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1. How do I know if I am subject to the Challenge Questionnaire?

This Challenge is aimed at organizations that have manufactured, imported, exported, or used, whether alone, in a mixture or in a product, including manufactured items the substances as identified in the Challenge as announced in the December 9, 2006 Notice of Intent.

The full list of substances is available on the Government of Canada's chemical portal: <http://www.chemicalsubstanceschimiques.gc.ca>.

Definitions:

For the purpose of this questionnaire, the definitions are provided below.

“calendar year” means a period of 12 consecutive months commencing on January 1st.

“import” includes movement into Canada, including internal company transfers across the Canadian border, but does not include transit through Canada. “Import” then relates specifically to the movement into Canada of any of the substances or any mixture, product or manufactured item that contains such a reportable substance. Your activities do not meet the definition of “import” if you, your company or other body purchased or received the substance or a mixture, product or manufactured item containing the substance that was already located in Canada.

“manufacture” includes to produce or prepare a substance; and also includes the incidental production of a substance at any level of concentration as a result of the manufacturing, processing or other uses of other substances, mixtures, or products.

“manufactured item” means an item that is formed into a specific physical shape or design during manufacture and has, for its final use, a function or functions dependent in whole or in part on its shape or design, including clothing, empty storage containers, electrical gear and appliances or parts thereof, office and consumer electronics or parts thereof, tapes, tiles, electrical wire, fabric, fibres, empty containers, foam slabs or shapes and plastic film, pipes, tubes or profiles, plywood, brake linings, fibres, leather, paper, yarns, dyed fabric, matches, flares, photographic films, and batteries.

“mixture” means a combination of substances that does not produce a substance that is different from the substances that were combined, including a prepared formulation, hydrate, and reaction mixture that are fully characterized in terms of their constituents (e.g. paints, coating, solvent mixtures, azeotropic and zeotropic refrigerants, mixture that is under pressure and that is used for personal care, pharmaceutical, medical, household, laboratory, commercial or industrial.).

“release” - means the emission or discharge of a substance from the facility site to air, land, or surface water, including discharges to municipal wastewater treatment plants.

“transit” means the portion of an international transboundary movement through the territory of a country that is neither the country of origin nor the country of destination of the movement.

If your organization has **not** manufactured, imported, exported, or used, whether alone, in a mixture or in a product, including manufactured items, the substances (as published on the chemical portal <http://www.chemicalsubstanceschimiques.gc.ca>), then complete the facility information (sections 1.0 and 1.1) and the certification (section 10.0) and mail these to the address provided in question 6.

2. How do I respond if I have more than one facility?

Responses to the questionnaire should be submitted on an organization-wide basis. Individual facility data should be consolidated into one questionnaire and submitted on behalf of the entire organization. For each substance listed in the Challenge, that your organization manufactured, imported, exported, or used, whether alone, in a mixture, or in a product, including manufactured items, complete sections 2.0 through 9.0 separately and include data representing each of your organization's facilities. Each of the facilities submitting data to this questionnaire should be listed in section 1.1 along with the facility name, address, etc. The first column of section 1.1 provides a Facility ID letter that will correspond to the (facility) information entered on that line. This Facility ID should be carried forward for the remaining questions in the questionnaire should be used for the questions asking for individual facility data. That is - the facility listed on the first line has been assigned Facility ID "A" and this facility should enter its data for the applicable sections on the lines for Facility ID "A" throughout the questionnaire.

3. How do I complete the questionnaire?

Start on the first page of the questionnaire, at section 1.0, and proceed to answer the questions in order, following the directions provided at each question. If the question is not applicable to your facility, it will direct you to the next appropriate sections to complete.

4. Information you may reasonably be expected to have access to.

You are requested to provide information that your organization possesses or to which you may reasonably be expected to have access. For example, when importing a substance, mixture or product, you may reasonably be expected to have access to the relevant Material Safety Data Sheet (MSDS). An MSDS is an important source of information on the composition of a purchased product. Note that the goal of the MSDS is to protect the health of the workers, not the environment. Therefore, an MSDS may not list all product ingredients that the Government is requesting information on. You can contact your supplier for more detailed information on product composition.

Also, a facility may reasonably be expected to have access to its parent organization's information regarding substances, mixtures or products.

Information regarding substance release, manufacture, import and export is being requested for the calendar year(s) for which your organization has data and information available. Financial data is being requested for a five year period (2002-2006).

5. Confidentiality Requests

The Government of Canada is predisposed to be open and transparent; however, if you wish to have sections of your data remain confidential you must complete section 10.0 for each substance, listing the section of data for which you are requesting confidentiality and providing justification for each section requested. Pursuant to section 313 of CEPA 1999, any person who provides information in response to the Questionnaire may submit, with the information, a written request that it be treated as confidential.

