

# **Guide to calculations for ChemTRAC reporting:**

## **Dry cleaning facilities**

**Version 1.1**

**February 2013**

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## How do I use this guide?

**Part 1 of this guide will help you understand the ChemTRAC program, collect information about your facility, use the ChemTRAC calculator for dry cleaning facilities, and report to ChemTRAC, if needed.**

**Part 2 of this guide will help you reduce your facility's environmental impact.**

**The Appendices provide additional information about emissions calculations.**

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*City of Toronto, 2012*

*For more information about ChemTRAC, call 3-1-1 or visit [www.toronto.ca/chemtrac](http://www.toronto.ca/chemtrac)*

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**DISCLAIMER:** This guide is for educational and informational purposes only. The City of Toronto assumes no liability for the accuracy or completeness of these materials. Readers are responsible for ensuring compliance with Toronto's Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423). These materials should not be relied upon as a substitute for legal or professional advice. Readers should seek their own legal or professional advice in regard to their use of the information contained in the guide.

## Introduction to the ChemTRAC program

There are chemicals in Toronto's environment that can harm our health. These substances come from vehicle exhaust, homes, businesses and other sources.

Toronto Public Health identifies 25 of these chemicals as "priority substances" because they are found in our local environment at levels that are of concern for health. Evidence links these substances to short-term health effects such as respiratory problems, and longer-term impacts such as cancer. In a business setting, these substances can come from process heating, cleaning with solvents, welding and other processes.

The list of 25 substances and the reporting thresholds are included in Table 5 on page 56.

ChemTRAC is a City of Toronto program that:

- tracks where businesses use and release these priority substances
- helps businesses reduce or replace these substances with safer alternatives, and
- provides the public with information on priority substances in their community.

As part of ChemTRAC, Toronto's Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423) requires many businesses to report to the City each year if they use or release a certain amount of priority substances to the environment. Dry cleaning facilities are covered by this bylaw.

This guide is designed to help you and other dry cleaning facility owners:

- understand if your facility uses and releases any ChemTRAC priority substances
- use ChemTRAC calculators to determine if you are required to report to the City of Toronto
- use the ChemTRAC online reporting system to submit data to the City, and
- consider ways to reduce your environmental impact.

Additional information on the ChemTRAC program and the Environmental Reporting and Disclosure Bylaw is available by calling 3-1-1 or online at:

**<http://www.toronto.ca/chemtrac/>**

## The Dry Cleaning Sector

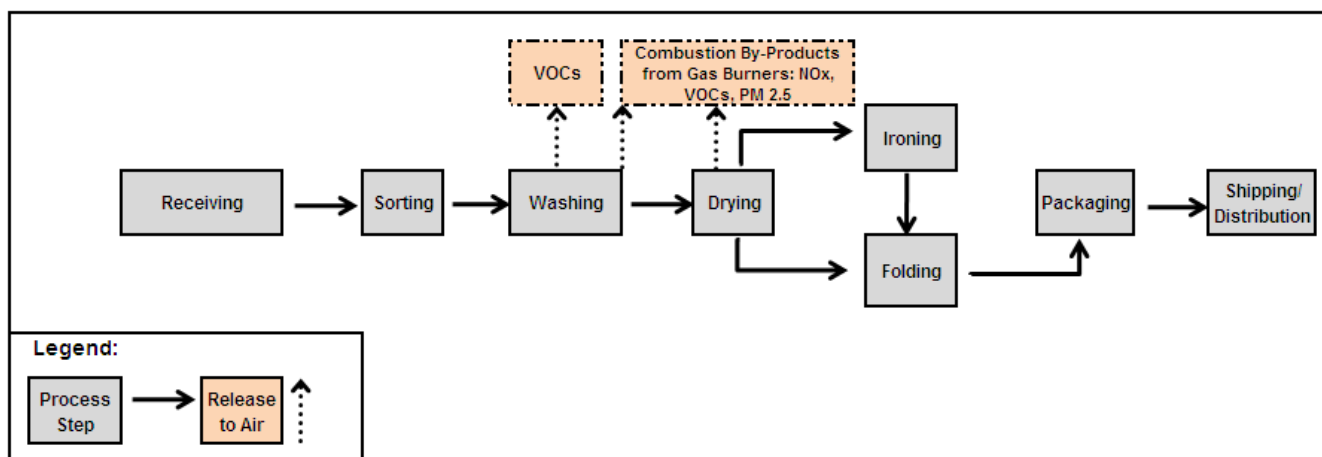
“Dry cleaning” facilities include both coin operated and independently operated facilities that provide dry cleaning, laundry pickup and delivery services. It is thus relevant to establishments with NAICS codes 812310, 812320, and 812330.

There is a ChemTRAC calculator for Dry Cleaning. Facilities that provide **both** laundry and dry cleaning services should use the calculator for Dry Cleaning. The Dry Cleaning calculator includes dry cleaning and dry cleaning service products and processes.

Dry cleaning facilities are required to report their data every year if they use or release any of the 25 substances above the reporting threshold. The report is due by June 30 each year. Annual data that is reported each June should cover the period from January 1 to December 31 of the previous year.

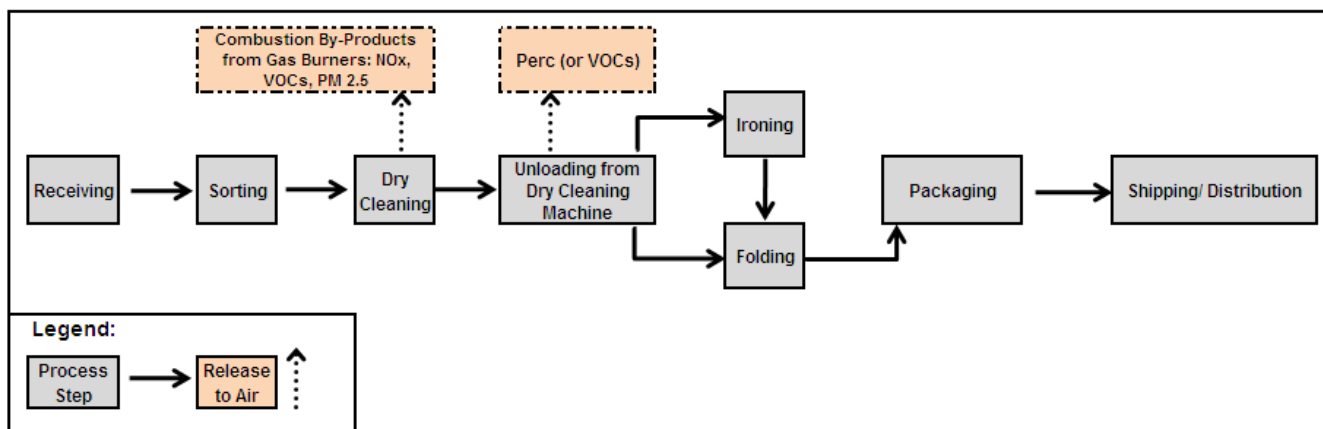
## Identifying ChemTRAC substances in dry cleaning facilities

Figure 1 shows the typical steps for providing laundry services. Most facilities will receive, sort, wash and dry items. Figure 1 also shows the ChemTRAC priority substances that are released in a typical laundry services facility: Volatile Organic Compounds (VOCs) and combustion by-products from natural gas burners.



**Figure 1. Typical laundry steps.**

Figure 2 shows the typical steps for providing dry cleaning services. Most facilities will receive, sort, clean and press items. Figure 2 also shows the ChemTRAC priority substances that are released in a typical dry cleaning facility: Perc, or volatile organic compounds (VOCs) if hydrocarbon-based solvents are used, and combustion by-products from natural gas burners.



**Figure 2. Typical dry cleaning steps.**

**Tetrachloroethylene ( Perchloroethylene):** Tetrachloroethylene, also known as "Perc", is widely used as a dry-cleaning solvent.

**Volatile Organic Compounds (VOCs).** VOCs are a group of organic chemicals that easily evaporate into the air. You can often smell them. VOCs are released from dry

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

cleaning solvents that are hydrocarbon-based, such as DF-2000. VOCs are also released from laundry products including detergents and fabric softeners.

**Combustion by-products from natural gas burners.** Several substances are released when natural gas is burned (i.e. combusted) for washing and drying.

When natural gas is combusted to generate heat, it releases ChemTRAC priority substances. Nitrogen oxides are released in the most significant quantities.

### The health effects of Perc, VOCs, and NO<sub>x</sub>

**Perc.** Tetrachloroethylene is probably carcinogenic to humans. It has been linked to an increased risk of a variety of cancers in several systems of the human body, including both mononuclear cell leukemia and liver tumours. Individuals may experience this increased risk of cancer as a result of being chronically exposed to tetrachloroethylene by inhalation.

**VOCs.** Short-term health effects of exposure to VOCs may include: eye, nose, and throat irritation, headaches, loss of coordination, and nausea. Over longer periods, VOCs can damage the liver, kidneys, and central nervous system.

**NO<sub>x</sub>.** Long-term exposure to NO<sub>x</sub> causes or worsens respiratory disease such as emphysema and bronchitis, and can aggravate existing heart disease.

For more information on the health effects of these substances, as well as other ChemTRAC priority substances, visit

<http://www.toronto.ca/health/chemtrac/substances.htm>

Table 1 on the next page lists the ChemTRAC substances released from the different processes in your facility. The ChemTRAC calculator can help you estimate the level of these substances in your business.

Most of the substances listed in Table 1 are released in very small amounts. It is likely that only VOCs and NO<sub>x</sub> might be released in amounts that could require reporting to the ChemTRAC program.

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

**Table 1. ChemTRAC substances released in a typical dry cleaning facility and their sources**

ChemTRAC priority substances	Steps in process	
	Washing: dry cleaning solvents, detergents and fabric softeners	Washing and drying: natural gas combustion
Benzene		X
Cadmium and its compounds		X
Chromium (non-hexavalent) and its compounds		X
Formaldehyde		X
Lead and its compounds		X
Manganese and its compounds		X
Mercury and its compounds		X
Nickel and its compounds		X
Nitrogen Oxides (NO <sub>x</sub> )		X
Particular Matter (PM <sub>2.5</sub> )		X
Tetrachloroethylene	X	
Polycyclic Aromatic Hydrocarbons (PAHs)		X
Volatile Organic Compounds (VOCs)	X	X
Total		

### Calculating emissions

To help Toronto businesses calculate their emissions and comply with the Environmental Reporting and Disclosure Bylaw, Toronto Public Health developed calculators that are specific to industrial sectors and processes. Access these calculators from the ChemTRAC website at

[http://www.toronto.ca/health/chemtrac/industries/laundry\\_cleaning.htm](http://www.toronto.ca/health/chemtrac/industries/laundry_cleaning.htm)

These calculators help businesses do three things:

- Identify which ChemTRAC priority substances are used or released in their facility
- Calculate the amounts of ChemTRAC priority substances used or released
- Determine what they are required to report to the ChemTRAC program.

