

Guide to calculations for ChemTRAC reporting:

Nut processing

Version 1.1

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Contents

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 Nut Processing, and report substances 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

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 like 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 34.

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. Nut processors are covered by this bylaw.

This guide is designed to help you:

- 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 Roasted Nut and Peanut Butter Manufacturing sector

The North American Industrial Classification System (NAICS) code 311911 is comprised of facilities engaged in salting, roasting, drying, cooking or canning nuts; processing grains or seeds into snacks; or manufacturing peanut butter.

The ChemTRAC calculator for Nut Processing is relevant to all facilities that hull and/or shell, and screen or separate nut products. This guide uses the term “nut processors” to refer to facilities in the Roasted Nut and Peanut Butter Manufacturing sector that use these processes.

The ChemTRAC calculator for Nut Processing does not calculate emissions from blanching, roasting, cooling or crushing nuts.

Nut processors are required to report their data every year if they use or release 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 nut processing facilities

Table 1 lists some of the typical processes used in a nut processing facility. Most facilities will pre-clean, hull, and screen or classify nuts. Many facilities will also shell nuts and use air legs to remove empty hulls.

Table 1 also shows that one ChemTRAC priority substance is released from these processes in a typical nut processing facility: particulate matter 2.5 (PM_{2.5}). The ChemTRAC calculator can help you estimate the levels of this substance in your facility.

Table 1. ChemTRAC substances released in a nut processing facility, and their source of release

ChemTRAC priority substances	Manufacturing processes				
	Pre-cleaning	Hulling	Shelling	Screening	Air legs
PM _{2.5}	X	X	X	X	X

Particulate Matter 2.5 (PM_{2.5}). The term “particulate matter” describes solid and liquid particles found in the air we breathe. Particulate matter that is smaller than 0.0025 millimetres in diameter is called PM_{2.5} and may not be visible to the naked eye. In a nut processing facility, PM_{2.5} is released into the air from the handling and processing of nuts.

The health effects of PM_{2.5}

PM_{2.5}. Because of their small size, PM_{2.5} can lodge deeply into the lungs. Numerous studies have linked PM to aggravated cardiac and respiratory diseases such as asthma, bronchitis and emphysema, and to 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>.

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/tools.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. See <http://www.toronto.ca/health/chemtrac/tools.htm> for a list of alternative methods.

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

Worksheets for collecting information

The worksheets found on the next pages are intended to help you collect all the information needed to use the ChemTRAC calculator for Nut Processing. Two worksheets are provided:

- Nut processing
- Screening and air legs (separators)

A printer-friendly version of the worksheets can be found as 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 Nut Processing, 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 Nut Processing. 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.

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

Worksheet 1 – Nut processing

This worksheet will help you collect information on your facility's processing of nuts. By answering the questions below and filling out the [Worksheet 1 Tables](#) on the next page, you will have all the information you need to complete the first section of the ChemTRAC calculator. You should collect data on your facility for the period from January 1 to December 31 of a calendar year.

1. What is the total annual quantity of raw material processed by your facility?

Estimate the total quantity of raw material processed, including orchard debris. You can collect information on the quantity of nut processed in: metric tonnes, kilograms, pounds, US tons, or UK tons¹.

If it is helpful, you can start by estimating the quantity processed each week or month.

*Example: 1 tonne per month * 12 months per year = 12 tonnes per year*

Enter this data into [Worksheet 1 Table 1](#) on the next page. You can enter information about different products or sources of raw material in different rows, and add them in the row at the bottom.

2. Are final products hulled only, or hulled and shelled?

Use an "X" in [Worksheet 1 Table 2](#) on the next page to indicate whether nuts are hulled only, or shelled *and* hulled in your facility.

3. What emissions control equipment is used to capture dust from pre-cleaning, hulling / shelling, and screening?

Some facilities use dust collectors to capture particulate matter from processing operations. Use an "X" in [Worksheet 1 Table 3](#) on the next page to indicate whether cyclones or baghouses are installed to collect dust from each of the processes: pre-cleaning, hulling / separating or hulling / shelling, and screening / classification.

For more information on dust collectors, see *Control Technologies for Reducing Emissions* on page 23 of this guide.

¹ The ChemTRAC calculator assumes that all nut processed is subject to solvent extraction using hexane.

