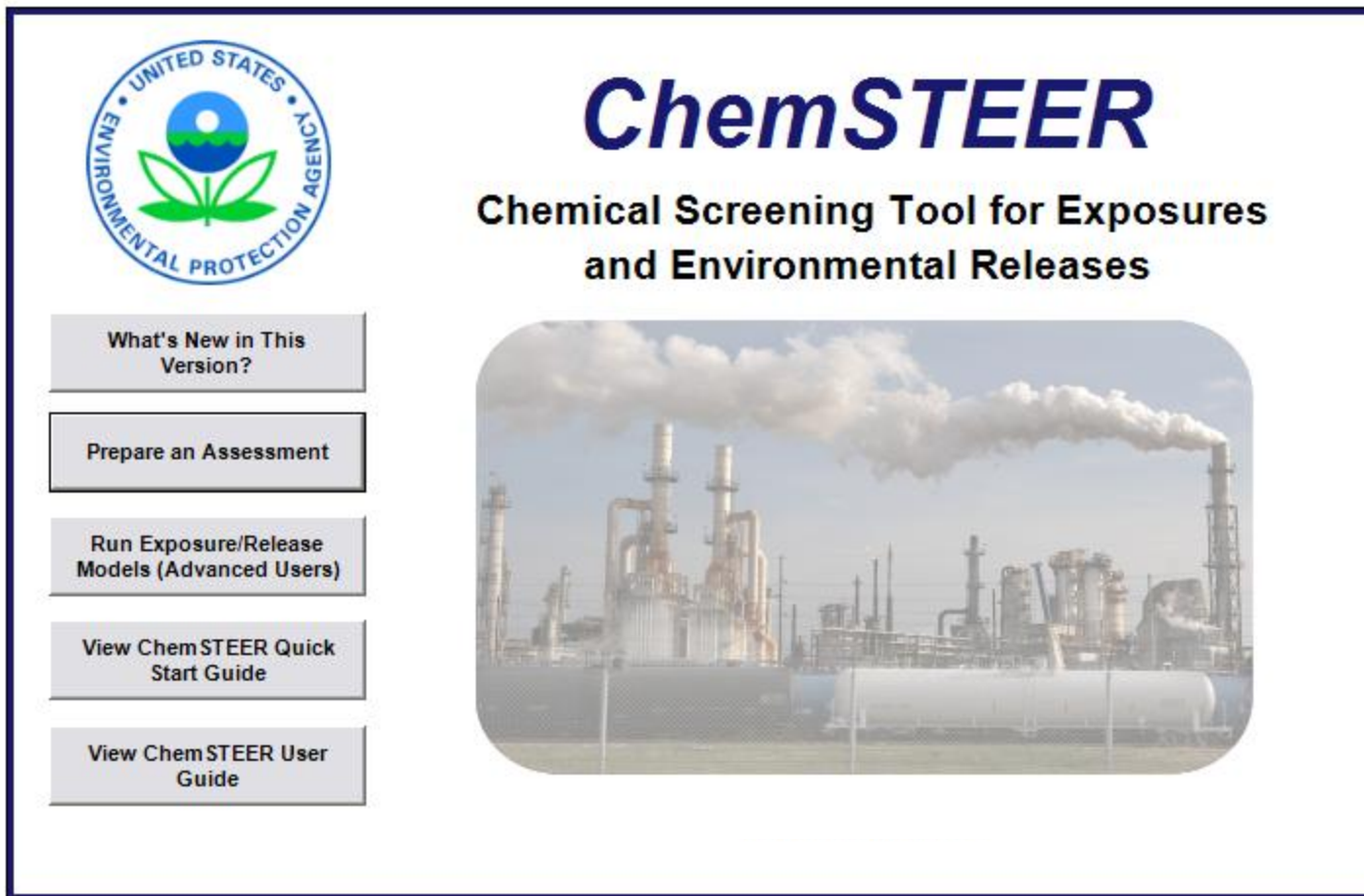



# ChemSTEER

## Quick Start Guide



The image shows a screenshot of the ChemSTEER Quick Start Guide interface. On the left side, there is a vertical navigation menu with five buttons: "What's New in This Version?", "Prepare an Assessment", "Run Exposure/Release Models (Advanced Users)", "View ChemSTEER Quick Start Guide", and "View ChemSTEER User Guide". The "View ChemSTEER Quick Start Guide" button is highlighted. On the right side, the title "ChemSTEER" is displayed in a large, bold, blue font, followed by the subtitle "Chemical Screening Tool for Exposures and Environmental Releases" in a smaller, black font. Below the subtitle is a photograph of an industrial facility with several tall smokestacks emitting thick white plumes of smoke into a clear sky. In the foreground, there is a large, white, cylindrical storage tank. The entire interface is enclosed in a dark blue border.



**ChemSTEER**  
Chemical Screening Tool for Exposures  
and Environmental Releases


What's New in This Version?

Prepare an Assessment

Run Exposure/Release Models (Advanced Users)

View ChemSTEER Quick Start Guide

View ChemSTEER User Guide



# Overview and Contents

---

- Welcome to the ChemSTEER Quick Start Guide!
- This guide is intended to provide a new, non-EPA user with an introduction to the ChemSTEER application.
- This guide discusses key information needed to complete a basic assessment, but is not meant to discuss all capabilities and functionalities of ChemSTEER. Please reference the ChemSTEER User Guide for more comprehensive information.
- Contained in this guide are brief overviews of the following main tabs and subtabs available in ChemSTEER:

1. General Information

2. Chemical Properties

3. Operations

3a. Relationships

3b. Description

3c. Physical States

3d. Sources/Activities

3e. Site Information

4. Operation Parameters

4a. Mass Balance Parameters

4b. Container Parameters

4c. Shared Parameters/Factors

5. Estimating Chemical Releases

5a. Release Input Parameters

5b. Estimated Releases

6. Estimating Chemical Exposures

6a. Dermal Model Parameters

6b. Inhalation Model Parameters

6c. Respirator Class & Monitor Review

6d. Activity Exposure Estimates

7. Optional Information

8. Reports



*To get started, open ChemSTEER and click “Prepare Assessment” on the splash screen!*

# 1. General Information

- The *General Information* tab is used to input basic assessment information.
- Key assessment identification fields (which are highlighted in the screenshot) include:
  - Assessment Type;
  - Status;
  - Fiscal Year; and
  - Assessment Identifier
- After the assessment is saved, ChemSTEER displays the case number, i.e., Fiscal Year and Assessment Identifier (ex. P99-9999) in the title bar at the top of the screen.

ChemSTEER 08/02/2013 Version, PMN13-9999

File Edit Preferences Reports Help

**1. General Information**

Click the "Update General Information" button at the bottom of the screen to add assessment information. Key case identification information includes: Assessment Type, Fiscal Year, and Assessment Identifier. Click the "Update Revision Notes/Assessment Overview" button to include key details for the IRER.

Assessment Type: PMN  
Status: CEB Staff Draft  
Fiscal Year: 13  
Assessment Identifier: 9999

Assessors:  
Name: John Smith  
Affiliation: EPA  
Phone:  
Email:

Company Name: Chemical Company  
Street Address:  
City:  
State: Zip:

Consolidated  
Date: 07/13

Revision N

**General Information Actions**

Update General Information View/Update Contact Report(s) Update Revision Notes / Assessment Overview

Multiple assessments can be saved to a single database file.