A request for confidentiality may be submitted for any information item provided on a particular substance in response to the Questionnaire. When requesting confidential treatment by Environment Canada of information provided under the Questionnaire, you must provide some

justification for your request. Justification may be provided, for example, based upon the following considerations:

- The information is confidential to your organization;
- Your organization has taken, and intends to continue to take, measures that are reasonable in the circumstances to maintain the confidentiality of the information;
- The information is not, and has not been, reasonably obtainable by third persons by use of legitimate means, except with the consent of your organization;
- The information is not available to the public;
- Disclosure of the information may reasonably be expected to cause substantial harm to the competitive position of your organization;
- Disclosure of the information may reasonably be expected to result in a material financial loss to your organization or a material financial gain to your organization's competitors.

Upon receipt of a request for confidentiality under section 313 of CEPA 1999, in relation to information submitted pursuant to the section 71 Questionnaire of CEPA 1999, the Minister of the Environment will not disclose that information, except in accordance with section 315, 316 or 317 of CEPA 1999.

6. What is the deadline for response and where do I send the completed questionnaire?

The Government of Canada will be moving forward with risk management activities six months after batch publication dates, based on the information received. Completed questionnaires should be sent to:

Environment Canada
DSL Surveys Coordinator
Place Vincent Massey, 20th Floor
351 Saint Joseph Boulevard
Gatineau, QC K1A 0H3

Email: DSL.surveyco@ec.gc.ca

7. Who do I contact if I have questions related to the Challenge questionnaire?

If you have an inquiry, please contact the DSL Surveys Coordinator at the following numbers or email address: 1-888-228-0530 / 819-956-9313 email: DSL.surveyco@ec.gc.ca

8. Section by section explanation of the information being requested in the questionnaire

The following tables provide detailed explanations for each of the questions being asked, in addition to definitions of the terms used in the questions. The table layout begins at section 1.0 and continues in order, corresponding to the questionnaire layout. If you are providing information in paper format, and do not have enough space to fully answer the question, please do not hesitate to attach further documentation or explanation for required sections as necessary.

In the following tables, the left hand column corresponds to the column names in the questionnaire.

Section 1.0 Information on the Person or Class of Persons Subject to the Challenge	
<i>The information requested in this section is to be completed by the parent organization for each substance the organization and its facilities has manufactured, imported or used, whether alone in a mixture or in a product, including manufactured items.</i>	
Name of the Organization Subject to the Challenge	Enter the organization name. If you own or operate more than one reporting facility, provide the parent organization information in section 1.0 and list all subsidiaries in section 1.1. If your parent organization is the only facility, complete section 1.0 and enter your organization information as Facility "A" in section 1.1.
Street Address of Facility, City, Province/Territory, Postal Code	Enter the street name and number and other identifiers such as suite number or building designation (for example, Building A). For rural addresses, where a street address is not available, enter the lot and concession numbers. Enter also city, town, village, district or township, the province or territory, and the postal code where the organization is located. Do not use a post office box or mailing address (if different from the street address) as the street address.
Member of Association(s)	If you are a member of an association (Chemical Association, etc) please provide the name. This information will help direct efforts if there are consultations on the management of the substance.
Number of years Organization has been in operation	Indicate the number of years the organization (not individual facility) has been in operation.
Business Size	The information is based on the number of full-time workers employed by the organization. The purpose of the question is to ascertain if any one business size dominates the industry. This could influence the choice, as well as the design of the risk management instrument. The question also has important implications for understanding the economic impact of regulations.
Contact Information	Enter the name, title, mailing address and telephone number (with area code) of the organization's contact. If available, enter the e-mail address and facsimile number (with the area code) also. It is recommended that the contact you provide be a representative who can be contacted by Environment Canada for clarification of information submitted in the questionnaire. This person should be familiar with and able to answer questions about the information provided.

Section 1.1 All facilities covered by this questionnaire	
<i>Indicate all facilities operated by the parent organization, submitting data on this questionnaire.</i>	
Facility ID	The Facility ID assigned in this column is to be used in the questionnaire when differentiating data for different facilities
Facility Name	Enter the name of the facility. If your parent organization is the only facility, then re-enter your facility name on the line for Facility "A" .
Facility Lat/Long	Provide the Latitude and Longitude coordinates for each facility listed.
NPRI # (National Pollutant Release Inventory Identification Number)	Facilities that submit a National Pollutant Release Inventory (NPRI) report are assigned a permanent NPRI ID. If this facility has an NPRI ID number, enter it here. The NPRI ID is specific to the facility and does not change, even if the ownership of the facility has changed. If you do not have an NPRI ID number, leave this field blank.

NAICS Code (North American Industry Classification System)	Enter the six-digit NAICS code for this facility. Statistics Canada provides complete details of NAICS Canada on its website at http://www.statcan.ca/english/Subjects/Standard/naics/2002/naics02-menu.htm .
Business Registration #	This information is requested in order to obtain exact legal titles of facilities, if required during the implementation of risk management strategies.

Section 2.0 Substance

The information provided in this section identifies the Challenge substance and the calendar year you are reporting on. Sections 2.0 through 9.0 should be completed (as applicable) for each substance selected. A full list of Challenge substances can be found on the chemical portal: <http://www.chemicalsubstanceschimiques.gc.ca>.