Appendix B describes how the calculators calculate estimates of the quantities of ChemTRAC priority substances that are released from your facility.

The release of ChemTRAC priority substances can be calculated using methods other than the ChemTRAC calculators. For a list of alternative methods, see [http://www.toronto.ca/health/chemtrac/industries/laundry\\_cleaning.htm](http://www.toronto.ca/health/chemtrac/industries/laundry_cleaning.htm)

In the next section, we will work through worksheets to prepare you to use the ChemTRAC calculator for Dry cleaning.



## Worksheets for collecting information

The worksheets found on the next page are intended to help you collect all the information needed to use the ChemTRAC calculator for Dry cleaning. Three worksheets are provided:

- Worksheet 1 – Dry cleaning solvent
- Worksheet 2 – Natural gas equipment for dry cleaning, washing, and drying
- Worksheet 3 – Detergents and fabric softeners

A printer-friendly version of these worksheets can be found in Appendix A. They can be printed and completed by hand so that you have all information available on-hand for entry into the ChemTRAC calculator.

Note: if your facility has more processes than are included in the ChemTRAC calculator for Dry cleaning, you may need to use additional calculators to identify other emissions. You would then add these amounts to the numbers generated by the ChemTRAC calculator for Dry cleaning. You can use ChemTRAC's "Calculation of Totals" calculator to combine the findings of multiple calculators and determine if you exceed ChemTRAC thresholds. See Appendix C for more details.

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### Worksheet 1– Dry Cleaning Solvent

This worksheet will help you collect information on the quantity of dry cleaning solvent used by your dry cleaning machine, and on any relevant emissions control technologies. You should collect data on your facility for the period from January 1 to December 31 of a calendar year.

#### 1. Why type and how much dry cleaning solvent is used?

You can estimate how much dry cleaning solvent you used last year by multiplying the number of containers used by the volume or mass of each container of liquid. Enter this data in the table below.

*Example: 2 drums per year \* 100 L per drum = 200 L per year*

Type of dry cleaning solvent used	Drums per year	Size of drum	Units	Total quantity used
<input type="checkbox"/> Perc. <input type="checkbox"/> DF-2000 <input type="checkbox"/> Versatec (D-2050) <input type="checkbox"/> Stoddard Solvent <input type="checkbox"/> PureDry <input type="checkbox"/> Impress <input type="checkbox"/> Rynex <input type="checkbox"/> EcoSolv (HC-DCF High Flash) <input type="checkbox"/> Hydroclene <input type="checkbox"/> Shell Sol 140 HT	_____	_____	<input type="checkbox"/> litres <input type="checkbox"/> gallons <input type="checkbox"/> cubic metres <input type="checkbox"/> cubic feet <input type="checkbox"/> lbs <input type="checkbox"/> kilograms <input type="checkbox"/> grams <input type="checkbox"/> ounces	_____
<u>Example:</u> <input checked="" type="checkbox"/> Perc.	<u>2</u>	<u>100</u>	<input checked="" type="checkbox"/> litres	$2 * 100 L = 200 L$

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

### 2. What type of dry cleaning machine do you operate?

You can find this information in your equipments' operating manuals.

<b>Type of dry cleaning machine used is (add an X):</b>	
a. Converted	_____
b. Primary (Spin Disk Only)	_____
c. Primary (Cartridge Only)	_____
d. Primary (Combo)	_____
e. Primary (Average)	_____
f. Secondary (Spin Disk Only)	_____
g. Secondary (Cartridge Only)	_____
h. Secondary (Combo)	_____
i. Secondary (Average)	_____
<u>Example:</u>	
h. Secondary (Combo)	<u>    X    </u>

Converted machines are those that have been converted from a vented to closed-loop system.

Primary machines use refrigerated condensation to recover the solvent. Primary machines are often referred to as third generation.

Secondary machines utilize additional emission controls, such as carbon adsorbers. Secondary machines may be referred to as fourth or fifth generation.

### 3. How many filters were disposed during the year?

Please enter the number of filters disposed in the following table. If you do not know how many filters were disposed, please use the default values provided below.

<b>Number of filters disposed:</b>	_____ Filters
<u>Example:</u>	
Number of filters disposed:	<u>    6    </u> Filters

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Default Number of Filters Disposed per year.

Machine Type	Default Number of Filters
Converted	22
Primary (Spin Disk Only)	0
Primary (Cartridge Only)	18
Primary (Combo)	14
Primary (Average)	10
Secondary (Spin Disk Only)	0
Secondary (Cartridge Only)	10
Secondary (Combo)	6
Secondary (Average)	5

### Worksheet 2 – Natural gas equipment for dry cleaning, washing and drying

This worksheet will help you collect information on the quantity of natural gas used by your dry cleaning machine, washers, and dryers, and on any relevant emissions control technologies. Your dry cleaning machine requires steam, and your washer may use hot water, your dryer may require natural gas to heat the intake air. You should collect data on your facility for the period from January 1 to December 31 of a calendar year.

#### 1. What control technologies are installed on your natural gas equipment?

You can find this information in your equipments' operating manuals. Descriptions of control technologies can be found in *Control technologies for reducing emissions*. If you do not know which control technologies are in place, assume that none are used.

**Equipment is equipped with (add a checkmark):**

- a. Low NO<sub>x</sub> burners only \_\_\_\_\_
- b. Low NO<sub>x</sub> burners with recirculated flue gas \_\_\_\_\_
- c. None (no control technologies) \_\_\_\_\_

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

### 2. How much natural gas is used to power your dry cleaning machines, washers, and dryers?

This question can be answered using EITHER Option A or Option B.

#### Option A – What is the total amount of natural gas used by your dry cleaning machines, washers and dryers?

You can get this information from your annual gas bills. You should consider only gas used for dry cleaning machines, washers and dryers. One way to know how much gas is used to heat your equipment is to compare winter and summer bills. Winter bills will likely include process equipment **and** facility heating. Summer months will likely include **only** washers and dryers.

#### Option B – What is the thermal rating of your equipment?

This rating (in BTU/hr or kJ/hr) can be found in your equipment operating manuals. You will also need to estimate the average number of hours per day, days per week, and weeks per year that the equipment is used.

<b>Option A. Total natural gas used to power process equipment</b>	
_____ m <sup>3</sup> (cubic metres) OR	_____ ft <sup>3</sup> (cubic feet)
<u>Example: 2000</u> m <sup>3</sup> (cubic metres) OR	_____ ft <sup>3</sup> (cubic feet)
OR	
<b>Option B. Thermal rating of the equipment</b>	
_____ BTU/hr OR _____ kJ/hr	
Also estimate the average time that the equipment is in operation:	
_____ hours per day and _____ days per week and _____ weeks per year	

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

### Worksheet 3 – Detergents and fabric softeners

This worksheet will help you collect information on the detergents and fabric softeners used in your facility. By filling in the tables, you will have all the information you need to use the calculator. You should collect data on your facility for the period from January 1 to December 31 of a calendar year.

#### 1. How much liquid laundry detergent do you use?

You can estimate how much liquid detergent you used last year by multiplying the number of containers used by the volume or mass of each container of liquid. Enter this data in the table below.

If it is easier, you can start by estimating the number of containers you purchase each week or month.

*Example:  $10 \text{ containers per month} * 12 \text{ months per year} = 120 \text{ containers per year}$   
 $120 \text{ containers per year} * 50 \text{ L per container} = 6000 \text{ L per year}$*

#### Quantity of detergent used

Containers per year	Size of containers	Units	Total quantity used
_____	_____	<input type="checkbox"/> litres <input type="checkbox"/> gallons <input type="checkbox"/> cubic metres <input type="checkbox"/> cubic feet <input type="checkbox"/> lbs <input type="checkbox"/> kilograms <input type="checkbox"/> grams <input type="checkbox"/> ounces	_____
<i>Example: 120</i>	<i>50</i>	<input checked="" type="checkbox"/> litres	<i><math>120 * 50 = 6,000 \text{ L}</math></i>

#### 2. How much powder laundry detergent do you use?

You can estimate how much powder detergent you used last year by multiplying the number of containers used by the volume or mass of each container of liquid. Enter this data in the table below.

If it is easier, you can start by estimating the number of containers you purchase each week or month.

*Example:  $1 \text{ containers per month} * 12 \text{ months per year} = 12 \text{ containers per year}$   
 $12 \text{ containers per year} * 4 \text{ kg per container} = 48 \text{ kg per year}$*

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### Quantity of detergent used

Containers per year	Size of containers	Units	Total quantity used
_____	_____	<input type="checkbox"/> litres <input type="checkbox"/> gallons <input type="checkbox"/> cubic metres <input type="checkbox"/> cubic feet <input type="checkbox"/> lbs <input type="checkbox"/> kilograms <input type="checkbox"/> grams <input type="checkbox"/> ounces	_____
<u>Example: 12</u>	<u>4</u>	<input checked="" type="checkbox"/> kilograms	<u>12 * 4 = 48 kg</u>

### 3. How much liquid fabric softener do you use?

You can estimate how much fabric softener you used last year by multiplying the number of containers used by the volume or mass of each container. Enter this data into the table on the next page. If it is easier, you can start by estimating the number of containers you purchase each week or month.

*Example: 2 containers per month \* 12 months per year = 24 containers per year  
 24 containers per year \* 50 L per container = 1200 L per year*

### Quantity of fabric softener used

Containers per year	Size of containers	Units	Total quantity used
_____	_____	<input type="checkbox"/> litres <input type="checkbox"/> gallons <input type="checkbox"/> cubic metres <input type="checkbox"/> cubic feet <input type="checkbox"/> lbs <input type="checkbox"/> kilograms <input type="checkbox"/> grams <input type="checkbox"/> ounces	_____
<u>Example: 24</u>	<u>50</u>	<input checked="" type="checkbox"/> litres	<u>24 * 50 = 1,200 L</u>

### 4. Does your facility treat wastewater onsite?

Use an 'X' in the table below to indicate whether or not your facility treats wastewater onsite.

Is wastewater treated onsite?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>Example:</u> Is wastewater treated onsite?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

### *Using the calculator*

To calculate your use and release of ChemTRAC substances, you need to enter the information from the worksheets in this guide into the appropriate sections of the ChemTRAC calculator for dry cleaning. The ChemTRAC calculator will then automatically calculate the quantities of ChemTRAC substances released from processes found in your dry cleaning facility. This section of the guide provides a step-by-step walkthrough of the use of the calculator.