These four key elements are used together to distinguish the assessment from others saved within a common database file, similar to unique file names used within a single directory on your computer.

Click the *Update General Information* button to add or modify the General information.

## 2. Chemical Properties

- The *Chemical Properties* tab includes important information on the chemical, production volume (PV), and physical properties.
- Key fields are **highlighted in red** and include:

- Total Assessed Production Volume (PV);
- Vapor Pressure;
- Molecular Weight;
- Density; and
- Solubility in Water

It is highly recommended that you enter a value for these fields before continuing with the assessment.

ChemSTEER 08/02/2013 Version, PMN13-9999

File Edit Preferences Reports Help

**2. Chemical Properties**

Click the "Update Chemical Information" button at the bottom of the screen to add information about the chemical of interest. Parameters with **red labeling** are often important defaults used in mass balance, container, and model calculations.

Chemical Name:

Chemical Category:

Trade Name(s):

Chemical CAS Number:  Molecular Formula:

**Total Assessed Production Volume (PV):**  kg/yr

Imported Production Volume (PVi):  kg/yr

Domestic Production Volume (PVd):  kg/yr

Type of Notice:

**Vapor Pressure (VPchem):**  torr at  C

**Molecular Weight (MW):**  g/mol

**Density (Dchem):**  g/cm3 at  C

**Solubility in Water (WSchem):**

General Description of End Use(s):

Chemical Information Actions

**Update Chemical Information** View Exposure Limits

Click the **Update Chemical Information** button to add or modify the Chemical information.

# 3. Operations - Overview

- Use the *Operations* tab and each of its subtabs to build your scenario and enter necessary information about each operation in your assessment
- An operation is a workplace or set of “homogeneous” workplaces with essentially the same (or similar) processes, equipment, chemical throughputs, procedures, and worker populations, such that the releases and exposures to the chemical being assessed can be assumed similar for all of the workplaces in the set.
- Operations should first be added to the top of the screen; for each operation, you should then complete the five subtabs:
  - 3a) Relationships;
  - 3b) Description;
  - 3c) Physical States;
  - 3d) Sources/Activities; and
  - 3e) Site information.

ChemSTEER 08/02/2013 Version, PMN13-9999

File Edit Preferences Reports Help

**3. Operations**

Click the "Add / Update Operations" button below to add or remove an operation from your assessment. To view more information about an operation or modify its properties (e.g., its relationship to other operations in the assessment), select it in the list below and click on the appropriate subtab.

Manufacturing: Batch  
Use: Chemical Intermediate

Operations are listed in the top portion of the screen.

3a. Relationships    3b. Description    3c. Physical States    3d. Sources/Activities    3e. Site Information

Click the "Update Relationships" button below to update the default operations and relationships. To allow ChemSTEER to process operations, use the "Update Relationships" button below.

Subtabs 3a-3e are listed on the bottom on the screen; each subtab should be completed for each operation listed above.

Subsequent Operations:    PVop: 10,000    PVf: 100.00 %

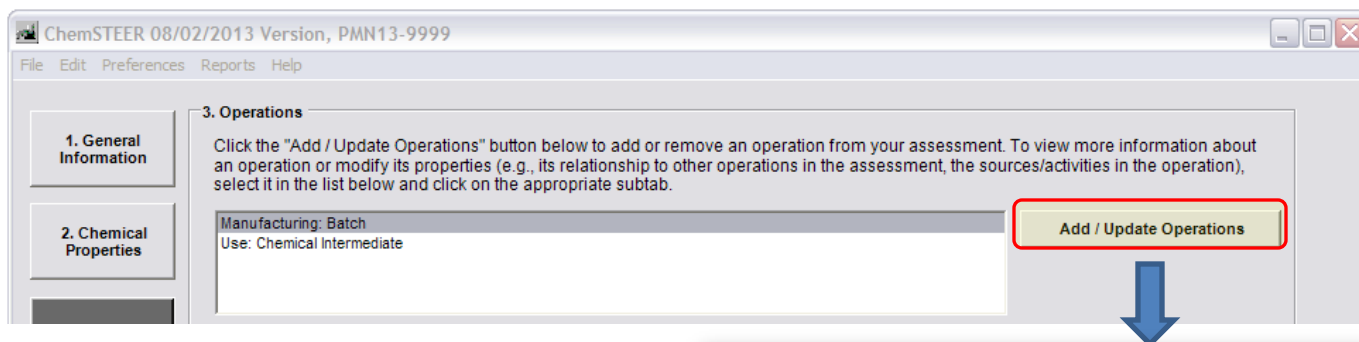
Subsequent Operation	Percent of PV	PVop (kg/yr)
Use: Chemical Intermediate	100	10,000

Operation Actions

Update Relationships

**Note:** You must add at least one operation to access the ChemSTEER release and exposure models while preparing an assessment.

### 3. Operations --> Add/Update Operations

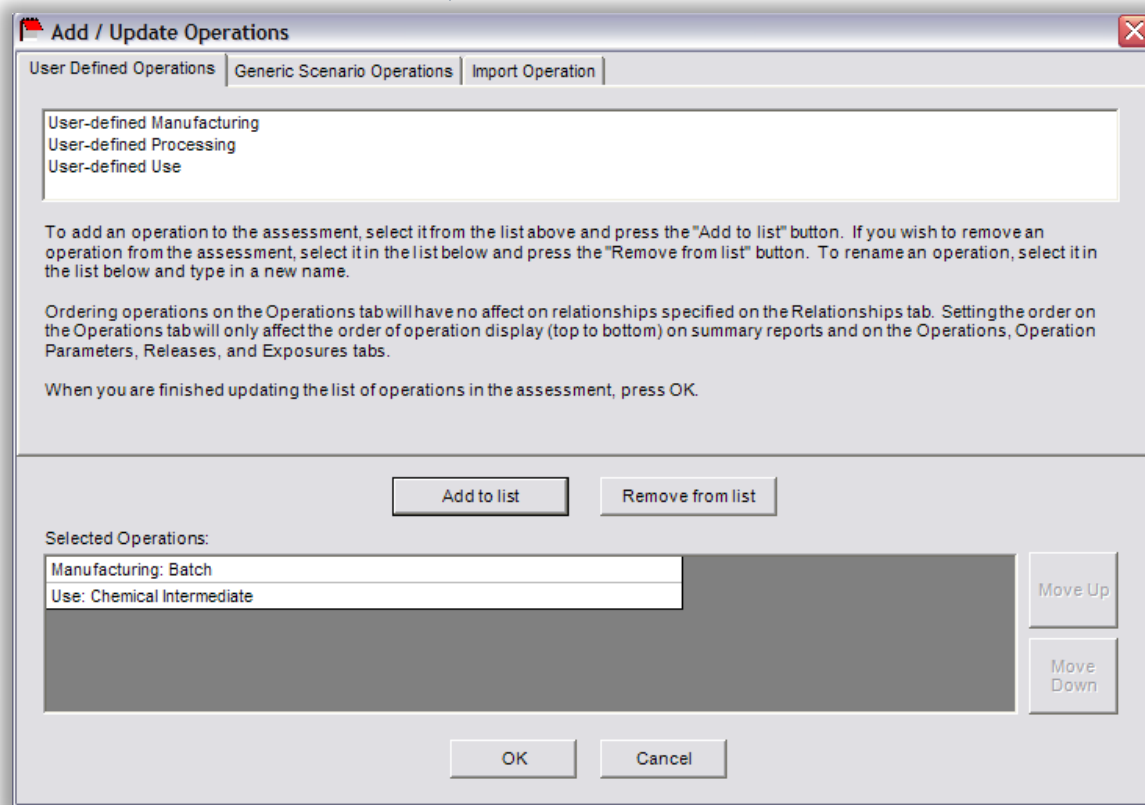


Begin by clicking the **Add/Update Operations** button to choose or define the operation(s) in your assessment.