Substance Name for which information is being provided	Enter the chemical name of substance as listed in the Challenge.
CAS No	Enter the Chemical Abstract Services Number (CAS#) for the substance as listed in the Challenge.
Commercial Name of Substance or product containing the Substance for which information is being provided	Provide the commercial or trade name of the substance or product containing the substance.
Calendar Year	Indicate the calendar year for which your organization has data and information on this substance and is submitting to the Challenge.

Section 3.0 Submission of Data to Other Sources or for Other Purpose

The information provided in this section will allow the Government of Canada to determine if there are programs that include these substances that may facilitate benchmarking of the substance use and release.

If yes, provide name of program	If you report releases to another program list the programs here. Examples include: NPRI, a survey (section 71 under CEPA, 1999), provincial permitting programs, point of impingement limits, NERM (National Emissions Reduction Masterplan).
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Section 4.0 Management Stewardship Information

The information provided in this section will help the Government of Canada understand the current risk management regimes already in place and the potential for duplication of regulatory burden. Information on programs and practices already in place would inform the instrument choice process. Alternatively, if industry can demonstrate that the substance is being managed effectively; this will guide the need for government action.

Current Programs, Practices, Technologies, etc	<p>Check off all that are currently in place in your facility.</p> <p>Occupational H&S – An illness, injury and accident prevention initiative within an organization, as directed under Part II of the <i>Canada Labour Code</i>, with specific requirements outlining employee, employer duties and responsibilities, legislation, rights, and codes.</p> <p>Emergency Plans –The details section for emergency plans should stipulate the controls in place to manage the exposure of substances to workers, the general population and the environment. Some companies may already have existing emergency plans at their sites. However, the Environmental Emergency Regulations require four components to an environmental emergency plan. The plan must address the prevention of, preparedness for, response to and recovery from an environmental emergency in respect of a substance.</p>
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	<p>ISO Certification – Certification of international standards (International Organization for Standardization) for quality management, environmental management, auditing management and quality assurance.</p> <p>Environmental Management System – An organization’s management system used to develop and implement its environmental policy and manage its environmental aspects. An EMS is part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy.</p> <p>Code of Practice/ guidelines – Rules established by regulatory bodies or trade associations, which are intended as a guide for acceptable practices in the industry.</p> <p>Process Safety Management – The application of management principles and systems to the identification, understanding and control of process hazards to prevent process-related injuries and accidents. The process safety management system suggested by the Canadian Society for Chemical Engineering (CSCHE) consists of 12 main elements - http://psm.chemeng.ca/help_guide_e.htm.</p> <p>Best Management Practices – Methods or practices that have been determined to be the most effective, practical means of preventing or reducing pollution from non-point sources.</p> <p>Best Available Technology – The best economically achievable technology that reduces negative impacts on the environment.</p>
Details (all)	If the program or practices etc apply to the substance identified in section 2.0, provide additional details including but not limited to: name of regulations or permits, voluntary industry practices or program, environmental management (treatment) system, code of practice, etc.

Section 4.1 Potential Action(s)	
<p><i>The information in this section provides an indication of the feasibility of various risk management approaches while also highlighting possible challenges for the substance’s effective management. The details provided on the programs and practices may enable the Government of Canada to project a substitution strategy, control measures, or the virtual elimination of the substance. For example, if there is a management decision to phase-out the substance in question, information on the status of a substitute (e.g. Research & Development, testing, registration of substitute) would indicate how long before the objective could be achieved.</i></p>	
Action(s) currently implemented	<p>Select all Programs, Practices, Technologies or Controls already in place in your facility.</p> <p>Phase Out of Substance – Gradually reducing the substance until it is no longer in use.</p> <p>Substance Replacement / Substitution – Replacing substances or materials used in a process or a product with non-toxic or less toxic substances, materials and feedstock (for example, using aqueous-based cleaners rather than solvent-based cleaners; using a non-toxic detergent to clean glassware rather than chromic acid).</p> <p>Product design or reformulation – Reducing or eliminating the use of the substance by changing product specifications or modifying the design or composition of products.</p>

	<p>Equipment or process modifications – Introducing new technologies or approaches to existing operating systems, processes and practices to improve production efficiencies and reduce or eliminate the substance use (for example, changing to mechanical stripping/cleaning devices from solvents; using more efficient spray-paint systems; instituting re-circulation within a process).</p> <p>Spill and leak prevention or Containment – Using measures to prevent accidental and chronic releases such as leaks of a substance (for example, installing splash guards and drip trays around equipment, such as solvent sinks, hot tanks and jet-spray washers, to collect and return drainage and contain leaks and spills).</p> <p>On-site reuse, recycling or recovery – Reusing, recycling and/or recovering the substance within the property boundaries of where an activity has taken place (for example, using a small distillation unit to reclaim solvents; recovering metals by ion exchange or reverse osmosis).</p> <p>Inventory management or purchasing techniques – Integration of environmental considerations into inventory management systems and into existing and new purchasing practices (for example, avoiding the unnecessary generation of waste by ensuring that materials do not stay in inventory beyond their shelf life; instituting a clearinghouse to exchange materials that would otherwise be discarded).</p> <p>Extended Producer Responsibility or Take Back Program – Environmental management approaches where the producers' physical and/or financial responsibility for a product is extended to the post-consumer stage of a product's life cycle. These initiatives can target all stages in the lifecycle of the products and packaging materials and may be voluntary, negotiated and/or regulated.</p> <p>Other – Any other methods that result in preventing or avoiding the use or release of this substance.</p>
How long to implement this action?	For each of the Program, Practice, Technology or Control options chosen in the previous column, indicate or estimate how long it would take to implement at your facility.
Details column	Provide details on what would be required to implement these things – such as name of the substance replacement, name of process change, equipment modification, reformulation, timeline for action on implementation, feasibility, issues, etc