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

Worksheet 1 Table 1 – Total quantity of raw material processed

Product	Quantity processed	Units
Product / source 1: _____	_____	<input type="checkbox"/> tonnes <input type="checkbox"/> kilograms (kg) <input type="checkbox"/> pounds (lb) <input type="checkbox"/> tons - UK <input type="checkbox"/> tons - US
Product / source 2: _____	_____	_____
Product / source 3: _____	_____	_____
Product / source 4: _____	_____	_____
Total annual quantity of material processed: _____		<input type="checkbox"/> tonnes <input type="checkbox"/> kilograms (kg) <input type="checkbox"/> pounds (lb) <input type="checkbox"/> tons - UK <input type="checkbox"/> tons - US

Worksheet 1 Table 2 – Hulling and shelling

Are final products hulled only, or hulled and shelled?	<input type="checkbox"/> Hulled only <input type="checkbox"/> Hulled and shelled
---	---

Worksheet 1 Table 3 – Emissions control equipment (dust collectors)

What emissions control equipment (dust collector) is used for each processing step?	
Pre-cleaning	<input type="checkbox"/> None <input type="checkbox"/> Cyclone <input type="checkbox"/> Baghouse
Hulling / separating or hulling / shelling	<input type="checkbox"/> None <input type="checkbox"/> Cyclone <input type="checkbox"/> Baghouse
Screening / classification	<input type="checkbox"/> None <input type="checkbox"/> Cyclone <input type="checkbox"/> Baghouse

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

Worksheet 2: Screening and air legs (separators)

This worksheet will help you collect information on your facility's use of screening to remove hulls and debris, and use of air legs to remove empty hulls. By answering the questions below and filling out the [Worksheet 2 Tables](#) on the next page, you will have all the information you need to complete the second section of the ChemTRAC calculator. You should collect data on your facility for the period from January 1 to December 31 of a calendar year.

4. What percent of your facility's product is screened more than once? More than twice? More than three times?

You should count product that is screened three times as being screened "more than once" *and* "more than twice". (The numbers could add up to more than 100%.)

Use this information to fill out [Worksheet 2 Table 1](#) on the next page.

For example:

If 25% is screened once, 25% is screened twice, 25% is screened three times, and 25% is screened four times, [Worksheet 2 Table 1](#) would be filled out as follows:

Sample: [Worksheet 2 Table 1 – Multiple screenings](#)

What percent of product is screened...?	
More than once? (Twice or more)	75%
More than twice? (Three times or more)	50%
More than three times? (Four times or more)	25%

5. How many air legs do you use to remove empty hulls?

In many facilities, air legs (forced air gravity separators) are used to separate hulled nuts from any remaining hull pieces.

In [Worksheet 2 Table 2](#) on the next page, indicate the number of air legs in operation at your facility. If you do not use any air legs / forced air separators to remove empty hulls, enter "0".

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Worksheet 2 Table 1 – Multiple screenings

What percent of product is screened...?	
More than once? (Twice or more)	_____ %
More than twice? (Three times or more)	_____ %
More than three times? (Four times or more)	_____ %

Worksheet 2 Table 2 – Air legs (forced air separators)

How many air legs (forced air separators) are used in your facility to remove empty hulls?	_____
---	-------

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 Nut Processing. The ChemTRAC calculator will then automatically calculate the quantities of ChemTRAC substances released from your facility. This section of the guide provides a step-by-step walkthrough of the use of the calculator.

Getting started

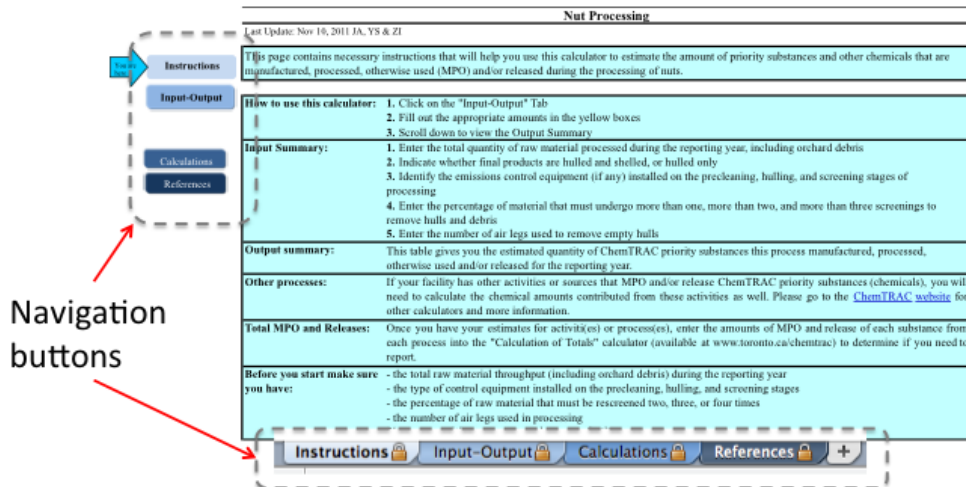
The ChemTRAC calculator for nut processors can be read with software such as Microsoft Excel or Open Office. To find a copy of the calculator, go to <http://www.toronto.ca/health/chemtrac/tools.htm> and click on the "Nut Processing" link found under the Food and Beverage Sector.

The calculator consists of four different screens:

- Instructions
- Input-Output
- Calculations
- References

You only have to enter information into the Input-Output screen. The other screens are provided in the calculator mainly for reference. No information needs to be entered in these screens.² These additional screens are discussed in Appendix C.