There are three choices from which to select your operation:

- **User-defined** - These operations have no pre-defined sources/activities, mass balance parameters, or release/exposure models.
- **Generic Scenario** - These operations have been included for specific industry operations and have full or partially defined sources/activities and release and exposure models.
- **Import** - This option allows you to import operations from previously saved assessments.

*Note: This guide will review user-defined operations. Please refer to the User Guide for Generic Scenario Operations or Import previously saved operations.*



### 3. Operations --> User-defined Operations

Generally, there are three types of operations:

- **Manufacturing** - Chemical is created in this operation and thus, an assessment includes only the chemical exiting from this type of operation.
- **Processing** - Chemical both enters into and exits from this type of operation; example: chemical is received by a formulator and mixed into another product for distribution.
- **Use** - Final use of the chemical and thus, an assessment includes only the chemical entering into this type of operation; the chemical either is converted into another chemical, is incorporated into an article, or is primarily disposed as waste.

To select an operation, you may either double-click on it or click it once and then click the **Add to list** button.

**Add / Update Operations**

User Defined Operations | Generic Scenario Operations | Import Operation

User-defined Manufacturing  
User-defined Processing  
User-defined Use

The three main types of operations are available as user-defined operations at the top of the screen.

To add an operation to the assessment, select it from the list above and press the "Add to list" button. If you wish to remove an operation from the assessment, select it in the list below and press the "Remove from list" button. To rename an operation, select it in the list below and type in a new name.

Ordering operations on the Operations tab will have no affect on relationships specified on the Relationships tab. Setting the order on the Operations tab will only affect the order of operation display (top to bottom) on summary reports and on the Operations, Operation Parameters, Releases, and Exposures tabs.

When you are finished updating the list of operations in the assessment

Add to list

Selected Operations:

Manufacturing: Batch  
Use: Chemical Intermediate

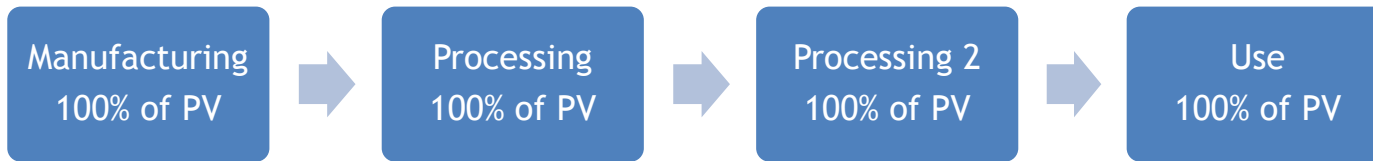
OK

**Renaming Operations**

- It is helpful to rename the operations to better describe your assessment.
- To do this, select the operation by clicking on it in the *Selected Operations* list and enter the new name.
- These operations were renamed to *Manufacturing: Batch*, and *Use: Chemical Intermediate*.

## 3a. Operations → Relationships

- The next step in building your assessment scenario is to indicate the relationships of your chosen operations (i.e., the order in which they are performed).
- As a default, ChemSTEER will define the relationships in a straight series relationship as follows (in the order that the operations were added):



**3. Operations**

Click the "Add / Update Operations" button below to add or remove an operation from your assessment. To view more information about an operation or modify its properties (e.g., its relationship to other operations in the assessment, the sources/activities in the operation), select it in the list below and click on the appropriate subtab.

Manufacturing: Batch  
Use: Chemical Intermediate

In this example, the *Manufacturing: Batch* operation is selected in the Operations box.

**3a. Relationships**    3b. Description    3c. Physical States    3d. Sources/Activities    3e. Site Information

Click the "Update Relationships" button below to modify subsequent operations and distribute the PV between multiple operations. By default, operations are linked in the order that the operations are added at the top of the page. Select the operations in order from first to last to allow ChemSTEER to automatically distribute the assessed volume properly (e.g. manufacturing first, then processing1, processing2, ..., use1, use2,...). The relationships should be updated if this order is changed.

Subsequent Operations:                      PVop: 10,000

Subsequent Operation	Percent of PV	PVop (kg/yr)
Use: Chemical Intermediate	100	10,000

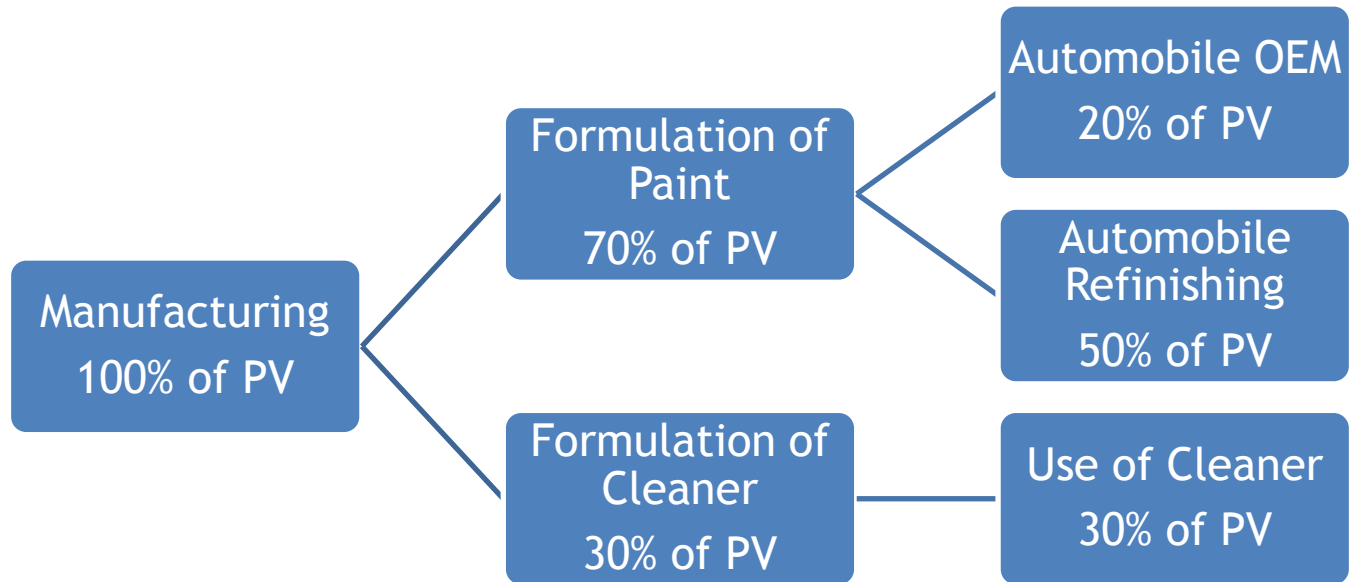
The Subsequent Operation in the Relationships subtab is *Use: Chemical Intermediate*, and is associated with 100% of the PV.