Section 5.0 Import Manufacture or Use	
List of Customers	Provide a list of customers (at wholesale level only). If you supply to more than 20 customers, provide an indication of the customer or industry sector(s) or groups. This information is being requested to gain information on the chain of distribution of the substance.

Section 5.1.1 Import of the Substance	
<i>The information in this section will allow the Government of Canada to determine potential exposure pathways to humans and the environment.</i>	
Quantity of Substance	Provide a numerical value for the quantity of the substance imported in kilograms (kg).
Expected Use	Explain the functional use of the substance. Ex. flame retardants, additives, polymers, polymerization inhibitors, cross linking agents, surfactants, biocides, to be distributed to industry/consumers, used in formulation of another product etc.

Country of Origin	Indicate what country this substance was imported from. This information will allow Environment Canada to understand potential trade implications, and assess the quantity of the substance being imported as compared to domestic supplies.
Section 5.1.2 Import of the Substance in a Product	
Name of Product	Provide the name of the product containing the substance.
Quantity of Substance (kg)	Provide, in kilograms, the amount of the substance imported in a product.
Expected Use	Explain the functional use of the product. Ex. Colorants, pigments, stains, dyes, inks, pesticides, herbicides, biocides, disinfectants, repellents, attractants, etc.
Concentration of Substance in product OR Product Specification	Enter the concentration of the substance (with the metric units specified) imported in a product OR, if applicable, the product specification for the substance (ie minimum concentration, maximum allowable limit, etc.).
Analytical Method, MDL	Provide the analytical method and the method detection limit if the substance concentration (in the product) is measured. If the method used has been published, please provide the reference of this method. If the method used is an unpublished method, please provide phone numbers, email and website address of the authors and its organization. MDL (method detection limit) is the lowest concentration of a substance that can be measured and reported with 99% confidence and is determined from analysis of a sample in a given matrix containing the analyte.
Frequency of Analysis	Indicate how often the concentration analysis is conducted (ie yearly, with every shipment, etc.) and provide the last date of analysis.
Country of Origin	As explained in section 5.1.1.

Section 5.2.1 Manufacture - For Sale or Distribution of the Substance	
<i>The information provided in this section will allow the Government of Canada to understand where and how the substance is entering the Canadian market so that risk management can be properly targeted.</i>	
Name or type of chemical process used to mfr Substance	Provide the name of the chemical process or describe the process used to manufacture the substance. Alternative processes may exist or could be developed that are less harmful to the environment.
Quantity of Substance (kg)	Provide the amount of substance that is sold or distributed in kilograms. This question provides an order of magnitude of the substance which is a factor when considering management actions.
Expected Use	As explained in sections 5.1.1 and 5.1.2
Customer Industry Sector	List the industrial sector(s) or types of companies that the substance is sold or distributed to. Group products or product lines for consumer items.
Final Substance Specifications (Concentration)	Provide final substance specifications (ie percentage (%), concentration per weight, maximum or minimum concentration limits, etc).

Section 5.2.2 Manufacture - For Sale or Distribution as a Part of a Product	
Name of the manufactured item, mixture or product	Provide the name of the final product or the item line (ie lipstick, household cleaner, etc.) in which the substance is found.
Conc. of substance OR final specifications	Enter the concentration of the substance (with the metric units specified) sold or distributed in a product OR, if applicable, the product specification for the substance.

Analytical Method & MDL	As explained in section 5.1.2
Frequency of Analysis of Conc.	As explained in section 5.1.2
Name of Chemical Process Used to Manufacture Product	Provide the name of the chemical process or describe the process used to manufacture the product containing the substance. Alternative processes may exist or could be developed that are less harmful to the environment.
Price/Unit	Provide the mixture, manufactured item or product price per unit. Response could be in Canadian or US dollars per kilogram or tonne or average unit size (specify the unit size). For example, a mfr item containing the substance may be available in the market in three different sizes small (100 g for \$5); medium (150 g for \$6.50) and large (250 g for \$10). In this case, the average unit size and price would be 167 g for \$7. Pricing information combined with information on raw materials and substitute costs identifies the impact of risk management actions on costs as a percentage of the mfr item price. If the risk management costs are a significant percentage of the price, this could translate into price increases, and lead to impacts on Canadians and small and medium sized businesses.
HS Code	Harmonized Commodity and Description and Coding System (HS), provides information on component material, use and function, stage of fabrication, and to a certain extent, industrial origin. Statistics Canada provides a searchable database of HS Codes on its website at: http://www.statcan.ca/trade/scripts/trade_search.cgi . A list of HS Codes is available at: http://www.vassl.com/hscodet.htm .
Expected Use	As explained in section 5.1.2.