You can navigate between screens by clicking the buttons on the left side of each screen or by clicking on the tabs at the bottom of each screen:



² 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

The Instructions screen

The calculator should open 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 facility. It also provides a brief overview of the contents of the calculator. **You do not need to enter any information on this screen.**

The Input-Output screen

The Input-Output screen is the screen where you will enter all information applicable to your facility. Information is typed in **yellow boxes** only. Any yellow 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 and 2** of the 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.³ The values are displayed in the **Output Summary table** found at the bottom of the Input-Output screen. 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 15 for more information.

The next pages will walk you through the Input-Output screen. The image on the next page illustrates the different areas of the Input-Output screen.

³ The definitions for 'Manufactured', 'Processed', 'Otherwise Used', and 'Released to Air' can be found on the References screen of the ChemTRAC calculator.

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

Please complete the INPUT tables below.

Provide total quantity of raw material processed (including orchard debris)		tonnes/year
Are final products hulled only, or hulled and shelled?	Select	
For each of the following processing steps, please identify the type of emissions control equipment used:		
Precleaning	None	
Hulling/separating or hulling/shelling	None	
Screening/classification	None	
Percent of product that must undergo more than one screening to remove hulls and debris:		%
Percent of product that must undergo more than two screenings to remove hulls and debris:		%
Percent of product that must undergo more than three screenings to remove hulls and debris:		%
Number of air legs used to remove empty hulls		

Unit Conversion Table		
1 pounds	=	0.0004536 tonnes
1 tons (US)	=	0.90718474 tonnes
1 tons (UK)	=	1.016046909 tonnes
1 kg	=	0.001 tonnes

Use this box to convert quantity into tonnes

Enter data from Worksheet 1 here

Enter data from Worksheet 2 here

OUTPUT SUMMARY (Only ChemTRAC priority substances)				
ChemTRAC Priority Substance	Quantity (kg/yr)			
	Manufactured ¹	Processed ¹	Otherwise Used ¹	Released to Air ²
Particulate Matter 2.5 (PM 2.5)	0	0	0	0

¹ Definitions available in references

The output values are calculated here

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

Entering information from Worksheet 1: processing

The image below displays the area of the Input-Output screen where you enter information on nut handling and processing. It shows an example of information from [Worksheet 1](#) entered into the appropriate areas of the screen.

Question 1: A sample user has indicated that the facility processed a total of **20** tonnes of raw material over the year by typing this value into the yellow box.

The input box requires data in metric tonnes. If you have collected information in other units (e.g. kilograms, pounds, US tons), you should use the **Unit Conversion Table** on the right side of the Input-Output screen to convert to tonnes. This is discussed on the next page.

Question 2: A user has indicated that their facility performs hulling and shelling by selecting **“Hulled and shelled”** from the dropdown menu.

Question 3: A sample user has indicated that **“cyclone”** dust collectors are used in association with hulling / shelling, but that no emissions control equipment is used for pre-cleaning or screening/classification processes (**“none”** selected from the dropdown menu).

Provide total quantity of raw material processed (including orchard debris)	20	tonnes/year
Are final products hulled only, or hulled and shelled?	Hulled and shelled	▼
For each of the following processing steps, please identify the type of emissions control equipment used:		
Precleaning	None	▼
Hulling/separating or hulling/shelling	Cyclone	▼
Screening/classification	None	▼

Entering information from Worksheet 2: Screening and air legs

The image on the next page displays the area of the Input-Output screen where you enter information on multiple screenings and air legs (forced air separators). It shows sample information from [Worksheet 2](#) entered into the screen.

Question 4: In this example, a user has indicated that **“75%”** of products undergo more than one screening, **“50%”** undergo more than two screenings, and **“25%”** undergo more than three screenings.

Question 5: The sample user has indicated that **“3”** air legs are used to remove empty hulls by typing this value into the yellow box.

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Percent of product that must undergo more than one screening to remove hulls and debris:	75.0	%
Percent of product that must undergo more than two screenings to remove hulls and debris:	50.0	%
Percent of product that must undergo more than three screenings to remove hulls and debris:	25.0	%
Number of air legs used to remove empty hulls	3	

Unit Conversion Table

The blue and yellow unit conversion box on the right side of the calculator allows you to convert **quantity of raw material processed into metric tonnes**.

Enter the value from Worksheet 1 in the appropriate yellow box at the left of the table (in pounds, US tons, UK tons, or kilograms). The tool will automatically convert the quantity into tonnes in the blue column at the right of the table. This value can then be entered into the main areas of the input-output screen.

As an example in the image below, “**20,000**” kilograms is typed into the yellow box at the left. It is automatically converted to “**20**” tonnes, displayed in the blue box at the right of the table.

Unit Conversion Table		
1 pounds	=	0.0004536 tonnes
1 tons (US)	=	0.90718474 tonnes
1 tons (UK)	=	1.016046909 tonnes
20000 kg	=	20 tonnes

Reading the Output table

The Output table displays the quantities of ChemTRAC substances that are manufactured, processed, released, or otherwise used 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 sample screens above.