## 3a. Operations → Relationships (continued)

However, you may also rearrange your operations in ChemSTEER into any desired configuration.

For example:



Please review the User Guide on how to perform more complex relationships.

## 3b. Operations → Description

The *Description* subtab allows the user to record NAICS Code, related description information, and process description for the operation.

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1. General Information

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6. Estimating Chemical Exposures

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8. Reports

3. Operations

Click the "Add / Update Operations" button below to add or remove an operation from your assessment. To view more information about an operation or modify its properties (e.g., its relationship to other operations in the assessment, the sources/activities in the operation), select it in the list below and click on the appropriate subtab.

Manufacturing: Batch  
Use: Chemical Intermediate

3a. Relationships 3b. Description 3c. Physical States 3d.

Click the "Update NAICS and Description" button below to add relevant NAICS codes and information includes the physical form and concentration at the beginning and end of the

NAICS	Description

Process Description:  
Raw materials are charged to reactor --> Heating to 50 degrees C and mixing --> Product is filtered

Operation Actions

Update NAICS and Description

Update Operation Description

Manufacturing: Batch

Add or update the NAICS code(s) and/or process description for the operation. Press OK when you are finished.

NAICS codes associated with the operation

NAICS	Description

Add / Remove NAICS

Process Description:  
Raw materials are charged to reactor --> Heating to 50 degrees C and mixing --> Product is filtered --> Packaging in drums (liquid, 100%)

Click the **Update NAICS and Description** button to update the Description subtab

Process descriptions, including physical form and concentration at the beginning and end of the operation, are particularly important in determining a complete set of sources/activities to assess.

## 3c. Operations → Physical States

The *Physical States* subtab allows the user to record physical states for the operation.

The screenshot shows the ChemSTEER software interface. The window title is "ChemSTEER 08/02/2013 Version, PMN13-9999". The menu bar includes "File", "Edit", "Preferences", "Reports", and "Help". On the left, there is a vertical navigation pane with buttons for "1. General Information", "2. Chemical Properties", "3. Operations" (which is highlighted), "4. Operation Parameters", "5. Estimating Chemical Releases", "6. Estimating Chemical Exposures", "7. Optional Information", and "8. Reports".

The main content area is titled "3. Operations" and contains the following text: "Click the 'Add / Update Operations' button below to add or remove an operation from your assessment. To view more information about an operation or modify its properties (e.g., its relationship to other operations in the assessment, the sources/activities in the operation), select it in the list below and click on the appropriate subtab." Below this text is a text box containing "Manufacturing: Batch" and "Use: Chemical Intermediate", with an "Add / Update Operations" button to its right.

Below the text box are five subtab buttons: "3a. Relationships", "3b. Description", "3c. Physical States" (which is selected), "3d. Sources/Activities", and "3e. Site Information".

Below the subtabs is the text: "Click the 'Update Physical States' button below to specify the physical form during various stages of the operation." Below this text is a table with two columns: "Physical State" and "Other Information".

	Physical State	Other Information
Chemical into the Operation:	<input type="text"/>	<input type="text"/>
Chemical out of the Operation:	<input type="text"/>	<input type="text"/>
Chemical in the Operation:	<input type="text"/>	<input type="text"/>

At the bottom of the main content area is the "Operation Actions" section, which contains an "Update Physical State" button.

**Note:** This subtab currently does not have additional functionality and is for informational purposes only.

## 3d. Operations → Sources/Activities

- In ChemSTEER, the term *Source/Activity* refers to sources and activities in an operation that can/do/will cause releases to the environment and/or worker exposures. Most Sources/Activities have one or more default models that ChemSTEER uses to estimate releases and exposures. Choosing appropriate Sources/Activities allows you to access the models to make these estimates.
- For each operation of the assessment, you must select at least one release source or worker activity for which ChemSTEER will calculate releases and/or exposures.

***This selection is critical,*** as it will determine which default release/exposure models are used for the calculations.

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File Edit Preferences Reports Help

3. Operations

Click the "Add / Update Operations" button below to add or remove an operation from your assessment. To view more information about an operation or modify its properties (e.g., its relationship to other operations in the assessment, the sources/activities in the operation), select it in the list below and click on the appropriate subtab.

Manufacturing: Batch  
Use: Chemical Intermediate

Add / Update Operations

3a. Relationships 3b. Description 3c. Physical States **3d. Sources/Activities** 3e. Site Information

Click the "Update Sources/Activities" button below to add potential SOURCES of chemical release and worker ACTIVITIES associated with exposures within the selected operation. SOURCES and ACTIVITIES are shown below with their current default model processing (DMP) status.

Activity	Release	Exposure	Release DMP	Exposure DMP	Order
Equipment Cleaning Losses of Liquids from a Single, Large V	Yes	No	No Cond Models Addec	Pending	1
Loading Liquid Product into Drums	No	Yes	Pending	No Cond Models Addec	2

Operation Actions

Update Sources/Activities

See next page...

Click the **Update Sources/Activities** button to update.

### 3d. Operations → Sources/Activities (continued)

Clicking on the *Update Source/Activities* button opens the selection screen:

Sources/Activities are listed in categories in the upper list. To show or hide the list of specific sources/activities, double-click on the category.

Select the source/activity by either double-clicking it or clicking it once and then clicking the **Add to operation** button.

Update Operation Sources/Activities

Selected Operation: Manufacturing: Batch

Double-click on the category of interest in the following list to view/ hide available sources/ activities:

- Cleaning Liquid Residuals from Transport Containers/ Vessels
- Cleaning Solid Residuals from Transport Containers/ Vessels
- Coating Applications
- Equipment Cleaning Losses of Liquids
- Equipment Cleaning Losses of Solids
- Loading Liquids into Transport Containers/ Vessels
- Loading Solids into Transport Containers/ Vessels
- Miscellaneous Sources/ Activities
- Sampling Liquids
- Sampling Solids
- Unit Operations and Processes
- Unloading Liquids from Transport Containers/ Vessels
- Unloading Solids from Transport Containers/ Vessels

Add to operation

Remove from operation

Select sources/activities from the list above in order to include them in the current operation. You can rename a selected source/activity by clicking on it in the list below and typing in a new name. Be sure to set the Release column to "Yes" if the exposure model requires a vapor generation rate (G). For more information about adding, removing, or ordering sources/activities, or for more information about the default model processing (DMP) status, read the "Purpose and Use of the Sources/Activities Subtab" topic of the Help System.

When you are finished updating the sources/activities in the operation, press OK.

Sources/Activities that will be assessed in the operation:

Activity	Release	Exposure	Release DMP	Exposure DMP	Order
Equipment Cleaning Losses of Liquids from a Single, Large V	Yes	No	No Cond Models Addec	Pending	1
Loading Liquid Product into Drums	No	Yes	Pending	No Cond Models Addec	2

To the right of the source/activity are two columns that typically indicate whether default release and/or exposure models will be activated. To change either of these settings, simply click on the field in the column and type 'Y' (Yes) or 'N' (No).