Section 5.2.3 Incidental Production of the Substance / By-product

Name of the By-product Containing the Substance	Provide the name of the by-product containing the substance. For incidental production of the substance, leave this column blank and complete the remainder of table.
Conc. of Substance in By-Product	Provide the concentration of the substance or by-product containing the substance (with the metric units specified) produced.
Analytical Method and MDL	As explained in section 5.1.2.
Frequency of Analysis of Conc.	As explained in section 5.1.2.
Name of Chemical Process Used to Mfr Substance as a by-product	Provide the name of the chemical process or describe the process that has manufactured (mfr) the substance as a by-product.
By-Product Price/Unit	As explained in section 5.2.2.
Quantity of Substance (kg)	Provide the amount of substance, in kilograms, that is produced incidentally or as a by-product.
Expected Use	Explain the expected use (if any) of the substance or by-product containing the substance. If the by-product is considered as “waste”, sections 6.0 to 8.0 should also be completed.

Section 5.2.4 Substance Cost Information

The information provided in this section will allow the Government of Canada to perform a trend analysis of total recurring costs to industry, and the contribution of the substance costs to total costs. Combined with substitution costs, this information enables estimation of the cost to industry as a result of risk management action.

Substance Recurring Cost /Year	The substance recurring costs is the cost per year incurred by industry for the substance identified in section 2.0. Costs could be in Canadian or US dollars. The unit of measurement should be specified. This information, when combined with substitute cost information, enables the calculation of recurring costs to industry resulting from the risk management action.
Total Recurring Cost / Year	Total recurring costs per year includes cost of materials and supplies, cost of fuel and electricity, and salaries and wages. This information enables estimation of the percentage contribution of substance costs to total recurring costs.
Section 5.3.1a Uses	
<i>The information provided in this section will allow the Government of Canada to understand the risks posed by the substance.</i>	
Process	<p>Indicate how the substance is used, more than one process may be selected. A definition for each process is provided below:</p> <p>Substance used as a reactant — Substance was used in chemical reactions for the manufacture or processing of another substance. This includes, but is not limited to, feedstock, raw materials, intermediates, catalysts and nutrients added to wastewater systems.</p> <p>Substance used as a physical or chemical processing aid — Substance was added to a mixture to aid in the manufacture or synthesis of another substance but was not intended to remain in or become a component of or ingredient in the product or product mixture. Examples include, but are not limited to, process solvents, catalysts, inhibitors, initiators, reaction terminators and buffers.</p> <p>Substance used as a manufacturing aid — Substance aided the manufacturing process but did not become a component of or ingredient in the resulting product and was not added to the mixture during the manufacture of a product or during synthesis of another substance. Examples include, but are not limited to, process lubricants, metal-working fluids, coolants, refrigerants and hydraulic fluids.</p> <p>Substance used as a formulation component — Substance was added to a product (or product mixture) before further distribution of the product. Examples of substances used in this capacity include, but are not limited to, additives, dyes, reaction diluents, initiators, solvents, inhibitors, emulsifiers, surfactants, lubricants, flame-retardants and rheological modifiers.</p> <p>Substance used as an article component — Substance became an integral component of an article distributed for industrial, trade or consumer use. An example is ethylene glycol added to vehicle radiators during assembly.</p> <p>Substance used for repackaging only — Substance or mixture containing the substance was processed or prepared for distribution in commerce. This also includes transferring the substance to and from bulk containers.</p> <p>Substance used for other use — Any use not covered in processes listed above</p>
Quantity of Substance (kg)	Provide, in kilograms, the amount of substance that is used in the process. This question provides an order of magnitude of the substance which is a factor when considering management actions.
Weight percent of Substance	Provide the percent by weight of the substance an element in a compound, or the percent by weight of the substance in a mixture. This information will provide the order of magnitude or whether the substance is an important component (as far as quantity) in a reaction or formulation.

Weight percent (or concentration) remaining in product after reaction	Provide the weight percent (or concentration) remaining in the mixture, manufactured item or product after the reaction. This will provide an indication of how much of the substance is un-reacted and therefore still available to be released to the environment
Name or use of final product.	Provide the name or use of the final product.
Section 5.3.1b	
Provide reaction and final end product	If the substance is consumed in a reaction, provide the reaction and final end product name.

Section 5.3.2 Substance Storage	
<i>The information requested in these questions relate to the potential for an organization to require an environmental emergency plan, and the potential for respiratory distress from a spill of the substance.</i>	
Largest Capacity container	Indicate, in kilograms, the capacity of the largest single container on site, containing the substance. Indicate the metric units (ie m ³ , tonne, etc.).
Maximum quantity on site/year	Indicate, in kilograms, the maximum expected quantity of the substance on site in a calendar year (with the metric units specified)
Storage temperature (°C)	Indicate, in degrees Celsius, the normal storage temperature of the substance.