OUTPUT SUMMARY (Only ChemTRAC priority substances)				
ChemTRAC Priority Substance	Quantity (kg/yr)			
	Manufactured ¹	Processed ¹	Otherwise Used ¹	Released to Air ¹
Particulate Matter 2.5 (PM 2.5)	118	0	0	118

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 15 for more details.

Interpreting results

Compare results to thresholds. Once the amounts of ChemTRAC substances manufactured, processed, otherwise used and released to air have been calculated, you must compare these amounts to the ChemTRAC reporting thresholds listed in the Environmental Reporting and Disclosure Bylaw.⁴ These thresholds are also listed in Appendix C of this guide. Appendix C also identifies the different methods of comparing Group A, B and C ChemTRAC substances to thresholds.

Combining multiple calculation methods. Some facilities may need to add results of the ChemTRAC calculator for Nut processors 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, the values in the Output Summary table of the calculator can be compared directly to the ChemTRAC reporting thresholds. **If results exceed thresholds you must report.** The methods for comparing results to reporting thresholds are different for different groups of ChemTRAC substances. For the Nut Processing calculator, all ChemTRAC substances are “Group C” substances.

- **Group C substances:** Volatile organic compounds (VOCs), particulate matter 2.5 (PM_{2.5}) and nitrogen oxides (NO_x) are Group C substances. Reporting is only required if the substances are **released to air** at or above thresholds.

Table 2 below compares the Output Summary table from the *Using the Calculator* section to ChemTRAC thresholds.

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

Output Summary table from the ChemTRAC calculator					Comparison to ChemTRAC thresholds	
ChemTRAC Priority Substances	Manufacture d (kg/yr))	Processed (kg/yr)	Otherwise used (kg/yr)	Released to Air (kg/yr)	Reporting threshold (kg/yr)	Is reporting required?
PM _{2.5}	118	0	0	118	30	YES

In the Table 2 example, PM_{2.5} is manufactured and **released to air** above thresholds. Therefore, in this example, the release to air of PM_{2.5} would need to be reported to the ChemTRAC program.

⁴ The full by-law can be found at <http://www.toronto.ca/health/chemtrac/report.htm>.

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 Toronto City website's ChemTRAC reporting page. At the top, there is a navigation bar with 'HOME', 'CONTACT US', 'HOW DO I...?', and a search box. Below this is a secondary navigation bar with 'LIVING IN TORONTO', 'DOING BUSINESS', 'VISITING TORONTO', and 'ACCESSING CITY HALL'. The main content area is titled 'ChemTRAC - 4 Steps to Reporting' and includes the subtitle 'Reporting to the Environmental Reporting and Disclosure Bylaw (Municipal Code Chapter 423)'. A red box highlights the link 'Ready to report? ChemTRAC Online Reporting System'. A callout box with an arrow points to this link, containing the text 'Click here to access the system'. Below the link, there is a paragraph explaining the responsibility of facility owners and a link to 'Frequently Asked Questions about Reporting'. A section titled 'The following steps are provided as a guide to help you report:' contains a four-step process flow:

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

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[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 3-1-1.

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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

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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.

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ChemTRAC
You are in a secure site.

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 nut processors, this will be “31 –

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Manufacturing”. Then, you can select the appropriate 4-digit code (3119), and finally, the 6 digit code (311911).

NAICS 2-Digit:	31 - Manufacturing	▼
NAICS 4-Digit:	3119 - Other Food Mfg.	▼
NAICS 6-Digit:	311911 - Roasted Nut & Peanut Butter Mfg.	▼

Step 2. Reporting period

In Step 2, you will choose the calendar year from the dropdown menu and select “Yes” in response to the statement “I am ready to report for the year above”.

If your calculations showed you to be below the reporting threshold, you can enter "No" in response to the statement “I am ready to report for the year above” and then enter "I do not meet the threshold."

Step 3. Chemical selection

In Step 3, you will identify the ChemTRAC substances that exceed reporting thresholds for your facility. The example below illustrates the selection of Particulate Matter 2.5 (PM_{2.5}) for reporting.

<input type="checkbox"/>	11104-93-1	Nitrogen Oxides (NOx)
<input checked="" type="checkbox"/>		Particulate Matter 2.5 (PM 2.5)
<input type="checkbox"/>		Volatile Organic Compounds (VOCs) Total

Step 4. Use and release

In Step 4, you will enter information for each substance that you identified in Step 3. You will identify the appropriate row based on whether the substance was “manufactured”, “processed”, “otherwise used” and/or “released to air”. You will then enter the quantity of the substance that your facility released in kilograms, without decimal places.

Next, you will 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.

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The example on the next page illustrates how to complete Step 4 for PM_{2.5} using sample emissions data from Table 2 of this guide. In the example shown, the user has indicated that 118 kg of PM_{2.5} are “manufactured” and “released to air”.