## 3e. Operations → Site Information

On the *Site Information* subtab, you may enter information regarding the facility or facilities performing the operations of the assessment.

The screenshot displays the ChemSTEER software interface. The main window is titled 'ChemSTEER 08/02/2013 Version, PMN13-9999'. The '3. Operations' subtab is active, showing a list of operations. A dialog box titled 'Update the operation's site information' is open, allowing the user to enter facility details. The dialog box includes a 'Facilities' list with 'Manufacturing Site' selected, and fields for Facility, Address, City, State, Zip, and County. The 'Update Site Information' button in the main window is highlighted with a red box, and a blue arrow points from it to the dialog box.

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File Edit Preferences Reports Help

1. General Information

2. Chemical Properties

3. Operations

4. Operation Parameters

5. Estimating Chemical Releases

6. Estimating Chemical Exposures

7. Optional Information

8. Reports

3. Operations

Click the "Add / Update Operations" button below to add or remove an operation from your assessment. To view more information about an operation or modify its properties (e.g., its relationship to other operations in the assessment, the sources/activities in the operation) select it in the list below and click on the appropriate button.

Manufacturing: Batch  
Use: Chemical Intermediate

3a. Relationships 3b. Description

Click the "Update Site Information" button to automatically copy the sites from the preceding operation.

Operation Site Information:

Facility Name	Address
Manufacturing Site	1234 Main Street

Operation Actions

Update Site Information Copy Previous Operation

Update the operation's site information

Click on a Facility Name in the list of facilities to see the address. Use the "Add", "Modify", and "Delete" buttons to update the information.

Facilities

Manufacturing Site

Add

Modify

Delete

Facility: Manufacturing Site

Address: 1234 Main Street

City: Anywhere

State: AK Zip: 99999

County:

Close

Click the **Update Site Information** button to input facility information. If the selected operation is performed at the same facility (or facilities) as the preceding operation, you may wish to copy all of the site information that was entered for the preceding operation. To do this, click the **Copy Previous Operation** button.

## 4. Operation Parameters - Overview

- The *Operation Parameters* tab includes key mass balance and container-related parameters for each of the assessed operations.
- These key parameters may be used in generating default values for parameters used in models for release and exposure estimation.
- For each operation, you should complete the three subtabs:
  - 4a) Mass Balance Parameters;
  - 4b) Container Parameters; and
  - 4c) Shared Parameters / Factors

The layout is similar to the Operations Tab:

Operations are listed in the top portion of the screen.

Subtabs 4a-4c are listed on the bottom on the screen; each subtab should be completed for each operation listed above.

Parameter	Type	Value
BMlchem: Batch Mass Input of Chemical	Default	0
BMOchem: Batch Mass Output of Chemical	Default	40
BMlrm: Batch Mass Input of Raw Material	Default	0
BMOprod: Batch Mass Output of Product	Default	40
NS: Number of Sites	User Specified	1
Nby: Total batches/site-year	User Specified	250
Yrm: Weight Fraction of Chemical in Raw Material	Default	0
Yprod: Weight Fraction of Chemical in Product	User Specified	1
HB: Hours per batch	User Specified	24
ODmax: Maximum number of operating days	User Specified	365
Nbld: Number of batches per line per day	Default	1.0
l s: Lines per site	Default	1

## 4a. Operation Parameters → Mass Balance Parameters

You can use the *Mass Balance Parameters* subtab to view and/or update key mass balance parameters for each of the assessed operations. These key mass balance parameters are used frequently in generating default values for parameters used in models for release and exposure estimation.

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File Edit Preferences Reports Help

1. General Information

2. Chemical Properties

3. Operations

4. Operation Parameters

5. Estimating Chemical Releases

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4. Operation Parameters

Select an operation below to change/update the mass balance parameters, container parameters, or shared parameters/factors.

Manufacturing: Batch  
Use: Chemical Intermediate

4a. Mass Balance Parameters    4b. Container Parameters    4c. Shared Parameters / Factors

Click the 'Update Parameters' button below to establish the type of operation (batch or continuous) and to specify the general mass balance parameters (number of sites, throughput of chemical, etc.).

Note that these MUST be specified to perform release and exposure estimates.

Parameter	Type	Value
BMlchem: Batch Mass Input of Chemical	Default	0
BMOchem: Batch Mass Output of Chemical	Default	40
BMlrm: Batch Mass Input of Raw Material	Default	0
BMOprod: Batch Mass Output of Product	Default	40
NS: Number of Sites	User Specified	1
Nby: Total batches/site-year	User Specified	250
Yrm: Weight Fraction of Chemical in Raw Material	Default	0
Yprod: Weight Fraction of Chemical in Product	User Specified	1
HB: Hours per batch	User Specified	24
ODmax: Maximum number of operating days	User Specified	365
Nbld: Number of batches per line per day	Default	1.0
l s: Lines per site	Default	1

Operation Parameter Actions

Update Parameters

Click the *Update Parameters* button to update the Mass Balance Parameters

There are three *Mass Balance Parameters* sub-screens, which are discussed on the following pages:

- Mass Basis Selection;
- Specify mass Balance/Input Parameters; and
- Specify Other Batch Parameters



## 4a. Operation Parameters → Mass Balance Parameters (Mass Balance Selection)

On the *Mass Balance Basis Selection* subtab, you must first determine how ChemSTEER will perform calculations:

- Continuous or batch operation; or
- Raw material or product basis.

The screenshot shows a dialog box titled "Update Operation Mass Accounting Parameters" with a close button (X) in the top right corner. The subtab is "Manufacturing: Batch". There are three tabs: "Mass Balance Basis Selection" (selected), "Specify Mass Balance Input Parameters", and "Specify Other Batch Parameters".

Under "Mass Balance Basis Selection", the text reads: "Select type of operation and whether to use raw material or product". Below this, it says "This operation has a PVop of: 10,000 kg/yr".

Next, it asks: "Please specify whether this operation is continuous or batch". There are two radio buttons: "Continuous operation" (unselected) and "Batch Operation" (selected). A blue arrow points from the "Batch Operation" radio button to a callout box.

Below that, it asks: "Please specify whether you want to use the operation's raw material or product as the basis for calculations." There are two radio buttons: "Raw Material" (unselected) and "Product" (selected). A blue arrow points from the "Product" radio button to another callout box.

At the bottom of the dialog box are four buttons: "OK", "Cancel", "Basis", and "Help".

The first callout box (pointing to "Batch Operation") contains the following text:

- Continuous processes generally have continuous feed of raw materials and output of product.
- Batch processes generally have discontinuous feed of raw materials and output of product.

The second callout box (pointing to "Product") contains the following text:

- Raw material basis causes ChemSTEER to utilize the current settings for the chemical as it enters the selected operation (e.g., utilizing the settings for the chemical exiting the previous operation in a series).
- Product basis causes ChemSTEER to utilize the current settings for the chemical as it exits the selected operation.

**Note:** the available options will vary, depending on whether you selected a Manufacturing, Processing, or Use operation on the *Operations* tab.

## 4a. Operation Parameters → Mass Balance Parameters (Specify Mass Balance Input Parameters)

On the *Specify Mass Input Parameters* subtab, you must enter parameters that ChemSTEER uses to calculate the remaining mass balance parameters. **These values are required to calculate release and exposure estimates.**

Follow the instructions at the top of the screen to choose 3 of the 5 parameters.