Section 5.3.3 Use in Products	
Product Type or Name	Indicate the type of product (ie infant toy) or name of the product.
HS Code	As explained in section 5.2.2.

Section 5.4 Substitutes	
<i>The information provided in this table will be used to assess the substitutes that could potentially be used to replace the substance identified in section 2. Information on price, substitution ratios, and reformulation, re-registration and production/process changes helps identify the potential incremental costs that the industry could face from a risk management action.</i>	
Substitute Name	Provide the name (chemical or product name) of the substitute
CAS No.	Enter the Chemical Abstract Services Number of the substitute.
Price / Unit of Measure	As explained in 5.2.2.
Substitution Ratio	Substitution ratio should take into account technical characteristics imparted to products in which it is used as well as re-engineering or reformulation consideration,

Section 5.4.1 Barriers to Substance Substitution	
Outline the barriers to the elimination of this substance (ie no substitution exists, substitute is also toxic, etc.), provide estimate of cost, outline requirements for production changes, etc.	

Section 6.0 On-Site Releases	
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The Government of Canada is asking you to provide information on all of your facility's releases to the environment in addition to an estimation of the how this amount was determined / calculated. Whenever a release quantity is reported (in sections 6.0 through 8.0) a Method of Estimation code must be provided. The "Method of estimation" codes provide information about how you determined the quantity of a substance that was used, released, transferred or disposed. Explanations of the codes are provided below, and are listed in declining order of expected accuracy:

Method of Estimation Codes:

M1	Continuous Emission Monitoring System
M2	Predictive Emission Monitoring
M3	Source Testing
C	Mass Balance
E1	Site-specific and Published Emission Factors
E2	Emission Models
O	Engineering estimates

Section 6.1 Releases to Air

Note: Both routine releases, such as fugitive releases to air, and accidental or non-routine releases, such as a relief valve opening due to process upset, should be included in your estimate of the quantity released.

Type of Releases to Air	<p>Stack or point releases - Releases from stack or point sources, including stacks, vents, ducts, pipes or other confined streams. Releases to air from pollution control equipment generally fall into this category.</p> <p>Storage or handling releases - Releases to air from storage or handling of the Substance</p> <p>Fugitive releases - Releases to air that are not released through confined streams. These releases include:</p> <ul style="list-style-type: none"> • fugitive equipment leaks from valves, pump seals, flanges, compressors, sampling connections, open-ended lines, etc.; • releases from building ventilation systems; and • any other fugitive or non-point air emissions from land treatment, mine tailings, storage piles, etc. <p>Spills - Accidental releases of the substance that result in releases of the Substance to air that do not qualify as point or non-point air releases.</p> <p>Other non Point - Any other releases to air not estimated in one of the above air-related release types</p>
Facility ID	This column provides a letter which corresponds to the facility listed in section 1.1 beside the same letter.
Quantity (kg)	Provide, in kilograms, the amount of substance that is released to the air, in the appropriate row(s).
Method of estimation	<p>Indicate how each release quantity was determined by entering the code for the appropriate Method of Estimation. Definitions of each of the codes is provided below:</p> <p><u>M1 - Continuous Emission Monitoring Systems (CEMS)</u> Continuous Emission Monitoring Systems (CEMS) record emissions/releases over an extended and uninterrupted period. Various methods are employed to measure the concentration of contaminants in the effluent or gas stream. Once the contaminant concentration and the flow rate have been determined, release or emission rates can be calculated by multiplying the contaminant concentration by the discharge flow rate or volumetric stack gas flow rate. Annual releases of the contaminant can then be estimated by multiplying the contaminant concentration by the annual flow rate of the discharged effluent or gases in the stack or duct.</p> <p><u>M2 - Predictive Emission Monitoring (PEM)</u> Predictive Emission Monitoring (PEM) is based on developing a correlation between contaminant release/emission rates and process parameters (e.g., fuel usage, steam</p>

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 contaminant emission rates and process parameters. Releases/emissions can then be calculated or predicted using process parameters to predict release/emission rates based on the results of the initial source test.

M3 - Source Testing Source testing involves collecting a sample of the emission or effluent, then determining the concentration of one or more substances in the sample. The concentration of the substance(s) of interest is then multiplied by the volumetric flow rate to determine the amount of the substance(s) emitted over time. Source testing of air emissions generally involves inserting a sampling probe into the stack or duct to collect a volume of exhaust effluent isokinetically. The contaminants 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.

C - Mass Balance Mass balance applies the law of conservation of mass to a facility, process or piece of equipment. If there is no accumulation, then all the materials that go into the system must come out. Releases are determined from the difference in the input and output of a unit operation where the accumulation and depletion of a substance are included in the calculations.

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 loss from coating applications and solvent use. This method may not be suitable for many other sources, such as cases where chemical transformation of the input streams occurs in the process.

Mass balance methods may or may not account for emission controls, depending on the system, process or operation to which the mass balance is applied. Pollution-control equipment should be accounted for when mass balance calculations are performed.