Particulate Matter 2.5 (PM 2.5) (Reporting Threshold = 30.0 kg)	
Quantity (kg)	Estimation Method
If you used more than one method to estimate data, please choose the main one	
Manufactured: ⓘ <input type="text" value="118"/>	<input type="text" value="ChemTRAC calculator"/>
Processed: ⓘ <input type="text"/>	<input type="text" value="- Select Estimation Method From List -"/>
Otherwise Used: ⓘ <input type="text"/>	<input type="text" value="- Select Estimation Method From List -"/>
Total Use: <input type="text" value="118"/>	
Release to Air: ⓘ <input type="text" value="118"/>	<input type="text" value="ChemTRAC calculator"/>
Release to Land: ⓘ <input type="text"/>	<input type="text" value="- Select Estimation Method From List -"/>
Release to Surface Water: ⓘ <input type="text"/>	<input type="text" value="- Select Estimation Method From List -"/>
Total Release: <input type="text" value="118"/>	

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 Part 2 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 your facility's environmental impact

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 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: Keep equipment in good operating condition. Well-maintained equipment saves money, and reduces emissions.

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 dust collectors to capture emissions of PM_{2.5} from nut processing.

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 water-based biodegradable cleaners. Though not discussed in the guide, caustic or acidic cleaners emit VOCs.

Control technologies for reducing emissions

Control technologies can reduce, but not eliminate, the quantity of ChemTRAC substances that are released from nut processors. Control technologies can be used to help reduce emissions of ChemTRAC substances.

Control technologies for particulate matter

Recall that particulate matter 2.5 (PM_{2.5}) is released into the air from nut transfer, handling and processing.

Dust collectors. A dust collector (such as a cyclone or fabric filter) is a control technology that can help reduce emissions of PM_{2.5}. A dust collector takes in air with a high abundance of PM_{2.5}, collects much of the PM_{2.5}, and releases the air with a reduced amount of PM_{2.5}.

- **Cyclones.** Dust-laden gas enters at an angle and is spun rapidly. The centrifugal force throws the dust particles toward the wall of the cyclone. After striking the wall, these particles fall into a hopper located underneath. Cyclones generally achieve 90% collection efficiency for PM_{2.5}.
- **Baghouses (fabric filters).** Dust-laden gas enters the baghouse and pass through fabric bags that act as filters. Baghouses are one of the most efficient and cost effective types of dust collectors available and can achieve a collection efficiency of more than 99% for PM_{2.5}.

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

Without changing any other values entered in the Input-Output screen, select "Baghouse" as the emissions control equipment used for pre-cleaning, hulling/separating, and screening/classification. Check the new level of PM_{2.5} in the Output Summary table. It should be much lower than before.

The table below summarizes control technologies in Nut Processing facilities.

Table 3. Control technologies found in Nut processing facilities

Manufacturing process	Control technology	ChemTRAC substance being controlled	Reduction ability of the control technology
Nut handling, processing and screening	Cyclones	Particulate matter 2.5 (PM _{2.5})	Reduces PM _{2.5} emissions by about 90%
	Baghouses		Reduces PM _{2.5} emissions by about 99%

More ways to reduce costs and improve performance

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

1. **Reduce energy use.** By reducing energy use, manufacturers 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 motors and heating units with more efficient equipment
- Installing a programmable thermostat to control heating and cooling
- Purchasing a heat exchanger system to recycle wasted burner heat.

2. **Reduce water use.** Working to reduce water use can save money and provide environmental benefits. Manufacturers can do a number of things to reduce water use.

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

- Sweeping floors and machines instead of hosing them down with water
- Posting signs near sinks and hoses to encourage employees to use less water
- Purchasing high pressure, low volume cleaning equipment.
- Purchasing water sprayers with automatic shut-off nozzles.

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 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**, **free training workshops** and additional resources to help businesses create 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/assistance_program.htm and
<http://www.toronto.ca/health/chemtrac/gogreen.htm>.

Additional resources on reducing the environmental impact of nut processors include:

- Dalhousie University. 2008. Fact Sheet: Eco-Efficiency in the Food Processing Industry. http://eco-efficiency.management.dal.ca/Files/Business_Fact_Sheets/food_processing_fs.pdf
- New York State Department of Environmental Conservation. March 2001. Environmental Self-Assessment for the Food Processing Industry. <http://www.fpeac.org/poultry/EnvironmentalSelfAssessmentforFoodProcessingIndustry.pdf>
- Toronto Public Health, ChemTRAC. December 2010. Resource for Greening Food and Beverage Manufacturing: Pollution Prevention Information. www.toronto.ca/health/chemtrac/pdf/GreenFoodBev.pdf
- UNIDO. Pollution from food processing factories and environmental protection. http://www.unido.org/fileadmin/import/32129_25PollutionfromFoodProcessing.7.pdf
- US EPA. 2002. Practical Guide to Environmental Management for Small Businesses. http://www.smallbiz-enviroweb.org/Resources/smallbizfiles/EM_Guide0902.pdf

Appendices

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

Appendix A. Printer-friendly versions of the four worksheets.