### *Getting started*

The ChemTRAC calculator for dry cleaning facilities can be read with software such as Microsoft Excel or Open Office. To find a copy of the calculator, go to [http://www.toronto.ca/health/chemtrac/industries/laundry\\_cleaning.htm](http://www.toronto.ca/health/chemtrac/industries/laundry_cleaning.htm)

The calculator consists of four different screens:

1. Instructions
2. Input-Output
3. Calculations
4. References

**You only have to enter information into the Input-Output screen.** The Instructions screen illustrated below in Figure 3 can help you use the calculator. The other screens are provided mainly for reference and are discussed in Appendix B. You do not need to enter information in these screens.<sup>1</sup>

You can navigate between screens by clicking the navigation buttons on the left side of each screen or by clicking on the tabs at the bottom of each screen. These navigation buttons are illustrated on the next page in Figure 3.

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<sup>1</sup> If you have site-specific emission factors for any ChemTRAC substance, they can be entered manually in the Calculator screen. See Appendix B for details.



## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

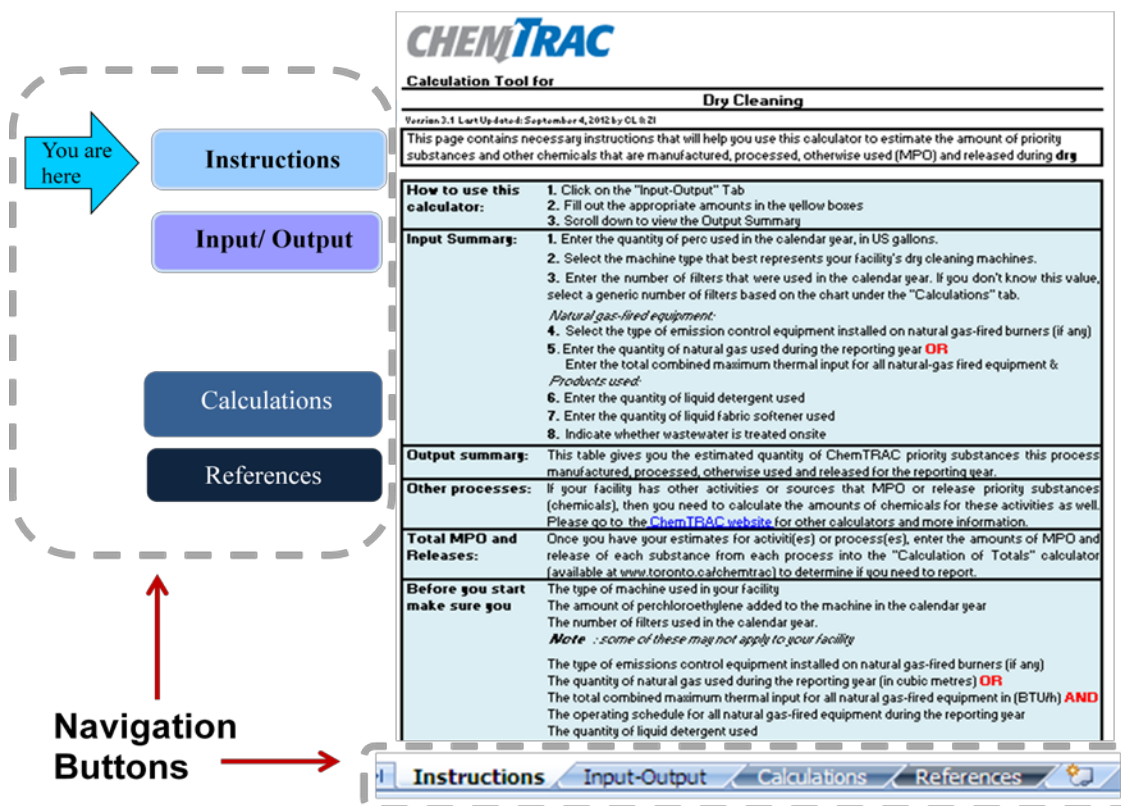


Figure 3. The Instructions screen.

### The Instructions screen

The calculator opens on the Instructions screen. This screen contains instructions on how to use the calculator to estimate the amount of ChemTRAC substances and other substances that are used and released by your dry cleaning facility. It also provides a brief overview of the contents of the calculator. **You do not need to enter information on this screen.**

### The Input-Output screen

The Input-Output screen is where you will enter all of the information applicable to your facility. Information is typed in **yellow boxes**. Any cells that do not apply to your facility can be left blank. **Dropdown menus** are also used to input some information.

The Input-Output screen can be filled out using the responses to the questions found within **Worksheets 1, 2, and 3** of this guide.

Once you input your facility's information into the appropriate yellow boxes and dropdown menus, the calculator automatically calculates the quantities of ChemTRAC substances that are manufactured, processed, otherwise used and released to air from your facility.<sup>2</sup> The values are displayed in the **Output Summary**

<sup>2</sup> The definitions for 'Manufactured', 'Processed', 'Otherwise Used', and 'Released to Air' can be found on the References screen of the ChemTRAC calculator.

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**Table** found at the bottom of the Input-Output screen. The next pages will walk you through the Input-Output screen. The images on the next pages illustrate the different areas of the input-output screen.

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

**Please complete the INPUT tables below**

Type of Solvent used for cleaning <sup>a</sup>	Solvent Type	
Amount of Solvent Used in the Year	0	Select Unit
Select Machine Type from the list <sup>b</sup>	Converted	
Number of Filters Disposed <sup>c</sup>	0	

**Enter Data from  
Worksheet 1 here**

Identify emissions control installed <sup>**</sup> :	Please Select
<b>** This field is mandatory</b>	
<b>Please complete ONLY A or B</b>	
A) the quantity of natural gas (NG)	
Quantity of natural gas consumed:	0 Select units
<b>OR</b>	
B) thermal input and operating schedule	
Total maximum thermal input for all equipment:	0 Select units
Operating schedule:	0 hours/day
	0 days/week
	0 weeks/year

**Enter Data from  
Worksheet 2 here**

Total amount of liquid laundry detergent used:	0	Select units
Total amount of powder laundry detergent used:	0	Select units
Total amount of liquid fabric softener used:	0	Select units
Is used waste water treated onsite?	Select	

**Enter Data from  
Worksheet 3 here**

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

**OUTPUT SUMMARY (Only ChemTRAC priority substances)**

ChemTRAC Priority Substances	Quantity (kg/yr)			
	Manufactured <sup>1</sup>	Processed <sup>1</sup>	Otherwise Used <sup>1</sup>	Released to Air <sup>1</sup>
Benzene	0	0	0	0
Cadmium, and its compounds	0	0	0	0
Chromium (non-hexavalent), and its compounds	0	0	0	0
Formaldehyde	0	0	0	0
Lead, and its compounds	0	0	0	0
Manganese, and its compounds	0	0	0	0
Mercury, and its compounds	0	0	0	0
Nickel, and its compounds	0	0	0	0
Nitrogen Oxides (NOx)	0	0	0	0
Particulate Matter (PM2.5)	0	0	0	0
Tetrachloroethylene (Perchloroethylene)	0	0	0	0
Total PAHs	0	0	0	0
Volatile Organic Compounds (VOCs)	0	0	0	0

The Output values are calculated here

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

### Entering information from Worksheet 1: Dry cleaning solvent

The image below displays the area of the Input-Output screen where you enter information about the dry cleaning solvent and type of dry cleaning machine. The sample information from **Worksheet 1** is entered into the appropriate areas of the screen.

**Question 1:** “Perc” is selected from the dropdown menu as the type of dry cleaning solvent used.

**Question 1:** “200” is typed into the yellow box as the quantity of Perc used. “Litre” is selected as the unit of measurement from the dropdown menu.

**Question 2:** “Secondary (Combo)” is selected from the dropdown menu as the type of dry cleaning machine used.

**Question 3:** “6” is typed into the yellow box as the number of filters disposed.

Type of Solvent used for cleaning <sup>a</sup>	Perc	
Amount of Solvent Used in the Year	200	Litre
Select Machine Type from the list <sup>b</sup>	Secondary (Combo)	
Number of Filters Disposed <sup>c</sup>	6	

### Entering information from Worksheet 2: Natural gas equipment for dry cleaning, washing, and drying

The image below displays the area of the Input-Output screen where you enter information on natural gas powered equipment. The sample information from **Worksheet 2** is entered into the appropriate areas of the screen.

**Question 1:** “None” (uncontrolled) is selected from the dropdown menu.

**Question 2: Option A:** “2000” is typed into the yellow box as the quantity of natural gas used. “Cubic metres” is selected as the unit of measurement from the dropdown menu.

The part of the screen that applies to **Option B** is left blank.

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

Identify emissions control installed <sup>**</sup> :			None (Uncontrolled)
<b>** This field is mandatory</b>			
Please complete <b>ONLY A or B</b>			
A) the quantity of natural gas (NG)			
Quantity of natural gas consumed:	2,000	cubic metres	
<b>OR</b>			
B) thermal input and operating schedule			
Total maximum thermal input for all equipment	0	Select units	
Operating schedule:	0	hours/day	
	0	days/week	
	0	weeks/year	

### Entering information from Worksheet 3: Detergents and fabric softeners

The image below displays the area of the Input-Output screen where you enter information on detergents and fabric softeners. The sample information from **Worksheet 3** is entered into the appropriate areas of the screen.

**Question 1:** “6000” is typed into the yellow box for amount of liquid laundry detergent used. “Litres” is selected from the dropdown menu.

**Question 2:** “48” is typed into the yellow box for amount of powder laundry detergent used, and “kg” is selected from the dropdown menu.

**Question 3:** “1200” is typed into the yellow box for amount of liquid fabric softener used, and “litres” is selected from the dropdown menu.

**Question 4:** As an example, “No” is selected from the dropdown menu in response to the question, “Is used waste water treated onsite?”

Total amount of liquid laundry detergent used:	6,000	litres
Total amount of powder laundry detergent used:	48	kg
Total amount of liquid fabric softener used:	1,200	litres
Is used waste water treated onsite?	No	

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

### Reading the Output Summary table

The Output Summary table displays the quantities of ChemTRAC substances that are manufactured, processed, otherwise used, and/or released in your facility. These values are the results of all of the calculations based on the information entered in the Input-Output Screen. The Output table below is the result of the sample information entered in the *Using the Calculator* section above.

OUTPUT SUMMARY (Only ChemTRAC priority substances)				
ChemTRAC Priority Substances	Quantity (kg/yr)			
	Manufactured <sup>1</sup>	Processed <sup>1</sup>	Otherwise Used <sup>1</sup>	Released to Air <sup>1</sup>
Benzene	0	0	0	0
Cadmium, and its compounds	0	0	0	0
Chromium (non-hexavalent), and its compounds	0	0	0	0
Formaldehyde	0	0	0	0
Lead, and its compounds	0	0	0	0
Manganese, and its compounds	0	0	0	0
Mercury, and its compounds	0	0	0	0
Nickel, and its compounds	0	0	0	0
Nitrogen Oxides (NO <sub>x</sub> )	3	0	0	3
Particulate Matter (PM <sub>2.5</sub> )	0	0	0	0
Tetrachloroethylene (Perchloroethylene)	0	0	323	79
Total PAHs	0	0	0	0
Volatile Organic Compounds (VOCs)	0	0	1,872	13

<sup>1</sup> Definitions available on References tab

You should compare the values that are manufactured, processed or otherwise used to the ChemTRAC reporting thresholds to see if you are required to report ChemTRAC substances. See Interpreting Results on page 22 for more details.