E1 - Site-specific and Published Emission Factors Emission factors are available for many emission-source categories and are generally based on the results of source-sampling tests performed at one or more facilities within a specific industry. Generally, emission factors relate the quantity of substances emitted from a source to some common activity associated with those emissions. Government agencies and industry associations publish emission factors to be applied to emission sources in their particular jurisdiction or industrial sector. Industrial facilities may also develop their own site-specific emission factors using emission-testing data and source-activity information. For a particular piece of equipment, specified emission factors may be available from the manufacturer or sales centre. When completing the report, you must specify whether a site-specific emission factor or published emission factor was used.

The basic equations for determining emissions from emission factors are as follows:

$$E_x = BQ \times CEF_x \quad \text{OR} \quad E_x = BQ \times EF_x \times ((100 - CE_x)/100)$$

Where:

- E_x = Emission of contaminant x in kg
- BQ = Activity rate or base quantity (BQ), base quantity unit
- CEF_x = Controlled emission factors of contaminant x, kg/BQ unit (value is dependent on the external control device installed)
- EF_x = Uncontrolled emission factors of contaminant x, kg/BQ unit

CE_x = Overall emission control efficiency of contaminant x, %

The U.S. EPA Factor Information Retrieval (FIRE) database and *Compilation of Air Pollutant Emission Factors (AP-42)* are comprehensive depositories of process-specific emission factors. When making use of emission factors, ensure that you note the units and convert if necessary.

E2 - Emission Models Emission estimation models, also known as emission estimation tools, are equipment-specific and may be available from process developers and designers, Government agencies or others.

Emission models generally require detailed input such as equipment specifications, process and environmental conditions and other factors that affect emissions. Generally, these models also have default input parameters, such as meteorological data, which can be used when site-specific information is not available. Review all the default data carefully to ensure that they apply to local conditions. The resulting estimates should also be reviewed to ensure their accuracy. The U.S. EPA's TANKS software, used to estimate VOC releases from storage tanks, is an example of an emission model.

O - 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 judgment, 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-chemical properties. To apply an engineering assessment method, follow these four basic principles:

- Review all data pertaining to the specific source and to the industrial sector in general.
- Use this data to provide gross approximations and refine these using sound engineering principles as data become available to provide more accurate estimations.
- Whenever possible, alternate methods of calculation should be followed to cross-check each level of approximation.
- Employ good record keeping by documenting all related information for further emission refinement when more accurate data become available.

Routine Release	Indicate if the release is routine or not, as per the description in the Section 6.1 header bar.
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Section 6.2 Releases to Surface Waters

Note: Do not include discharges to a municipal sewage treatment plant or other off-site water treatment facility as these are covered in Section 7.3 Off-Site Transfers for Disposal.

Type of Releases to Surface Waters	<p>Direct discharges - Releases directly to a receiving body of water.</p> <p>Spills - Accidental releases to surface waters that may have occurred at the facility</p> <p>Leaks - Leaks to surface waters differ from spills in terms of the time required for an event. Spills normally occur over a period of hours or days, whereas a leak is a chronic event that occurs over periods of days or months.</p>
Facility ID	Each letter in this column corresponds to a facility that you have listed in section 1.1. The Facility ID indicates what line each individual facility data should be entered on.
Quantity (kg)	Provide, in kilograms, the amount of substance that is released to the surface waters, in the appropriate row(s).
Method of estimation	As explained in section 6.1.
Routine Release?	As explained in section 6.1.

Section 6.3 Releases to Land	
<i>Note: Do not include land disposal (i.e., landfill) at any off-site locations, as this is considered an off-site transfer for disposal.</i>	
Types of Releases to Land	<p>Landfill - Releases to land on-site (ie, on-site landfill).</p> <p>Land treatment - Releases to land by applying a waste onto, or incorporating a waste into soil.</p> <p>Spills - Accidental releases to land at the facility.</p> <p>Leaks - Leaks to land differ from spills in terms of the duration of the event. Spills often occur over a period of hours or days, whereas a leak is a chronic event that often occurs over a longer period of days or months. An example is a leak from an underground storage tank.</p> <p>Other - Any other releases to land not estimated in one of the above land-related release types (ie, encapsulation prior to on-site landfill).</p>
Facility ID	As explained in section 6.1.
Quantity (kg)	Provide, in kilograms, the amount of substance, which is released to land in the appropriate row(s).
Method of estimation	As explained in section 6.1.
Routine Release?	As explained in section 6.1.

Section 7.0 On-Site and Off-Site Waste Transfers and Disposals	
Section 7.1 On-Site Waste Disposal	
Types of On-Site Disposal	<p>Landfill – On-site disposal to land (ie, on-site landfill).</p> <p>Land Treatment – On-site disposal to land by applying a waste onto, or incorporating a waste into soil.</p> <p>Underground Injection – Underground injection on-site for disposal.</p> <p>Storage – Storage on-site for disposal.</p>
Facility ID	As explained in section 6.1.
Quantity (kg)	Provide, in kilograms, the amount of substance that is disposed of on-site, in the appropriate row(s).
Method of estimation	As explained in section 6.1.
Routine Release?	As explained in section 6.1.