Appendix B. Additional material related to the ChemTRAC calculator.

- *Descriptions of the remaining calculator screen*
- *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 ChemTRAC calculator with other sources:

How to combine the ChemTRAC calculator for Nut processors with emissions data from other sources.

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 – Nut processing

This worksheet will help you collect information on your facility's processing of nuts. By answering the questions below and filling out the [Worksheet 1 Tables](#) on the next page, you will have all the information you need to complete the first section of the ChemTRAC calculator. You should collect data on your facility for the period from January 1 to December 31 of a calendar year.

1. **What is the total annual quantity of raw material processed by your facility?**

Worksheet 1 Table 1 – Total quantity of raw material processed

Product	Quantity processed	Units
Product / source 1: _____	_____	<input type="checkbox"/> tonnes <input type="checkbox"/> kilograms (kg) <input type="checkbox"/> pounds (lb) <input type="checkbox"/> tons - UK <input type="checkbox"/> tons - US
Product / source 2: _____	_____	_____
Product / source 3: _____	_____	_____
Product / source 4: _____	_____	_____
Total annual quantity of material processed: _____		<input type="checkbox"/> tonnes <input type="checkbox"/> kilograms (kg) <input type="checkbox"/> pounds (lb) <input type="checkbox"/> tons - UK <input type="checkbox"/> tons - US

2. **Are final products hulled only, or hulled and shelled?**

Worksheet 1 Table 2 – Hulling and shelling

Are final products hulled only, or hulled and shelled?	<input type="checkbox"/> Hulled only <input type="checkbox"/> Hulled and shelled
---	---

Additional Material

3. What emissions control equipment is used to capture dust from pre-cleaning, hulling / shelling, and screening?

Some facilities use dust collectors to capture particulate matter from processing operations. Use an “X” in [Worksheet 1 Table 3](#) on the next page to indicate whether cyclones or baghouses are installed to collect dust from each of the processes: pre-cleaning, hulling / separating or hulling / shelling, and screening / classification.

[Worksheet 1 Table 3 – Emissions control equipment \(dust collectors\)](#)

What emissions control equipment (dust collector) is used for each processing step?	
Pre-cleaning	<input type="checkbox"/> None <input type="checkbox"/> Cyclone <input type="checkbox"/> Baghouse
Hulling / separating or hulling / shelling	<input type="checkbox"/> None <input type="checkbox"/> Cyclone <input type="checkbox"/> Baghouse
Screening / classification	<input type="checkbox"/> None <input type="checkbox"/> Cyclone <input type="checkbox"/> Baghouse

[Worksheet 2: Screening and air legs \(separators\)](#)

4. What percent of your facility’s product is screened more than once? More than twice? More than three times?

[Worksheet 2 Table 1 – Multiple screenings](#)

What percent of product is screened...?	
More than once? (Twice or more)	_____ %
More than twice? (Three times or more)	_____ %
More than three times? (Four times or more)	_____ %

5. How many air legs do you use to remove empty hulls?

[Worksheet 2 Table 2 – Air legs \(forced air separators\)](#)

How many air legs (forced air separators) are used in your facility to remove empty hulls?	_____
--	-------

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. However, if site-specific emission factors are known, they can be entered manually in the Calculations screen.

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

The ChemTRAC calculator Calculations screen

The Calculations screen includes the formulas used to calculate emissions using the information entered in the Input-Output screen. It lists the emission factors used to calculate emissions. It also provides a summary of other substances (that aren't ChemTRAC priority substances) manufactured, processed, used and/or released by your facility.

You do not need to enter any information on this screen. However, emission factors can be modified if site-specific information is available. Their location is identified in the illustration below.

ChemTRAC Priority Substance	CAS #	Quantity (kg/yr)			
		Manufactured	Processed	Otherwise Used	Released to Air
Particulate Matter 2.5 (PM 2.5)	n/a	7.2	0.0	0.0	7.2
Other Substances					
PM	n/a	17.1	0.0	0.0	17.1
PM10	n/a	12.0	0.0	0.0	12.0