Click the **Calculating remaining two parameters** button to have ChemSTEER automatically determine the remaining parameters.

The screenshot shows a dialog box titled "Update Operation Mass Accounting Parameters" with a close button (X) in the top right corner. The "Manufacturing: Batch" section is active, and the "Specify Mass Balance Input Parameters" subtab is selected. The dialog contains the following elements:

- Instructions:** "Please specify exactly three of the first five parameters, including at least one parameter from the first 'pair' and at least one parameter from the second 'pair.' ChemSTEER will calculate the other two parameters for you. If you only need a smaller subset of these parameters for use in a limited set of models, enter only those parameters and ChemSTEER will not derive a complete set of default values."
- Batch Operation; Using Product:**
  - Pair 1:**
    - NS: Number of Sites (value: 1, Calc button)
    - Nby: Total batches/site-year (value: 250)
  - Pair 2:**
    - Yprod: Weight Fraction of Chemical in Product (unitless) (value: 1, Default button)
    - BMOprod: Batch Mass Output of Product kg/site-batch (value: 40, Calc button)
    - BMOchem: Batch Mass Output of Chemical kg/site-batch (value: 40, Calc button)
- Buttons:** "Calculate remaining two parameters" (highlighted with a red box and a blue arrow), "Restore Defaults"
- Batch Raw Material Parameters Calculation:**
  - Instructions: "If appropriate, you may change one or two of the following three parameters and press the 'Recalc' button for the parameter you wish to have ChemSTEER recalculate. Once you have changed one of these parameters, you must press a 'Recalc' button before you close this window."
  - Yrm: Weight Fraction of Chemical in Raw Material (unitless) (value: 0, Recalc button)
  - BMlrm: Batch Mass Input of Raw Material kg/site-batch (value: 0, Recalc button)
  - BMlchem: Batch Mass Input of Chemical kg/site-batch (value: 0, Recalc button)
  - Button: "Calculate defaults"
- Footer Buttons:** "OK", "Cancel", "Basis", "Help"

**Note:** The specific parameters that are displayed on this subtab are determined by which combination of Continuous/ Batch and Raw Material/ Product bases was chosen in the *Mass Balance Basis Selection* subtab.

## 4a. Operation Parameters → Mass Balance Parameters (Specify Other Batch Parameters)

On the *Specify Other Batch Parameters* subtab, you may modify any parameters shown in the screen. This screen is used for *Batch* operations only. You cannot access this tab until a value for at least the Nby parameter (number of batches per site, per year) has been entered or calculated in the Specify Mass Balance Input Parameters subtab for *Batch* operations.

The screenshot shows a dialog box titled "Update Operation Mass Accounting Parameters" with a close button (X) in the top right corner. The dialog is divided into two main sections: "Batch Frequency Parameters" and "Daily Batch Parameters Calculation".

**Batch Frequency Parameters**

If appropriate, you may change one or both of the following two changeable parameters and ChemSTEER will recalculate the Daily Batch Parameters below.

Nby: Number of batches/site-year (read-only)	250
HB: Hours per batch	24
ODmax: Maximum possible operating days per year	365

**Daily Batch Parameters Calculation**

If appropriate, you may change one or two of the following three changeable parameters and press the 'Recalc' button for the parameter you wish to have ChemSTEER recalculate. These parameters' values are limited by the values in the Batch Frequency Parameters box above.

<input type="checkbox"/> Nbid: Number of batches per line per day	1	Recalc
<input type="checkbox"/> Ls: Processing lines per site	1	Recalc
<input type="checkbox"/> OD: Operating days per year	250	Recalc

Nbd: Number of batches/site-day (Nbid x Ls) 1

Calculate Defaults

OK Cancel Basis Help

**Note:** Modifying values on this screen is optional.

ChemSTEER is programmed to automatically calculate values based on the information provided on the "Specify Mass Balance Input Parameters" tab.

## 4b. Operation Parameters → Container Parameters

The *Container Parameters* subtab allows you to verify and/or edit the default settings for how the mass balance around loading and unloading containers with materials containing the chemical.

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4. Operation Parameters

Select an operation below to change/update the mass balance parameters, container parameters, or shared parameters/factors.

Manufacturing: Batch  
Use: Chemical Intermediate

4a. Mass Balance Parameters | **4b. Container Parameters** | 4c. Shared Parameters / Factors

Select the appropriate subtab below and click the 'Update Container Parameters' to specify the container size, fraction of total volume shipped in each type of container, unloading/loading rate, etc.

For Raw Material | For Product | For Other Material | Container Parameters

Yrm = 0      Sum of Fc = 0

Source/ Activity Name	fc: fraction of rm shipped in this container type (default: 1/(# of CR activities for rm))	Vc

Operation Parameter Actions

Update Container Parameters

**Note:** Depending on the sources/activities selected on the Operations tab, corresponding container sizes and unloading/loading rates are automatically populated as shown in the table below. Therefore, you will not have to make any changes in most cases.\*

**Default Container Sizes and Unloading / Loading Rates Programmed in ChemSTEER**

Vessel Name	Default Volume (Vc), [gal]	Default Container Unload/Load Rate (r), [containers/hr]
Bottles	1	60
Small Containers	5	60
Drums	55	20
Totes	550	20
Tank Trucks	5,000	2
Rail Cars	20,000	1
Containers*	none	none
Transport/Storage Vessels (User-defined)	none	none

\* Sources/activities related to the Loading or Unloading of Solids into/from Transport Containers/Vessels do not have default container sizes populated; therefore, you must specify a container size on subtab 4b before continuing.

## 4c. Operation Parameters → Shared Parameters/Factors (for Advanced Users Only)

The *Shared Parameters/Factors* subtab contains parameters for a particular operation that are used by more than one model for a particular source/activity (e.g., vapor pressure correction factor used by both the release model and exposure model).

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4. Operation Parameters

Select an operation below to change/update the mass balance parameters, container parameters, or shared parameters/factors.

Manufacturing: Batch  
Use: Chemical Intermediate

4a. Mass Balance Parameters    4b. Container Parameters    4c. Shared Parameters / Factors

Click the 'Update AVP Range' button below to specify the VP range for which ChemSTEER will automatically include air release or inhalation exposure models.

Click the "Update Available Shared Parameters/Factors" button below or double click on the row to view/select options for changing the current values.

AVPlow: 0.001    Update AVP Range  
AVPhigh: 35

Group	Parameter/Factor	Type	Value	Units
-------	------------------	------	-------	-------

Operation Parameter Actions

Update Available Shared Parameters/Factors

**Note:** All shared parameters are programmed with default values, which will provide the most conservative results.

Therefore, the user may run models without entering/performing calculations under this subtab.

In most cases, you will not need to modify these default values.

# 5. Estimating Chemical Releases

You can use the *Estimating Chemical Releases* tab to view, update, and run the model(s) used to calculate the releases for each of the operations' sources/activities.

In this tab you may:

- View and/or update which models are used
- View/update the specific model-related parameters
- View the model results (estimated releases)

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**5. Estimating Chemical Releases**

Select the desired operation, source, and release model for more detailed information.