Section 7.2 Off-Site Waste Disposal	
Types of On-Site Disposal	<p>Landfill - Off-site disposal to land (ie, off-site landfill).</p> <p>Land Treatment – Off-site disposal to land by applying a waste onto, or incorporating a waste into, soil.</p> <p>Underground Injection – Underground injection off-site for disposal.</p>

	Storage – Storage off-site for disposal.
Facility ID	As explained in section 6.1.
Quantity (kg)	Provide, in kilograms, the amount of substance that is disposed of off-site, in the applicable row(s).
Method of estimation	As explained in section 6.1.
Routine Release?	As explained in section 6.1.

Section 7.3 Off-Site Waste Transfers Prior to Final Disposal

Note: Report the quantity of the Substance that was sent off-site for disposal and not the total weight of the mixture containing the substance. Report transfers to the first off-site location only and not any subsequent transfers by the waste disposal organization or by any other entity. Do not include transfers sent off-site for recycling; they are reported in section 8.0 of the questionnaire.

Types of Off-Site Waste Transfers prior to Final Disposal	<p>Physical treatment - Examples include drying, evaporation, encapsulation and vitrification.</p> <p>Chemical treatment - Examples include precipitation, stabilization and neutralization.</p> <p>Biological treatment - Examples include bio-oxidation and composting.</p> <p>Incineration/thermal - This differs from energy recovery. Incineration occurs when the Substance or the mixture containing the Substance does not have sufficient fuel value to contribute towards energy recovery.</p> <p>Containment - For example, two forms of containment are:</p> <ul style="list-style-type: none"> ○ landfill; or ○ other storage <p>Municipal sewage treatment plant - Report releases of the Substance to a municipal sewer system, regardless of the level of treatment provided by the treatment plant.</p> <p>Underground injection - Report the quantity injected underground at an off-site location</p> <p>Land treatment - Report the quantity transferred off-site for the purpose of application onto or incorporation into soil.</p>
Facility ID	As explained in section 6.1.
Quantity (kg)	Provide, in kilograms, the amount of substance that is transferred off-site in waste in the appropriate row(s).
Method of estimation	As explained in section 6.1.
Routine Release?	As explained in section 6.1.

Section 8.0 Off-Site Transfers for Recycling

Note: Report the quantity of the substance that was sent off-site for recycling and not the total weight of the mixture containing the substance. Report transfers to the first off-site location only and not any subsequent transfers by the recycling facility or by any other entity.

	<p>Energy recovery - The substance or the mixture containing the substance has sufficient energy content (BTU value) to allow its use as a fuel for energy recovery. If there had been no attempt to recover energy from the substance or mixture containing the substance, report it as an off-site transfer for incineration.</p> <p>Recovery of solvents - The recovery or regeneration of the substance or materials containing the substance that have been used as solvents (for example, distillation of methanol after solvent extraction to recover pure solvent</p>
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	<p>methanol).</p> <p>Recovery of metals and metal compounds - Choose this recycling activity when a pure metal or a metal compound is being recovered.</p> <p>Recovery of organic Substances (except for solvents) - Recovery of other organic substances that are not used as solvents.</p> <p>Recovery of inorganic materials (except for metals) - Choose this recycling activity when inorganic material is being recovered.</p> <p>Recovery of acids or bases - Choose this recycling activity when acids or bases are being recovered.</p> <p>Recovery of catalysts - Choose this item if a catalyst containing the substance was transferred off-site to be recovered, reactivated, regenerated or otherwise refurbished for reuse as a catalyst. Recovery of catalysts does not include the destruction of the catalyst to recover separate components.</p> <p>Recovery of pollution abatement residues - This includes the recycling of residues from pollution control or site remediation activities.</p> <p>Refining or reuse of used oil - Choose this recycling activity if used oils containing the substance(s) were transferred off-site for refining or reuse. If used oil was used as a fuel, choose energy recovery.</p> <p>Other – Any other recovery, reuse and recycling activities not described above.</p>
Facility ID	As explained in section 6.1.
Quantity (kg)	Provide, in kilograms, the amount of substance that is transferred off-site for recycling, in the appropriate row(s).
Method of estimation	As explained in section 6.1.
Destination	Provide the name and /or location of the destination site for recycling.

Section 9.0 Off-Site Transfers for Export	
Types of Off-Site Transfers for Export	<p>Export for disposal – Export of the substance or product containing the substance for disposal (landfill, incineration, etc).</p> <p>Export for recycling –Export of the substance or product containing the substance for recycling.</p> <p>Export for use – Export of the substance or product containing the substance for use in another process, product, etc.</p>
Facility ID	As explained in section 6.1.
Quantity (kg)	Provide, in kilograms, the amount of substance that is transferred off-site for export in the appropriate row(s).
Method of estimation	As explained in section 6.1.
Destination	Provide the name / location of the destination site for recycling.

Section 10.0 Certification	
<i>The following section should be completed for each substance submitted by each organization.</i>	

Confidentiality Requests	Requests for confidentiality can be made in this section by specifying which section(s) you wish to remain confidential and providing the reason(s) for each request. Data cannot be made confidential without proper justification. See question 5 of this document for further guidance on submitting requests for confidentiality.
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