Source	Control	Contaminant	CAS #	Emission Factor (kg/Mg) ⁽¹⁾	Emission Rate (kg/yr)	Data Quality
Unloading	n/a	PM	n/a	0.03	0.6	E
		PM10 ⁽²⁾	n/a	0.021	0.42	E
		PM2.5 ⁽³⁾	n/a	0.0126	0.252	E
Pretreating	Uncontrolled ⁽⁴⁾	PM	n/a	5.6	0.0	E
		PM10	n/a	4.8	0.0	E
		PM2.5 ⁽³⁾	n/a	2.3	0.0	E
Pretreating	Cyclone	PM	n/a	0.48	0	E
		PM10	n/a	0.41	0	E
		PM2.5 ⁽³⁾	n/a	0.20	0	E
Pretreating	Baghouse	PM	n/a	0.0684	0.2	E
		PM10	n/a	0.0675	0.2	E
		PM2.5 ⁽³⁾	n/a	0.004	0.1	E
Hulling/separating ⁽⁵⁾	Uncontrolled ⁽⁴⁾	PM	n/a	6.6	0.0	E
		PM10	n/a	4.8	0.0	E
		PM2.5 ⁽³⁾	n/a	2.8	0.0	E
Hulling/separating ⁽⁵⁾	Cyclone	PM	n/a	0.37	0	E
		PM10	n/a	0.41	0	E
		PM2.5 ⁽³⁾	n/a	0.24	0	E
Hulling/separating ⁽⁵⁾	Baghouse	PM	n/a	0.0678	0	E
		PM10	n/a	0.0665	0	E
		PM2.5 ⁽³⁾	n/a	0.003	0	E
Hulling/shelling ⁽⁶⁾	Uncontrolled ⁽⁴⁾	PM	n/a	22.1	0.0	E
		PM10	n/a	15.5	0.0	E
		PM2.5 ⁽³⁾	n/a	9.3	0.0	E
Hulling/shelling ⁽⁶⁾	Cyclone	PM ⁽²⁾	n/a	1.90	0	E
		PM10 ⁽²⁾	n/a	1.33	0	E
		PM2.5	n/a	0.80	0	E
Hulling/shelling ⁽⁶⁾	Baghouse	PM	n/a	0.026	0.52	E
		PM10 ⁽²⁾	n/a	0.018	0.364	E
		PM2.5 ⁽³⁾	n/a	0.011	0.2184	E
Classifier screen deck	Uncontrolled ⁽⁴⁾	PM	n/a	2.3	0	E
		PM10	n/a	1.9	0	E
		PM2.5 ⁽³⁾	n/a	1.0	0	E
Classifier screen deck	Cyclone	PM	n/a	0.2	0	E
		PM10	n/a	0.16	0	E
		PM2.5 ⁽³⁾	n/a	0.084	0	E
Classifier screen deck	Baghouse	PM ⁽²⁾	n/a	0.004	0.2	E
		PM10 ⁽²⁾	n/a	0.002	0.1	E
		PM2.5 ⁽³⁾	n/a	0.0015	0.1	E
Air log	n/a	PM	n/a	0.26	16	E
		PM10 ⁽²⁾	n/a	0.182	11	E
		PM2.5 ⁽³⁾	n/a	0.1092	7	E

Additional Material

You can modify the PM_{2.5} emission factors for any of the transfer, handling and processing steps. You can also modify the emission factors associated with the use of cyclones and baghouse filters for these steps. If emission factors are modified, be sure that they are entered in the appropriate units: kilograms per tonne (kg/Mg).

Other than to enter site-specific emission factors, all data, sample calculations and information presented in the Calculations screen are for reference only. They should not be modified in any way.

The ChemTRAC calculator References screen

The Reference screen identifies the sources of the emission factors and 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.

The References screen is illustrated below.

CHEMTRAC
References
Last Update: Nov 10, 2011 JA, YS & ZI

Instructions 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.

Input-Output Emission factors and an assessment of their data quality are provided in the US EPA AP-42 "Almond Processing", Section 9.10.2, 1995
<http://www.epa.gov/ttn/chieff/ap42/ch09/final/c9s10-2a.pdf>
Particulate matter size fractions are estimated using South Coast Air Quality Management District "Final -Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds", 2006
http://www.aqmd.gov/ceqa/handbook/PM2_5/finalAppA.doc

Calculations

References Emission control efficiencies are provided in Chapter 13 "Food and Agricultural Industry" of the [Air Pollution Engineering Manual](#), published by the Air & Waste Management Association in 1992.

Definitions¹

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.

¹For details refer to the Environmental Reporting and Disclosure Bylaw available at the [ChemTRAC website](#)

Additional Material

Emission factors for Nut Processing

The ChemTRAC calculators are all 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. particulate matter 2.5) emitted by a specific activity (e.g. hulling one tonne of nuts).

Table 4 lists the emission factors for *uncontrolled emissions* used in the ChemTRAC calculator. Where cyclones are used, PM_{2.5} emission factors are 8.6% of the value listed in Table 4. Where baghouses are used, PM_{2.5} emission factors are approximately 0.1% of the value listed in Table 4.

If site-specific emission factors are available for the facility or processes, they can be entered in the Calculations sheet of the calculator. This is detailed in the discussion of the calculator’s Calculations screen.