Operation: Manufacturing: Batch Release Model(s): EPA/OPPT Single Process Vessel Residual Model

Source: (1) Equipment Cleaning Losses of Liquids from a Single, Large Vessel

**5a. Release Input Parameters**      **5b. Estimated Releases**

Use the buttons below to add, remove, or update release models, or add notes to the release summary. When complete, click the 'Run Model(s)' button below to generate the results. Results are shown on the Estimated Releases tab (5b).

Model Status: Model was successfully run

Parameter	Type Conservative	Origin Conservative	Value Conservative	Units
Amt: Amount to Use	Default	BMOchem x	40	kg/site-day
Freq: Frequency to Use	Default	OD	250	days/site-yr
LF: Loss Fraction	Default	Model Parm	0.01	dimensionless
NS: Number of Sites	Default	Mass Parm	1	sites

Chemical Release Model Actions

Add or Remove Release model    View/Update Model Information    Modify Media of Release    Introductory Notes for the Release Summary    Additional Notes for the Release Summary    Run Model(s)

Select the operation, release source, and release model at the top of the screen.

For the operation/source/release model selected above, subtab 5a shows the model parameters and subtab 5b shows the estimated releases.

ChemSTEER currently contains 18 different models that can be used to calculate releases, each with their own set of default settings and values.

# 5a. Releases → Release Input Parameters

On the Release Input Parameters subtab, there are a number of options for working the release models, which are discussed on the following pages:

- Add/Remove Release Model
- View/Update Model Information
- Modify Media of Release
- Introductory Notes for Release Summary
- Additional Notes for Release Summary
- Run Model(s)

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File Edit Preferences Reports Help

**5. Estimating Chemical Releases**

Select the desired operation, source, and release model below. Read the "Estimating Chemical Releases Tab" to the User Guide for more detailed information.

Operation: Manufacturing: Batch Release Model(s): EPA/OPPT Single Process Vessel Residual Model

Source: (1) Equipment Cleaning Losses of Liquids from a Single, Large Vessel

**5a. Release Input Parameters** | 5b. Estimated Releases

Use the buttons below to add, remove, or update release models, or add notes to the release summary. When complete, click the 'Run Model(s)' button below to generate the results. Results are shown on the Estimated Releases tab.

Model Status: Model was successfully run

Parameter	Type Conservative	Origin Conservative	Value Conservative	Units
Amt: Amount to Use	Default	BMOchem x	40	kg/site-day
Freq: Frequency to Use	Default	OD	250	days/site-yr
LF: Loss Fraction	Default	Model Parm	0.01	dimensionless
NS: Number of Sites	Default	Mass Parm	1	sites

**Chemical Release Model Actions**

Add or Remove Release model | View/Update Model Information | Modify Media of Release | Introductory Notes for the Release Summary | Additional Notes for the Release Summary | Run Model(s)

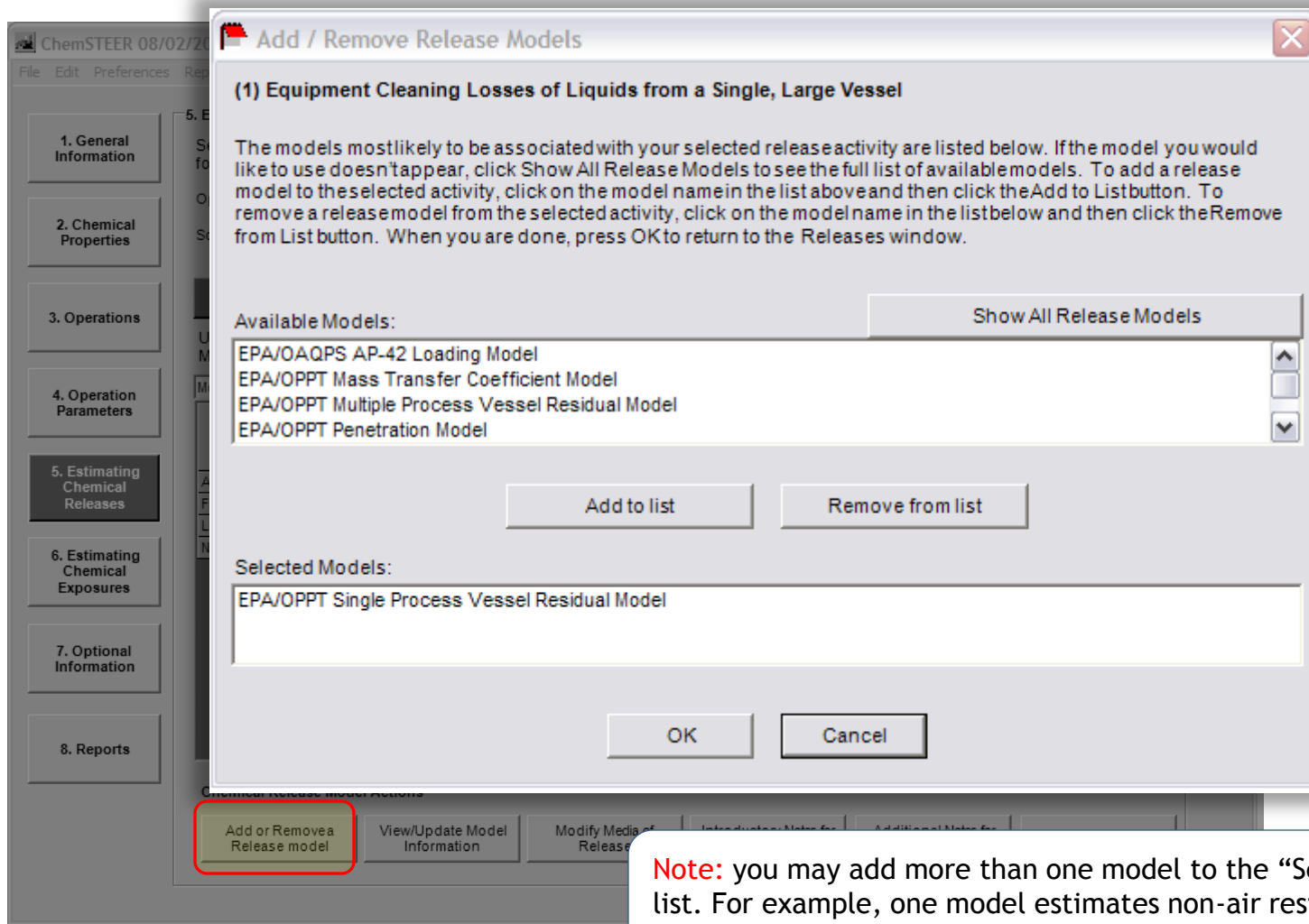
Input parameters for the selected model are shown in the Release Input Parameter screen below.

This subtab indicates which parameters are ChemSTEER default values, the origin of the parameter value (i.e., whether previously input in another tab or calculated from other input parameters), the current value, and the units.

Release Model Actions are discussed in the subsequent screens

## 5a. Releases → Release Input Parameters (Add/Remove Release Model)

The *Add/Remove Release Model* screen shows the currently selected model(s) and additional available models for the selected Operation/Source.



The upper window shows the most appropriate alternative / additional models for the selected release source.

You may select any model listed and add them to the selected models list.

**Note:** you may add more than one model to the “Selected Models” list. For example, one model estimates non-air residual release, while another model estimates air release from a volatile compound.