### Interpreting results

**Compare results to thresholds.** Once the amounts of ChemTRAC substances manufactured, processed, otherwise used, and released have been calculated, you must compare these amounts to the ChemTRAC reporting thresholds listed in the Environmental Reporting and Disclosure Bylaw.<sup>3</sup> These thresholds are also listed in Appendix C of this guide.

**If results exceed thresholds you must report.** If a ChemTRAC priority substance is manufactured, processed, otherwise used, or released in an amount equal to or greater than its ChemTRAC reporting threshold, then you would need to report that substance and the quantity released to air.

**Combining multiple calculation methods.** Some facilities may need to add results of the ChemTRAC calculator for dry cleaning with emissions from other processes that happen in the facility. This is discussed in Appendix C.

If there are no other processes, and the ChemTRAC calculator is the only tool used to estimate emissions, then the values in the Output Summary table can be compared directly to the ChemTRAC reporting thresholds. An example is provided in Table 2.

Table 2 on the next page compares the output summary table from the section above to ChemTRAC thresholds. This example uses the values from the worksheets and from the section *using the calculator*.

---

<sup>3</sup> The full by-law can be found at <http://www.toronto.ca/health/chemtrac/report.htm>.



## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

**Table 2. Comparison of output from the ChemTRAC calculator and reporting thresholds**

Output Summary table from the ChemTRAC calculator					Comparison to reporting thresholds	
ChemTRAC Priority Substances	Manufactured (kg/yr)	Processed (kg/yr)	Otherwise used (kg/yr)	Released to air (kg/yr)	ChemTRAC threshold (kg/yr)	Is reporting required?
Benzene	0	0	0	0	100	No
Cadmium and its compounds	0	0	0	0	1	No
Chromium, non-hexavalent and its compounds	0	0	0	0	100	No
Formaldehyde	0	0	0	0	100	No
Lead and its compounds	0	0	0	0	10	No
Manganese and its compounds	0	0	0	0	10	No
Mercury and its compounds	0	0	0	0	1	No
Nickel and its compounds	0	0	0	0	100	No
<b>Nitrogen Oxides</b>	<b>3</b>	0	0	<b>3</b>	<b>200</b> (released to air)	<b>No</b>
Particular Matter (PM <sub>2.5</sub> )	0	0	0	0	30 (released to air)	No
<b>Tetrachloroethylene (Perchloroethylene)</b>	<b>0</b>	<b>0</b>	<b>323</b>	<b>79</b>	<b>100</b>	<b>Yes</b>
PAHs	0	0	0	0	10	No
<b>Volatile Organic Compounds (VOCs)</b>	0	0	<b>1,872</b>	<b>13</b>	<b>100</b> (released to air)	<b>No</b>

In the example shown in Table 2, Tetrachloroethylene is otherwise used and released to air in quantities above the reporting threshold. Therefore, in this example, the use and release of Tetrachloroethylene must be reported to ChemTRAC.

## Reporting to ChemTRAC

**You are only required to report to ChemTRAC if you meet or exceed reporting thresholds for one or more priority substances.**

Facilities that meet or exceed reporting thresholds for one or more substances must use the Online Reporting System to report to the ChemTRAC program. You can access the system from any computer with an internet connection. If your facility is exempt or below reporting thresholds, you can use the system to notify the City and volunteer environmental information.

You can find the online reporting system on the ChemTRAC webpage:  
**<http://www.toronto.ca/health/chemtrac/report.htm>**.

*You will need the following information to report to ChemTRAC*

- Your First Time Access Code **OR** Registration ID
- Your facility name, address, number of employees and contact information
- Your NAICS code
- The names of substances you are reporting
- Quantities of priority substances (in kilograms).

The screenshot shows the ChemTRAC website interface. At the top is the ChemTRAC logo. Below it is a navigation bar with links: Overview, For Business, For Communities, Disclosure Reports, Links, Contact Us, and E-news. Underneath the navigation bar are links for '4 steps to reporting', 'Reporting exemptions', 'Reporting FAQ', and 'Business FAQ'. The main heading is '4 Steps to Reporting'. Below this heading is a link to 'Reporting to the Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423)'. A text block states: 'The following steps are provided as a guide to help you report:'. Below this is a four-step process flow:

- Step 1**: Determine if the Bylaw applies to your facility
- Step 2**: Determine if you need to report in a given year.
- Step 3**: Prepare your data for reporting
- Step 4**: Submit your data online by June 30th each year

To the right of the steps is a section titled 'Ready to report?' with a button for 'ChemTRAC Online Reporting'. A callout box with an arrow points to this button, containing the text: 'Click here to access the online reporting system'. Below the 'Ready to report?' section is a 'See reported data' section with a button for 'ChemTRAC Data Map'. At the bottom right, a blue box contains a message: 'The deadline for reporting 2011 data has passed. If you missed the deadline and still need to report, please [contact us](#) immediately.'

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

### *Read and consent to the Terms of Use*

- [Frequently asked questions](#)
- [Contact us](#)
- [Terms of use](#)
- [User Guide](#)

**ChemTRAC**  
You are in a secure site.



**Welcome to the ChemTRAC data reporting system**  
  
This application will allow you to:

- Report the use and release of priority substances under Toronto's Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423)
- Indicate if your facility is below reporting thresholds
- Indicate that the reporting requirements do not apply to your facility
- Provide information on your facility's environmental activities

  
To report online, you will need the **First Time Access Code** or your **Registration ID**.  
  
To protect your privacy and security it is recommended that you close the browser after submitting your information.  
  
To protect the secured exchange of information between you and this secure site, this transaction requires that your browser supports 128-bit data encryption. To continue, you may be asked to download and install the latest version of your browser.  
  
As a security precaution, page sessions will end automatically as indicated at the top of each page.

To proceed with reporting information on chemical use and release you must read and consent to the [Terms of Use](#) and click the **I Agree** button below.

**Note:** Use of the browser Back button is not supported. Please use the reporting system's back/next button(if applicable) to navigate when necessary.

### *First Time Access Code for new users*

If you are a first time user, you will need a "First Time Access Code" to use the system. The City sends most businesses their First Time Access Code by mail. If you did not receive or have lost your First Time Access Code, please call 3-1-1.

### *Registration ID for facilities already in the system*

If you have already reported in the online system, you have been issued a Registration ID. This ID number is to be used for future visits to the ChemTRAC reporting system. If you have lost your Registration ID, please call 416-338-7600.

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

First Time Signing In?

Register with First Time Access Code

Already Registered?

Registration ID:

If you have lost or forgotten your Registration ID, please contact us at (416) 338-7600

Sign In

### *Once you have entered the online reporting system*

The online system has seven steps. You will see your progress at the top of the screen. In the screenshot below, Step 1 is complete and Step 2 is in progress.

**Toronto**

**ChemTRAC**  
You are in a secure site.

[Frequently asked questions](#)  
[Contact us](#)  
[Terms of use](#)  
[User Guide](#)

**Step 1** Facility Registration  
**Step 2** Reporting Period  
**Step 3** Chemical Selection  
**Step 4** Use & Release (0 of 0)  
**Step 5** Environmental Statement  
**Step 6** Summary Notification  
**Step 7** Confirmation & Print

15min Note: This registration session will automatically end fifteen minutes after this Web page has finished loading.

To move to the next step, you must enter all the required information on the screen and click the “Next” button at the bottom of the screen. You can use the “Back” button to change the information you provided in previous steps.

Please remember to have all your information ready before you enter the system. **You will only have fifteen minutes to complete each screen before the system logs you out.** If your session expires before you hit the “submit” button, you will need to re-enter all your information. If you are running out of time, you can reset the countdown without losing information by switching to a different page then returning to the page you were working on.

### *Step 1. Facility registration*

In Step 1, you will enter your facility name, address, number of employees and company contact information. You will also enter your **NAICS code** in the section entitled “Type of facility”. You must begin by selecting the 2-digit NAICS code from the dropdown menu. For dry cleaning facilities, this will be “81 – Other Services”. Then, you can select the appropriate 4-digit code (8123), and finally, the 6 digit code (812310, 812320, or 812330).

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

<b>NAICS 2-Digit:</b>	81 – Other Services (exc. Public Administration)	▲▼
<b>NAICS 4-Digit:</b>	8123 – Dry Cleaning and Laundry Services	▲▼
<b>NAICS 6-Digit:</b>	812330 – Linen & Uniform Supply	▲▼

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

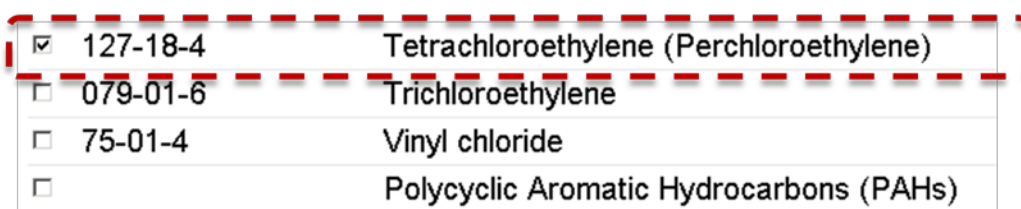
### Step 2. Reporting period

In Step 2, you will choose the calendar year from the dropdown menu and select **"I meet the reporting requirements and am providing data"**.

If your calculations showed you to be below the reporting threshold, you can select, **"I do not meet reporting thresholds"**.

### Step 3. Chemical selection

In Step 3, you will identify the substances that your facility used or released at or above reporting thresholds. **The example below builds off of Table 2 in this guide.** Recall that Tetrachloroethylene was the only substance that exceeded ChemTRAC mass reporting thresholds.



<input checked="" type="checkbox"/>	127-18-4	Tetrachloroethylene (Perchloroethylene)
<input type="checkbox"/>	079-01-6	Trichloroethylene
<input type="checkbox"/>	75-01-4	Vinyl chloride
<input type="checkbox"/>		Polycyclic Aromatic Hydrocarbons (PAHs)

### Step 4. Use and release

In Step 4, you will enter information for each substance that you identified in Step 3. You will begin by determining whether a substance was used or released, and from where / to where.

You will then need to **enter the total quantity of the substances that your facility manufactured and released, in kilograms and without decimals**. For example, 17.2 kg would be rounded to 17 kg and 17.6 kg rounded to 18 kg.













Finally, you will select an estimation method from the dropdown menu.