Table 4. Emission factors used in the Nut Processing ChemTRAC calculator (uncontrolled)

Source	Substance	Emission Factor ¹
Unloading	Particulate matter 2.5	0.013 kg / tonne of nut processed
Precleaning	Particulate matter 2.5	2.3 kg / tonne processed
Hulling / separating	Particulate matter 2.5	2.8 kg / tonne processed
Hulling / shelling	Particulate matter 2.5	9.3 kg / tonne processed
Screening / classification (classifier screen deck)	Particulate matter 2.5	1.0 kg / tonne processed
Air leg	Particulate matter 2.5	0.11 kg / tonne processed

1. Emission factors listed are for processes without dust collectors. To calculate emission factors where cyclones are used, multiply the value in Table 4 by 0.086. To calculate emission factors with baghouses, multiply by 0.001.

Example: Using emission factors to estimate PM_{2.5} emissions from hulling / shelling.

Table 4 shows that 9.3 kg of PM_{2.5} is emitted for every tonne of nuts hulled and shelled without any emissions control equipment.

Assume a facility without dust collectors hulls and shells 20 tonnes of nuts in 2011.

Total emissions of PM_{2.5} for 2011 from hulling / shelling

$$\begin{aligned} &= \text{Emissions per tonne of nuts} * \text{Tonnes of nuts hulled / shelled in 2011} \\ &= 9.3 \text{ kg / tonne} * 20 \text{ tonnes} \\ &= \mathbf{186 \text{ tonnes of PM}_{2.5}} \end{aligned}$$

Appendix C. Combining the Nut Processing 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.⁵ 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.

The total combined release of substances (whether from the ChemTRAC Nut processing 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 5 on the last page of the guide.

⁵ The Calculation of Totals calculator can be found under the Totals bullet at <http://www.toronto.ca/health/chemtrac/tools.htm>.

Additional Material

CHEMTRAC

Calculation of Totals

Last Update: October 21, 2011 by YS, JA, & ZJ



- This page gathers information to help you determine your facility-wide substance manufacture, process, otherwise use (MPO) and release estimates.
- For each source of priority substances, enter the process name and then provide the quantity of each substance manufactured, processed, otherwise used and released.
- In the "MPO" columns, identify whether the priority substance was Manufactured, Processed or Otherwise used. To do this you may consult the "Guide to Reporting" available at www.toronto.ca/chemtrac. The definitions are provided in the Examples tab.
- At the end of each row, you will find the facility-wide totals that need to be compared with the Mass Reporting Thresholds.
- The last 4 columns indicate the amount of each substance that you must report to the City of Toronto.

The total quantities of ChemTRAC substances that would have to be reported are listed here

Group	Chemical Name	Quantity (kg/yr)				Quantity (kg/yr)				Total Reported	Reportable?	To be reported						
		Manufactured	Processed	Otherwise Used	Released to Air	Manufactured	Processed	Otherwise Used	Released to Air			Total Manufactured (kg/yr)	Total Processed (kg/yr)	Total Otherwise Used (kg/yr)	Total Released to Air (kg/yr)			
		Process#1:				Process#2:												
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) ¹									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 ²									0	10	No	---	---	---	---		
	Nickel ¹									0	100	No	---	---	---	---		
	Tetrachloroethylene (Perchloroethylene)									0	100	No	---	---	---	---		
	Trichloroethylene*									0	100	No	---	---	---	---		
	Vinyl chloride									0	100	No	---	---	---	---		
	Cadmium ¹									0	1	No	---	---	---	---		
Chromium (hexavalent) ¹									0	10	No	---	---	---	---			
Lead ¹									0	10	No	---	---	---	---			
Mercury ¹									0	1	No	---	---	---	---			
B	Total polycyclic aromatic hydrocarbons (PAHs)*									0	10	No	---	---	---	---		
	Nitrogen oxides (NOx)									0	200	No	---	---	---	---		
C	Particulate matter 2.5 (PM2.5)									0	50	No	---	---	---	---		
	Total Volatile organic compounds (VOCs) ²									0	100	No	---	---	---	---		

Enter values from the Output Summary table of your first calculator here

Enter values from the Output Summary table of your second calculator here

Etc...

Additional Material

Table 5. 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 ^c % w/w
Group A: report if sum of quantity manufactured, processed and otherwise used exceeds thresholds		
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
Tetrachloroethylene (Perchloroethylene)	100	1
Trichloroethylene	100	1
Vinyl chloride	100	1
Group B: report if sum of quantity released, disposed and transferred exceeds thresholds		
Polycyclic Aromatic Hydrocarbons (PAHs)	10	N/A ^b
Group C: report if quantity released to air exceeds thresholds		
Nitrogen Oxides (NO _x)	200	N/A
Particulate Matter 2.5 (PM _{2.5})	30	N/A
Volatile Organic Compounds (VOCs) total	100	N/A

Notes:

- N/A = not applicable
- The concentration threshold % w/w is not relevant to the emissions quantified using the ChemTRAC calculator for Nut Processing

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

Additional Material

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:

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).
- 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 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)

Additional Material

- 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.

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