**Select “ChemTRAC calculator” if you have used the ChemTRAC calculator.**

The example on the next page illustrates how to complete Step 4 for Tetrachloroethylene using information from **Table 2** of this guide.

**For dry cleaning facilities, Tetrachloroethylene is “Otherwise Used” and “Released to Air”. This information was estimated using the ChemTRAC calculator for dry cleaning.**

## Part 1: Gathering data, using the calculator, and reporting to ChemTRAC

Tetrachloroethylene (Perchloroethylene) (Reporting Threshold = 100.0 kg)		
Quantity (kg)	Estimation Method	
If you used more than one method to estimate data, please choose the main one		
Manufactured: 	<input type="text"/>	- Select Estimation Method From List - 
Processed: 	<input type="text"/>	- Select Estimation Method From List - 
Otherwise Used: 	<input type="text" value="323"/>	ChemTRAC calculator 
<b>Total Use:</b>	<input type="text" value="323"/>	
Release to Air: 	<input type="text" value="79"/>	ChemTRAC calculator 
Release to Land: 	<input type="text"/>	- Select Estimation Method From List - 
Release to Surface Water: 	<input type="text"/>	- Select Estimation Method From List - 
<b>Total Release:</b>	<input type="text" value="79"/>	

### Step 5. Environmental statement

In Step 5, you have the option of entering information about your environmental activities including: if you have completed environmental training courses, created a Pollution Prevention Plan, or adopted an Environmental Management System. Pollution Prevention Plans are discussed briefly in the Pollution prevention strategies section on page 31 of this guide. You will also specify if you report to the National Pollutant Release Inventory or to the Toronto Sewer Use Bylaw.

### Steps 6 and 7. Summary notification, confirmation and printing

In Steps 6 and 7, you will not enter any new information. You will review the information you provided, submit your report, and receive a printable record.

### Optional reporting for facilities below threshold levels of priority chemicals

For those businesses or facilities that do not meet or exceed ChemTRAC thresholds, the online reporting system allows you to identify yourself as a “non-reporter”. This will allow you to stay informed on ChemTRAC program initiatives. It will also help Toronto Public Health assess trends over time and gauge the effectiveness of the ChemTRAC program.

### Part 2: Reducing the environmental impact of your facility

*This section of the guide provides information about reducing the environmental impact of your facility.*

- *It provides an overview of pollution prevention strategies*
- *It identifies relevant control technologies for reducing emissions*
- *It provides guidance on getting started with pollution prevention.*



### Pollution prevention strategies

The ChemTRAC program requires facilities to report on substances that are manufactured, processes or otherwise used in quantities that are equal to or greater than ChemTRAC reporting thresholds. Although it is not required as part of the ChemTRAC program, it is good business practice for facilities to also take action to reduce the creation, use and release of ChemTRAC priority substances.

Minimizing the use and release of harmful substances at the source is called pollution prevention (or P2) and is widely recognized as good business practice. Collecting data for ChemTRAC gives you the information you need to consider P2 options in your facility.

#### How can a business benefit from pollution prevention (P2)?

- P2 can reduce operating costs from the use of chemicals and energy
- P2 can reduce the costs of waste management and the risk of liability
- P2 can improve worker health and safety
- P2 can improve community relations and build a business' reputation as socially and environmentally responsible
- P2 can improve a business' ability to respond to consumer demands for "greener" products

#### Pollution prevention strategies

Businesses have many options for reducing the use of harmful substances in their facilities. Not all of the options will be relevant to all businesses. Three types of strategies and examples specific to dry cleaning facilities are presented below.

1. **Use low-cost, good operating practices.** Simple changes to normal practices can reduce the use and release of harmful chemicals at no cost to business owners.  
*For example: Wash only full loads.*
2. **Install control technologies or equipment.** New control technologies and equipment can reduce the release of harmful chemicals and save money by improving operating efficiency.  
*For example: Install automated liquid injection wash systems to increase efficiency of detergent use.*
3. **Modify products or inputs.** Traditional products and processes can be replaced with alternatives that use and release less harmful chemicals.  
*For example: Switch to phosphate-free and/or low VOC laundering products.*

### Control technologies for reducing emissions

Control technologies can reduce the quantity of ChemTRAC substances that are released from dry cleaning facilities.

#### *Technology for reducing emissions from natural gas fired washers and dryers*

Recall that nitrogen oxides and other ChemTRAC substances are released from the combustion of natural gas. There are two common control technologies that can help decrease the amount of nitrogen oxides released as a by-product of combustion: low NO<sub>x</sub> burners and recirculated flue gas.<sup>4</sup>

**Low NO<sub>x</sub> burners.** When natural gas is used to create heat, the gas passes over a flame, gets combusted, generates heat, and produces combustion by-products, including NO<sub>x</sub>. A low NO<sub>x</sub> burner combusts the gas in several stages. This allows the flame to burn at a cooler temperature, which can reduce the amount of NO<sub>x</sub> that is created as a by-product by about 50%.

**Recirculated flue gas.** When natural gas gets combusted over the flame to produce heat, the resulting air containing the combustion by-products is called flue gas. If the flue gas is mixed back into the natural gas being fed to the flame (i.e. recirculated), this changes the combustion process and results in less NO<sub>x</sub> being produced. Recirculated flue gas is often used in conjunction with low NO<sub>x</sub> burners, reducing NO<sub>x</sub> emissions by about 70%.

#### *Technology for reducing VOC emissions from detergents and fabric softeners*

#### **The ChemTRAC calculator can be used to estimate a control technology's emission reduction potential.**

Without changing any of the other values entered in the Input-Output screen, select "low NO<sub>x</sub> burner" as a control for gas ovens. Check the new level of nitrogen oxides in the output table. It should be half the original number.

**Proper dilution of products.** Recall that VOCs are released from detergents and fabric softeners. To minimize VOC emissions, launderers should ensure that VOC concentrations are under 10% of the weight of the properly diluted product<sup>5</sup>.

Table 3 summarizes the control technologies discussed above.

**Table 3. Control technologies for VOCs and combustion by-products**

<sup>4</sup> NO<sub>x</sub> refers to total amounts of nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>).

<sup>5</sup> • Michigan Department of Environmental Quality. 2002. Industrial cleaners. [www.deq.state.mi.us/documents/deq-ead-p2-epp-green-cleaners.pdf](http://www.deq.state.mi.us/documents/deq-ead-p2-epp-green-cleaners.pdf)

## Part 2: Reducing your facility's environmental impact

Process or product	Control technology	ChemTRAC substance controlled
Combustion of natural gas	Low NO <sub>x</sub> burners	Nitrogen oxides (NO <sub>x</sub> )
	Recirculated flue gas with low NO <sub>x</sub> burners	
Detergents and fabric softeners	Proper dilution of products	Volatile organic compounds (VOCs)

### More ways to reduce costs and improve performance

Minimizing the use and release of harmful substances is one aspect of improving environmental performance. Dry cleaning facilities can also take other steps to improve their economic and environmental sustainability.

1. **Reduce energy use.** By reducing energy use, dry cleaning facilities can save money on energy bills and reduce their environmental impact. Many energy-efficiency technologies have very short payback periods. Utilities also offer incentives for energy efficiency measures.

To reduce energy use, low-cost, good operating procedures can be adopted, and new technology or equipment can be installed. This includes:

- Undergoing an energy audit to identify opportunities for savings
- Encouraging employees to turn off lights and equipment when not in use
- Replacing old equipment with more efficient equipment
- Installing a programmable thermostat to control heating and cooling
- Assigning one person to review and track energy usage and to investigate opportunities for energy savings.

2. **Reduce water use.** Working to reduce water use can save money and provide environmental benefits.

To reduce water use, low-cost, good operating procedures can be adopted, and new technology or equipment can be installed. This includes:

- Implementing soil-sorting procedures to minimize overwashing of lighter loads and to eliminate the need for rewashing
- Programming the number of cycles and the water fill level based on level of soiling
- Retrofitting conventional washers with holding tanks to capture final rinse waters (estimated 30% water savings)<sup>6</sup>
- Purchasing high efficiency washing machines, e.g. batch washers with counter-current flow (estimated 70% water savings)<sup>7</sup>
- Regularly checking water-supply equipment for leaks
- Posting signs near sinks and hoses to encourage employees to use less water
- Monitoring daily water usage in order to identify excess use.

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<sup>6</sup> North Carolina Division of Pollution Prevention and Environmental Assistance. August 2002. Water conservation checklist: Dry cleaning Operations. [www.p2pays.org/ref/23/22005.pdf](http://www.p2pays.org/ref/23/22005.pdf)

<sup>7</sup> Ibid.

### Getting started with pollution prevention

The good news is that you've already started by calculating emissions of ChemTRAC priority substances.

Next steps can include:

1. Evaluating actions to reduce the use and release of energy, water and ChemTRAC substances.
2. Identifying funding for upgrades to facilities and equipment.
3. Implementing all cost-effective upgrades.
4. Tracking changes in the use and release of energy, water and substances.

To help in these steps, ChemTRAC is offering **free technical assistance visits** and **training workshops** to assist businesses in creating an inventory of chemicals used at their facility, comply with the ChemTRAC program, and identify opportunities to improve their facilities' environmental performance.

For more information, visit:

[http://www.toronto.ca/health/chemtrac/business\\_resources.htm](http://www.toronto.ca/health/chemtrac/business_resources.htm) and

<http://www.toronto.ca/health/chemtrac/gogreen.htm>.

Additional resources on reducing the environmental impact of dry cleaning facilities include:

- North Carolina Division of Pollution Prevention and Environmental Assistance. August 2002. Water conservation checklist: Dry cleaning Operations. [www.p2pays.org/ref/23/22005.pdf](http://www.p2pays.org/ref/23/22005.pdf)
- Michigan Department of Environmental Quality. 2002. Industrial cleaners. [www.deq.state.mi.us/documents/deq-ead-p2-epp-greencleaners.pdf](http://www.deq.state.mi.us/documents/deq-ead-p2-epp-greencleaners.pdf)
- Toronto Public Health. December 2010. Resource for Greening Dry Cleaning and Dry cleaning: Pollution Prevention Information. <http://www.toronto.ca/health/chemtrac/pdf/GreenDryClean.pdf>
- US EPA. 1995. Pollution Prevention at Industrial Laundries. <http://nepis.epa.gov/Exe/ZyNET.exe/20002B2L.PDF?ZyActionP=PDF&Client=EPA&Index=1995%20Thru%201999&File=D%3AZYFILESINDE X%20DATA95THRU99TXT>
- US EPA. 2002. Practical Guide to Environmental Management for Small Businesses. [http://www.smallbiz-enviroweb.org/Resources/smallbizfiles/EM\\_Guide0902.pdf](http://www.smallbiz-enviroweb.org/Resources/smallbizfiles/EM_Guide0902.pdf)
- US EPA. 2009. Smart Steps to Sustainability: A Guide to Greening Your Small Business. [www.epa.gov/osbp/pdfs/smart\\_steps\\_greening\\_guide\\_042101.pdf](http://www.epa.gov/osbp/pdfs/smart_steps_greening_guide_042101.pdf)
- US EPA. 2011. Design for the Environment: Considerations for Partnership (Laundry). <http://www.epa.gov/dfe/pubs/laundry/consider/>

## Appendices

*The remaining pages of this guide offer additional material for your reference:*

### **Appendix A. Printer-friendly worksheets**

### **Appendix B. Additional material related to the ChemTRAC calculator**

- *Descriptions of the remaining calculator screens*
- *How the calculator uses emission factors to calculate quantities of ChemTRAC substances*
- *How emission factors can be changed to site-specific values.*

### **Appendix C. Combining the Dry Cleaning Calculator with other sources**

- *How to combine the ChemTRAC calculator for Dry cleaning facilities with emissions data from other sources.*

### **Appendix D. Reporting Checklist**

- *A checklist to help you ensure the data you submit in your ChemTRAC reports are accurate.*

## Appendix A. Printer-friendly worksheets

These worksheets can be printed and completed by hand so that all information can be readily available for entry into the ChemTRAC calculator.

### Worksheet 1– Dry Cleaning Solvent

This worksheet will help you collect information on the quantity of dry cleaning solvent used by your dry cleaning machine, and on any relevant emissions control technologies. You should collect data on your facility for the period from January 1 to December 31 of a calendar year.

#### 1. Why type and how much dry cleaning solvent is used?

You can estimate how much dry cleaning solvent you used last year by multiplying the number of containers you used by the volume or mass of each container of liquid. Enter this data in the table below.

*Example: 2 drums per year \* 100 L per drum = 200 L per year*

Type of dry cleaning solvent used	Drums per year	Size of drum	Units	Total quantity used
<input type="checkbox"/> Perc. <input type="checkbox"/> DF-2000 <input type="checkbox"/> Versatec (D-2050) <input type="checkbox"/> Stoddard Solvent <input type="checkbox"/> PureDry <input type="checkbox"/> Impress <input type="checkbox"/> Rynex <input type="checkbox"/> EcoSolv (HC-DCF High Flash) <input type="checkbox"/> Hydroclene <input type="checkbox"/> Shell Sol 140 HT	_____	_____	<input type="checkbox"/> litres <input type="checkbox"/> gallons <input type="checkbox"/> cubic metres <input type="checkbox"/> cubic feet <input type="checkbox"/> lbs <input type="checkbox"/> kilograms <input type="checkbox"/> grams <input type="checkbox"/> ounces	_____

## Additional Material

### 2. What type of dry cleaning machine do you operate?

You can find this information in your equipments' operating manuals.

**Type of dry cleaning machine used is (add an X):**

- |    |                            |       |
|----|----------------------------|-------|
| a. | Converted                  | _____ |
| b. | Primary (Spin Disk Only)   | _____ |
| c. | Primary (Cartridge Only)   | _____ |
| d. | Primary (Combo)            | _____ |
| e. | Primary (Average)          | _____ |
| f. | Secondary (Spin Disk Only) | _____ |
| g. | Secondary (Cartridge Only) | _____ |
| h. | Secondary (Combo)          | _____ |
| i. | Secondary (Average)        | _____ |

### 3. How many filters were disposed during the year?

Please enter the number of filters disposed in the following table. If you do not know how many filters were disposed, please use the default values provided below.

<b>Number of filters disposed:</b>	_____ Filters
------------------------------------	---------------

Default Number of Filters Disposed per year.

Machine Type	Default Number of Filters
Converted	22
Primary (Spin Disk Only)	0
Primary (Cartridge Only)	18
Primary (Combo)	14
Primary (Average)	10
Secondary (Spin Disk Only)	0
Secondary (Cartridge Only)	10
Secondary (Combo)	6
Secondary (Average)	5



## Additional Material

### Worksheet 2 – Natural gas equipment for dry cleaning, washing and drying

This worksheet will help you collect information on the quantity of natural gas used by your dry cleaning machine, washers, and dryers, and on any relevant emissions control technologies. Your dry cleaning machine requires steam, and your washer may use hot water, your dryer may require natural gas to heat the intake air. You should collect data on your facility for the period from January 1 to December 31 of a calendar year.

**1. What control technologies are installed on your natural gas equipment?**

You can find this information in your equipments' operating manuals.

Descriptions of control technologies can be found in *Control technologies for reducing emissions*. If you do not know which control technologies are in place, assume that none are used.

**Equipment is equipped with (add a checkmark):**

- |    |  |       |
|----|--|-------|
| a. | Low NO <sub>x</sub> burners only                       | _____ |
| b. | Low NO <sub>x</sub> burners with recirculated flue gas | _____ |
| c. | None (no control technologies)                         | _____ |

**2. How much natural gas is used to power your dry cleaning machines, washers and dryers?**

This question can be answered using EITHER Option A or Option B.

**Option A – What is the total amount of natural gas used by your dry cleaning machines, washers and dryers?**

You can get this information from your annual gas bills. You should consider only gas used for dry cleaning machines, washers and dryers. One way to know how much gas is used to heat your equipment is to compare winter and summer bills. Winter bills will likely include process equipment **and** facility heating. Summer months will likely include **only** washers and dryers.

**Option B – What is the thermal rating of your equipment?** This rating (in BTU/hr or kJ/hr) can be found in your equipment operating manuals. You will also need to estimate the average number of hours per day, days per week, and weeks per year that the equipment is used.

## Additional Material

<b>Option A. Total natural gas used to power process equipment</b>
_____ m <sup>3</sup> (cubic metres) OR _____ ft <sup>3</sup> (cubic feet)
<b>OR</b>
<b>Option B. Thermal rating of the equipment</b>
_____ BTU/hr OR _____ kJ/hr
Also estimate the average time that the equipment is in operation:
_____ hours per day and _____ days per week and _____ weeks per year

### Worksheet 3 – Detergents and fabric softeners

This worksheet will help you collect information on the detergents and fabric softeners used in your facility. By filling in the tables, you will have all the information you need to use the calculator. You should collect data on your facility for the period from January 1 to December 31 of a calendar year.

#### 1. How much liquid laundry detergent do you use?

You can estimate how much liquid detergent you used last year by multiplying the number of containers used by the volume or mass of each container of liquid. Enter this data in the table below.

If it is easier, you can start by estimating the number of containers you purchase each week or month.

*Example: 10 containers per month \* 12 months per year = 120 containers per year  
 120 containers per year \* 50 L per container = 6000 L per year*

#### Quantity of detergent used

Containers per year	Size of containers	Units	Total quantity used
_____	_____	<input type="checkbox"/> litres <input type="checkbox"/> gallons <input type="checkbox"/> cubic metres <input type="checkbox"/> cubic feet <input type="checkbox"/> lbs <input type="checkbox"/> kilograms <input type="checkbox"/> grams <input type="checkbox"/> ounces	_____

## Additional Material

### 2. How much powder laundry detergent do you use?

You can estimate how much powder detergent you used last year by multiplying the number of containers used by the volume or mass of each container of liquid. Enter this data in the table below.

If it is easier, you can start by estimating the number of containers you purchase each week or month.

*Example:  $1 \text{ containers per month} * 12 \text{ months per year} = 12 \text{ containers per year}$   
 $12 \text{ containers per year} * 4 \text{ kg per container} = 48 \text{ kg per year}$*

#### Quantity of detergent used

Containers per year	Size of containers	Units	Total quantity used
_____	_____	<input type="checkbox"/> litres <input type="checkbox"/> gallons <input type="checkbox"/> cubic metres <input type="checkbox"/> cubic feet <input type="checkbox"/> lbs <input type="checkbox"/> kilograms <input type="checkbox"/> grams <input type="checkbox"/> ounces	_____

### 3. How much liquid fabric softener do you use?

You can estimate how much fabric softener you used last year by multiplying the number of containers used by the volume or mass of each container. Enter this data into the table on the next page.

If it is easier, you can start by estimating the number of containers you purchase each week or month.

*Example:  $2 \text{ containers per month} * 12 \text{ months per year} = 24 \text{ containers per year}$   
 $24 \text{ containers per year} * 50 \text{ L per container} = 1200 \text{ L per year}$*

#### Quantity of fabric softener used

Containers per year	Size of containers	Units	Total quantity used
_____	_____	<input type="checkbox"/> litres <input type="checkbox"/> gallons <input type="checkbox"/> cubic metres <input type="checkbox"/> cubic feet <input type="checkbox"/> lbs <input type="checkbox"/> kilograms <input type="checkbox"/> grams <input type="checkbox"/> ounces	_____

### 4. Does your facility treat wastewater onsite?

### Additional Material

Use an 'X' in the table below to indicate whether or not your facility treats wastewater onsite.

Is wastewater treated onsite?	<input type="checkbox"/> Yes <input type="checkbox"/> No
-------------------------------	---

# Appendix B. Additional material related to the ChemTRAC calculator

This appendix describes the remaining screens of the ChemTRAC calculator. You do not need to enter any information into these screens.

This appendix also describes emission factors and how the ChemTRAC calculator makes use of them.

### *The ChemTRAC calculator Calculations screen*

The Calculations screen provides the calculations based on the information provided in the Input-Output screen. It also includes details on the emission factors used to calculate the release of substances and an indication of emission factor data quality. You do not need to enter any information on this screen. However, emission factors can be modified if site-specific information is available. For example, you can modify the default density of the dry cleaning solvent, the mass of solvent retained per filter, and the percentage of solvent transferred as sludge. You can also modify the default average VOC contents and densities of liquid detergent and liquid fabric softener. You can modify the emission factors for natural gas combustion listed in the Contaminant table, and for any of uncontrolled, low NO<sub>x</sub> and low NO<sub>x</sub> with recirculated flue gas scenarios. The location of these variables is illustrated below in Figures B.1 – B.5.

If any of the variables are modified in the Calculations screen, be sure that they are entered in appropriate units. All information and formulae presented in the Calculations screen are for reference only. Other than when using site-specific emissions factors, they should not be modified in any way.

## Additional Material

Solvent Type	Volume of Solvent Used (US gallon)	Density (lbs/US gallon)
Perc	0	13.47
DF-2000	0	6.42
Versatec (D-2050)	0	6.26
Stoddard Solvent	0	6.80
PureDry	0	6.71
Impress	0	9.10
Rynex	0	7.60
Drylene 800	0	6.59
EcoSolv (HC-DCF High Flash)	0	6.59
Hydroclene	0	6.59
Shell Sol 140 HT	0	6.59

**Density of dry cleaning solvents can be modified by the user**

**Figure B.1: Default density of dry cleaning solvents.**

Solvent Type	Number of Filters Disposed	Solvent per Filter (lbs/filter)
Perc	0	10.98
DF-2000	0	5.23
Versatec (D-2050)	0	5.10
Stoddard Solvent	0	5.54
PureDry	0	5.47
Impress	0	7.42
Rynex	0	6.20
Drylene 800	0	5.37
EcoSolv (HC-DCF High Flash)	0	5.37
Hydroclene	0	5.37
Shell Sol 140 HT	0	5.37

**Mass of solvent retained by the filter can be modified by the user**

**Figure B.2: Default mass of solvent retained by dry cleaning machine's filter.**

## Additional Material

Machine Type	Percentage of Solvent Transferred (%)
Converted	19.5
Primary (Spin Disk Only)	53.0
Primary (Cartridge Only)	30.2
Primary (Combo)	44.4
Primary (Average)	38.7
Secondary (Spin Disk Only)	63.7
Secondary (Cartridge Only)	51.4
Secondary (Combo)	66.3
Secondary (Average)	61.1

**Percentage of solvent transferred as sludge can be modified by the user**

**Figure B.3: Default percentage of solvent transferred as sludge.**

Contaminant	CAS #	Emission Factor (lb/1000000 ft <sup>3</sup> )			Emission Rate (kg/yr)	Data Quality	Comments
		Uncontrolled (None)	Low NOx	Low NOx Recirc.			
Sulphur Dioxide	7446-09-5	0.6	0.6	0.6	0.0	A	
Nitrogen Oxides	11104-93-1	100	50	32	3.2	C	
Carbon Monoxide	630-08-0	84	84	84	2.7	B	
Nitrous Oxide	10024-97-2	2.2	2.2	0.64	0.1	E	
Particulate Matter (PM2.5)	n/a	1.9	1.9	1.9	0.1	D	
Carbon Dioxide	124-38-9	120,000	120,000	120,000	3,844.5	A	
TOC	n/a	11	11	11	0.4	B	
Lead	7439-92-1	0.0005	0.0005	0.0005	0.0	D	
Methane	74-82-8	2.3	2.3	2.3	0.1	B	
VOC	n/a	5.5	5.5	5.5	0.2	C	



**Emission factors for natural gas combustion in these columns can be modified by the user**

**Figure B.4: Default emission factors for natural gas combustion.**

## Additional Material

Liquid Laundry Detergent		Average VOC content and density can be modified by the user
Total liquid detergent used =	6,000 litres	
Average VOC content =	28.2 % (vol)	
Average density =	1.097 kg/L	
Total VOCs used =	1,856 kg/yr	
Total VOCs released =	11.64 kg/yr	

**Figure B.5: Default average density and VOC content of liquid laundry detergent.**


### *The ChemTRAC calculator References screen*

The Reference screen describes the sources of the assumptions used on the Calculations screen. Source documents can be viewed by clicking on the links. The Reference screen also provides the definitions for 'Manufactured', 'Processed', 'Otherwise Used', and 'Released to Air'. No information needs to be entered on this screen.

Note that this tool is provided solely as an aid, and the City of Toronto makes no representation or warranty as to its applicability to your facility or to your obligation to comply with the Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423). It is the responsibility of each facility owner or operator to take the necessary steps to ensure compliance with the bylaw.



## Additional Material



Version 3.1 Last Updated: September 4, 2012 by CL & ZI

**Instructions**

**Input/Output**

**Calculations**

**References**

You are here

**References**

This page provides all the reference information for the emission factors and assumptions used in the Calculations spreadsheet. Click on the links below to view the source documents.

1. California Dry Cleaning Industry Technical Assessment Report, Air Resources Board, California Environmental Protection Agency  
<http://www.arb.ca.gov/toxics/dryclean/finaldrycleantechreport.pdf>
2. The State Coalition for Remediation of Drycleaner: Solvents used in the Dry Cleaning Sector, Table  
[http://www.drycleancoalition.org/download/solvent\\_table.pdf](http://www.drycleancoalition.org/download/solvent_table.pdf)
3. Gert Van Hoof, Diederik Schowanek and Tom CJ Feijtel (2003). Comparative Life-Cycle Assessment of Laundry Detergent Formulations in the UK. Part I: Environmental fingerprint of five detergent formulations in 2001. Strombeek-Bever, Belgium  
[http://www.scienceinthebox.com/en\\_UK/pdf/TS\\_20035PartI.PDF](http://www.scienceinthebox.com/en_UK/pdf/TS_20035PartI.PDF)
4. Emission factors and an assessment of their data quality are provided in the US EPA AP-42 "Natural Gas Combustion", Section 1.4, 1998  
<http://www.epa.gov/ttn/chieff/ap42/ch01/final/c01s04.pdf>
4. The Soap and Detergent Association "Calculation of Component Chemical Air Emission Factors for Hand Washing Detergents, Liquid Laundry Detergent, Liquid Fabric Softener", August 2007  
[http://www.aciscience.org/docs/Cleaning\\_Product\\_Air\\_Emissions\\_from\\_WWTPs\\_-\\_Exec\\_Summ.pdf](http://www.aciscience.org/docs/Cleaning_Product_Air_Emissions_from_WWTPs_-_Exec_Summ.pdf)

Average VOC content for detergents and fabric softeners were estimated using MSDSs from:  
ABC Compounding  
<http://www.abccompounding.com/abc/>  
KIK Custom Products

↓  
Etc.

### Definitions<sup>1</sup>

**Manufacture** - To produce, prepare or compound a priority substance and includes the coincidental production of a priority substance as a by-product.

**Process** - The preparation of a priority substance, after its manufacture, for commercial distribution and includes the preparation of a substance in the same physical state or chemical form as that received by the facility, or preparation which produces a change in physical state or chemical form.

**Otherwise Use** - Any use, disposal or release of a priority substance at a facility that does not fall under the definitions of "manufacture" or "process." This includes the use of the priority substance as a chemical processing aid, manufacturing aid or some other use.

**Release** - The emission or discharge of a priority substance, whether intentional, accidental or coincidental, from a facility into the environment.

<sup>1</sup> For details refer to the Environmental Reporting and Disclosure Bylaw available at the [ChemTRAC](#)



Figure B. 6: The Reference screen.

## Additional Material

### *Emission factors for dry cleaning facilities*

The ChemTRAC calculators are based on published estimates of the emissions associated with different industrial processes. These estimates are called “emission factors”. Emission factors indicate the amount of a specific substance (e.g. VOCs) emitted by a specific activity (e.g. using one litre of liquid detergent).

Tables B.1 and B.2 present the default parameters used in the dry cleaning calculator to estimate the release of dry cleaning solvent to air.

**The mass of dry cleaning solvent released to air is calculated as follows:**

**= Mass of Perc used – Mass of Perc transferred as sludge – Mass of solvent retained on filters**

**= (Mass of Perc Used) – [(Mass of Perc Used) x (% solvent transferred as sludge)] – [(Mass of solvent retained Per Filter) x (Number of filters)]**

If site-specific emission factors are available for the facility or processes, they can be entered in the Calculations sheet of the calculator.

Tables B.3 presents the default emission factors used in the dry cleaning calculator to estimate the release of priority substances from laundry activities and natural gas use.

## Additional Material

**Table B.1. Default mass of dry cleaning solvent collected per filter.**

Source	Substance	Solvent collected per filter (lbs/filter)
Dry cleaning solvent	Perc	10.98
	DF-2000	5.23
	Versatec (D-2050)	5.10
	Stoddard Solvent	5.54
	PureDry	5.47
	Impress	7.42
	Rynex	6.20
	Drylene 800	5.37
	EcoSolv (HC-DCF High Flash)	5.37
	Hydroclene	5.37

**Table B.2. Default percentage of solvent transferred as sludge**

Source	Dry cleaning machine type	Percentage of solvent transferred as sludge (%)
Dry cleaning solvent	Converted	19.5
	Primary (Spin Disk Only)	53.0
	Primary (Cartridge Only)	30.2
	Primary (Combo)	44.4
	Primary (Average)	38.7
	Secondary (Spin Disk Only)	63.7
	Secondary (Cartridge Only)	51.4
	Secondary (Combo)	66.3
	Secondary (Average)	61.1

## Additional Material

**Table B.3: Default emission factors for VOCs and NOx used in dry cleaning calculator.**

Source	Substance	Default Emission Factor	
Liquid laundry detergents	Volatile organic compounds (VOCs)	Use of VOCs	0.309 kg/L
		Release of VOCs – onsite wastewater treatment	0.056 kg/L
		Release of VOCs – offsite wastewater treatment	0.006 kg/L
Powder laundry detergents		Use of VOCs	0.237 kg/L
		Release of VOCs – onsite wastewater treatment	0.056 kg/L
		Release of VOCs – offsite wastewater treatment	0.006 kg/L
Liquid fabric softeners	Volatile organic compounds (VOCs)	Use of VOCs	0.330 kg/L
		Release of VOCs – onsite wastewater treatment	0.037 kg/L
		Release of VOCs – offsite wastewater treatment	0.002 kg/L
Natural gas combustion	Nitrogen oxides	No control	160.18 kg / 100,000 m <sup>3</sup>
		Low NOx burner	80.09 kg / 100,000 m <sup>3</sup>
		Low NOx & recirculating flue gas	51.26 kg / 100,000 m <sup>3</sup>

Example 1 on the next page illustrates how to calculate Perc emissions from a dry cleaning facility using Perc. Example 2 illustrates how to calculate VOC emissions from the sample liquid laundry detergent in Worksheet 1.

## Additional Material

### Example 1: Using emission factors to estimate Perc emissions from dry cleaning

In Worksheet 1, a sample facility uses a secondary machine with combination spin disk and cartridge filters. 200 litres of Perc were added to the machine over the course of a year and 6 filters were used. Wastewater treatment occurred offsite.

The waste service company wasn't able to supply a reasonable estimate of how much Perc was shipped by the facility. Since the facility uses a "Secondary Combo" machine, the dry cleaner estimated that 66.3% was shipped as waste sludge.

First, using the 200 litre value, the mass of the Perc used in the calendar year can be determined.

#### **Total annual mass of Perc used:**

= volume x density

= 200 L x 0.2642 US gal/ L x 13.5 lbs/US gal x 0.4536 kg/lb

**= 323 kg of Perc used**

#### **Total annual release of Perc:**

= Mass of Perc used – Mass of Perc transferred as sludge – Mass of solvent retained on filters

#### **Mass of Perc transferred as sludge:**

= (Mass of Perc used) x (% solvent transferred as sludge)

= 323 kg x 66.3% ÷ 100%

**= 214 kg of Perc transferred as sludge**

#### **Mass of solvent retained on filters**

= (Mass of solvent retained Per Filter) x (Number of filters)

= 6 Filters x 10.98 lbs/filter x 0.4536 kg/lb

**= 30 kg of Perc retained on filters**

#### **Total annual release of Perc:**

= 323 kg – 214 kg – 30 kg

**= 79 kg of Perc released to air**

## Additional Material

### Example 2: Using emission factors to estimate VOC emissions from liquid laundry detergent

In Worksheet 3, a sample facility uses 6000 L of liquid detergent over the course of a year, with onsite wastewater treatment.

The emissions factor for the use of VOCs is 0.309 kg/L. The emissions factor for the release of VOCs with onsite wastewater treatment is 0.056 kg/L.

#### **Total annual use of VOCs from liquid detergent:**

= Quantity used \* Emissions factor (kg per L)

= 6000 L \* 0.309 kg per L

**= 1,856 kg of VOCs used**

#### **Total annual release of VOCs from liquid detergent:**

= Quantity used \* Emissions factor (kg per L)

= 6000 L \* 0.056 kg per L

**= 336 kg of VOCs released to air**

## Appendix C. Combining the Dry Cleaning Calculator with other sources

Depending on your business, you may need to use more than one calculator to calculate the use and release from all processes at your facility. The "Calculation of Totals" calculator can be used to compile your data.<sup>8</sup> In this calculator, you can enter the values for each process at your facility. The calculator returns the total manufactured, processed or otherwise used amounts for the facility, by substance, and then compares it to the corresponding reporting threshold.

---

<sup>8</sup> The Calculation of Totals calculator can be found under the Totals bullet at [http://www.toronto.ca/health/chemtrac/industries/other\\_industries.htm](http://www.toronto.ca/health/chemtrac/industries/other_industries.htm)

## Additional Material

Group	Chemical Name	Quantity (kg/yr)				Quantity (kg/yr)				Totals to be compared with the threshold (kg/yr)	Mass Reporting Threshold (kg/yr)	Reportable?
		Manuf-actured	Proces-sed	Otherwise Used	Released to Air	Manuf-actured	Proces-sed	Otherwise Used	Released to Air			
A	Acetaldehyde*									0	100	No
	Acrolein*									0	100	No
	Benzene*									0	100	No
	1,3-Butadiene*									0	100	No
	Carbon tetrachloride*									0	100	No
	Chloroform (Trichloromethane)*									0	100	No
	Chromium (non-hexavalent) <sup>1</sup>									0	100	No
	1,2-Dibromoethane (Ethylene dibromide)									0	100	No
	1,4-Dichlorobenzene*									0	100	No
	1,2-Dichloroethane (Ethylene dichloride)*	Enter values from the output summary of your first calculator here				Enter values from the output summary of your second calculator here				0	100	No
	Dichloromethane (Methylene chloride)									0	100	No
	Formaldehyde*									0	100	No
	Manganese <sup>1</sup>									0	10	No
	Nickel <sup>1</sup>									0	100	No
	Tetrachloroethylene (Perchloroethylene)									0	100	No
	Trichloroethylene*									0	100	No
	Vinyl chloride									0	100	No
	Cadmium <sup>1</sup>									0	1	No
	Chromium (hexavalent) <sup>1</sup>									0	10	No
	Lead <sup>1</sup>									0	10	No
	Mercury <sup>1</sup>									0	1	No
B	Total polycyclic aromatic hydrocarbons (PAHs)*									0	10	No
	Nitrogen oxides (NOx)									0	200	No
	Particulate matter 2.5 (PM2.5)									0	30	No
C	Total Volatile organic compounds (VOCs) <sup>2</sup>									0	100	No

ETC



## Additional Material

Group	Chemical Name	Totals to be compared with the threshold (kg/yr)	Mass Reporting Threshold (kg/yr)	Reportable?	To be reported			
					Total Manufactured (kg/yr)	Total Processed (kg/yr)	Total Otherwise Used (kg/yr)	Total Released to Air (kg/yr)
A	Acetaldehyde*	0	100	No	---	---	---	---
	Acrolein*	0	100	No	---	---	---	---
	Benzene*	0	100	No	---	---	---	---
	1,3-Butadiene*	0	100	No	---	---	---	---
	Carbon tetrachloride*	0	100	No	---	---	---	---
	Chloroform (Trichloromethane)*	0	100	No	---	---	---	---
	Chromium (non-hexavalent) <sup>1</sup>	0	100	No	---	---	---	---
	1,2-Dibromoethane (Ethylene dibromide)	0	100	No	---	---	---	---
	1,4-Dichlorobenzene*	0	100	No	---	---	---	---
	1,2-Dichloroethane (Ethylene dichloride)*	0	100	No	---	---	---	---
	Dichloromethane (Methylene chloride)	0	100	No	---	---	---	---
	Formaldehyde*	0	100	No	---	---	---	---
	Manganese <sup>1</sup>	0	10	No	---	---	---	---
	Nickel <sup>1</sup>	0	100	No	---	---	---	---
	Tertrachloroethylene (Perchloroethylene)	0	100	No	---	---	---	---
	Trichloroethylene*	0	100	No	---	---	---	---
	Vinyl chloride	0	100	No	---	---	---	---
	Cadmium <sup>1</sup>	0	1	No	---	---	---	---
	Chromium (hexavalent) <sup>1</sup>	0	10	No	---	---	---	---
	Lead <sup>1</sup>	0	10	No	---	---	---	---
	Mercury <sup>1</sup>	0	1	No	---	---	---	---
B	Total polycyclic aromatic hydrocarbons (PAHs)*	0	10	No	---	---	---	---
C	Nitrogen oxides (NOx)	0	200	No	---	---	---	---
	Particulate matter 2.5 (PM2.5)	0	30	No	---	---	---	---
	Total Volatile organic compounds (VOCs) <sup>2</sup>	0	100	No	---	---	---	---

ETC

## Additional Material

The total combined use and release of substances (whether from the ChemTRAC dry cleaning calculator only, or from other substance quantification methods as well) should be compared to the mass reporting thresholds listed in Schedule A of the Environmental Reporting and Disclosure Bylaw and provided in Table C.1 below.

**Table C.1. ChemTRAC priority substances and their reporting thresholds (adapted from Schedule A of the Environmental Reporting and Disclosure bylaw)**

ChemTRAC substance	ChemTRAC Mass reporting threshold (kg/yr)	Concentration threshold <sup>b</sup> % w/w
Acetaldehyde	100	1
Acrolein	100	1
Benzene	100	1
1,3-Butadiene	100	1
Cadmium and its compounds	1	0.1
Carbon tetrachloride	100	1
Chloroform (Trichloromethane)	100	1
Chromium, Hexavalent and its compounds	10	0.1
Chromium, Non-hexavalent and its compounds	100	1
1,2-Dibromo ethane (Ethylene dibromide)	100	1
1,4-Dichlorobenzene	100	1
1,2-Dichloroethane (Ethylene dichloride)	100	1
Dichloromethane (Methylene chloride)	100	1
Formaldehyde	100	1
Lead and its compounds	10	0.1
Manganese and its compounds	10	1
Mercury and its compounds	1	0
Nickel and its compounds	100	1
Nitrogen Oxides (NO <sub>x</sub> )	200 <sup>c</sup>	N/A
Particulate Matter 2.5 (PM <sub>2.5</sub> )	30 <sup>c</sup>	N/A
Polycyclic Aromatic Hydrocarbons (PAHs)	10	N/A <sup>a</sup>
Tetrachloroethylene (Perchloroethylene)	100	1
Trichloroethylene	100	1
Vinyl chloride	100	1
Volatile Organic Compounds (VOCs) total	100 <sup>c</sup>	N/A

Notes:

- N/A = not applicable
- The concentration threshold % w/w is not relevant to the emissions quantified using the ChemTRAC calculator for Dry cleaning facilities
- Released to air

## Appendix D. Reporting Checklist

### Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423)

#### Checklist for Facilities in Toronto

Make sure the data you submit in your reports are accurate. Here is a checklist to help you.

- Enter complete facility and contact information. If you are a consultant, identify yourself as the technical contact.
- Submit a **separate** report for **each** facility in Toronto.
- Complete the statement of certification.
- Report **all** of the priority substances (chemicals) that meet or exceed (equal to or greater than) the reporting thresholds.
- Report **both use and release** amounts of all priority substances that meet or exceed the reporting thresholds.
- Estimate use and release for **all** sources and processes in your facility.
  - This includes process such as heating by natural gas combustion, welding, equipment cleaning, drilling, grinding, crushing, sanding, and blending.
- Review the exemptions in the bylaw, such as building heating, and do not include these in your calculations.
- Compare current year estimates with that of previous years (if available) and explain any differences if present.
- If you report to NPRI and there is a difference between the amount of a substance reported to ChemTRAC and NPRI, explain the reason for the difference.
- You may need to make your records available for audit purposes. Securely store the records you based your report on and document:
  - Assumptions and parameters used for calculation and estimation of emissions
  - Procedures and methods used to measure emissions
  - Calibration records of any equipment used to measure emissions

#### Use and Release Calculations

- There are many sources of information that can help you identify the priority substances in your facility. Be sure to check all of them, including:

## Additional Material

purchase records	year-end inventory	Material Safety Data Sheets (MSDS)
raw materials	Certificate of Approval or Environmental Compliance Approval	correspondence with supplier

- Use the best available method for use and release estimation. Use (if any) the most appropriate and most recent ChemTRAC calculator (available at [toronto.ca/health/chemtrac/tools.htm](http://toronto.ca/health/chemtrac/tools.htm)).
- Enter all the reportable data in kilograms (kg).
- Calculate the **total** amount of a substance used and released in **all** processes.
  - For example, process 1 used 90 kg VOC and released 75 kg. Process 2 used 60 kg VOC and released 56 kg. The total amount of use would be  $90+60=150$  kg and release  $75+56=131$  kg.
  - To help with these calculations you can use the free online ChemTRAC totals calculator.
- Double check that **decimal places** are entered in the correct place (e.g. 3.47 vs. 347)
- Check that the **total release** amount (release to land+water+air) is equal to or less than **total use** amount (manufactured+processed+otherwise used).
- Use the **average value** for use and release estimation if the substance content is listed in a range (e.g. 10-12% VOCs) on Material Data Safety Sheets or on other sources of substance data.
- The following 12 priority substances are VOCs. Be sure to report them separately **and also include** them in your VOC estimation:

Acetaldehyde	Acrolein	Benzene
1,3-Butadiene	Carbon Tetrachloride	Chloroform
1,4-Dichlorobenzene	1,2-Dichloroethane	Formaldehyde
Trichloroethylene	Vinyl chloride	Polycyclic Aromatic Hydrocarbons (PAHs)

- Consider the effects of pollution control devices (e.g. filter) in the emission calculations.
- Consider the amount of waste transferred off-site (if any) in emission calculations.

## Additional Material

**Disclaimer:** *This checklist is for information only. The City of Toronto assumes no liability for accuracy or completeness. Readers are responsible for ensuring compliance with Toronto's Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423). This information should not be relied upon as a substitute for legal or professional advice. Readers should seek their own legal or professional advice in regard to their use of the information contained in it.*