## 5a. Releases → Release Input Parameters (View/Update Model Information)

The *View/Update Model Information* screen displays information about the selected model, including:

- the equation(s) used in the calculation;
- a description of the basis/source of the model; and
- a list of the parameters used.

**View / Update Release Model Information**

Read-only and updateable information about the selected release model are shown below. Click on the associated Type column label for a parameter to change its value. When the Type is User-defined, you enter your value directly in the Value column. To calculate two sets of model results, enable the Model Parameters for the Output 1 option and the Model Parameters for the Output 2 option below. Note that Output 1 parameters are used to calculate the Output 1 model results and Output 2 parameters are used to calculate the Output 2 model results. Use care and consistency in entering the parameter values to ensure that the are used appropriately by the model equation(s).

Activity: (1) Equipment Cleaning Losses of Liquids from a Single, Large Vessel  
Model: EPA/OPPT Single Process Vessel Residual Model

Model Equation:  $DR \text{ (kg/site-day)} = LF \times Amt$

Vapor Release Mechanism: Not applicable

Enable Model Parameters for Output 1       Enable Model Parameters for Output 2

High End to Bounding      Conservative

Basis: EPA/OPPT Single Vessel Residual Model, CEB standard 1% residual. Media of release is unknown. Assess release to water, incineration, or landfill.

Parameters:

Parameter	Type 2	Origin 2	Value 2	Units
Amt: Amount to Use	Default	BMOchem x Nbd	40	kg/site-day
Freq: Frequency to Use	Default	OD	250	days/site-yr
LF: Loss Fraction	Default	Model Parm	0.01	dimensionless
NS: Number of Sites	Default	Mass Parm	1	sites

To change a parameter value, click on the associated *Type* field.

OK      Cancel

ChemSTEER 08/      Add or Remove Release model      **View/Update Model Information**      Modify Media of Release      Introductory Notes for the Release Summary      Additional Notes for the Release Summary      Run Model(s)

- For some parameters, you can change the *Type* field from 'Default' to 'Non-default'. If you choose 'Non-default', you may then click on the associated *Value* field and enter the new value for the parameter.
- Other parameters will prompt you to select from a specified list of alternative values.

## 5a. Releases → Release Input Parameters (Modify Media of Release)

Use the *Modify Media of Release* button to change the default media (i.e., water, air, incineration, landfill) to which the selected source releases will be emitted.

Update release media output specifications

Verify or change the media for the estimated release below.

**Manufacturing: Batch**

**(1) Equipment Cleaning Losses of Liquids from a Single, Large Vessel**

To (NPDES number if appropriate): off-site incineration

Basis: EPA/OPPT Single Vessel Residual Model, CEB standard 1% residual. Reaction vessel will be cleaned with solvent and the spent solvent is sent off-site for incineration.

Water	0	%	Air	0	%	Deepwell Injection	0	%
Water or Air	0	%	Air or Incineration	0	%	Destroyed	0	%
Water or Air or Incineration	0	%	Air or Incineration or Landfill	0	%	Other	0	%
Water or Air or Landfill	0	%	Air or Landfill	0	%			
Water or Air or Incineration or Landfill	0	%	Incineration	100	%			
Water or Incineration	0	%	Incineration or Landfill	0	%			
Water or Incineration or Landfill	0	%	Landfill	0	%			
Water or Landfill	0	%						

OK Cancel Total: 100%

Add or Remove Release model View/Update Model Information **Modify Media of Release** Introductory Notes for the Release Summary Additional Notes for the Release Summary Run Model(s)

In this screen, the selected operation and release source is listed, as well as the selected release model and description of the model basis/source.

You can apportion the total amount of the calculated release to more than one target. For example, if the residues from the cleaning of the single, large vessel are treated in a WWT system that is 90% efficient in removing the chemical from the final effluent, we would apportion the total release as:

- 90% to sludge (collected and sent to an incinerator); and
- 10% to water.

# 5a. Releases → Release Input Parameters (Introductory and Additional Notes for the Release Summary)

Using the *Introductory Notes for the Release Summary* and/or *Additional Notes for the Release Summary* buttons, you may add additional information related to the release assessments.

**Note:** These screens are primarily for EPA purposes and not required for an assessment.

	Conservative	Cor	Conservative	
Amt: Amount to Use	Default	BMOche	40	kg/site-
Freq: Frequency to Use	Default	OD	250	days/st
LF: Loss Fraction	Default	Model Parm	0.01	dimensi
NS: Number of Sites	Default	Mass Parm	1	sites

Chemical Release Model Actions

Add or Remove a Release model | View/Update Model Information | Modify Media of Release | **Introductory Notes for the Release Summary** | **Additional Notes for the Release Summary** | Run Model(s)

## 5b. Releases → Estimated Releases

Model release estimates are shown on the *Estimated Releases* subtab. This screen displays the:

- Media of release,
- Number of sites releasing the chemical,
- Days of release (days/site-yr),
- Daily release rate (kg/site-day),
- Annual release rate (kg/year; all sites), and
- Basis for the selected release model.

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5. Estimating Chemical Releases

Select the desired operation, source, and release model below. Read the "Estimating Chemical Releases Tab" topic of the User Guide for more detailed information.

Operation: Manufacturing: Batch Release Model(s): EPA/OPPT Single Process Vessel Residual Model

Source: (1) Equipment Cleaning Losses of Liquids from a Single, Large Vessel

5a. Release Input Parameters 5b. Estimated Releases

Estimated releases for the selected operation and release source are summarized below.

Media	Characterization of Results	Number of Sites	Days of Release (days/site-yr)	Daily Release Rate (kg/site-day)	Annual Release Rate (kg/yr-all-sites)	EPA/OPP
Water or Incineration or Landfill	Conservative	1	250	0.4	100	EPA/OPP

Chemical Release Model Actions

Add or Remove Release model View/Update Model Information Modify Media of Release Introductory Notes for the Release Summary Additional Notes for the Release Summary Run Model(s)

**Note:** You can click on the *Run Model(s)* button at any point while you are on the "5. Estimating Chemical Releases" tab to execute the release model calculations.

# 6. Estimating Chemical Exposures

You can use the *Estimating Chemical Exposures* tab to view, update, and run the model(s) used to calculate the dermal and/or inhalation exposures for each of the operations' activities.

In this tab you may:

- View and/or update which models are used;
- View/update the specific model-related parameters; and
- View the model results (estimated exposures)

ChemSTEER currently contains more than 15 different models that can be used to calculate dermal and inhalation exposures, each with their own set of default settings and values.

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6. Estimating Chemical Exposures

Select the desired operation and worker activity below. Refer to the detailed information.

Operation: Manufacturing: Batch

Source: (2) Loading Liquid Product into Drums

6a. Dermal Model Params    6b. Inhalation Model Params    6c. Resp Class & Monitor Review    6d. Activity Exposure Est

Use the buttons below to add, remove, or update dermal exposure models, or add notes to the release summary. When complete, click the "Run Model(s)" button below to generate the results. Results are shown on tab 6d.

Chemical State: Liquid    Model Status: Model was successfully run

EPA/OPPT 2-Hand Dermal Contact with Liquid Model

Parameter	Type	Origin	Value	Units
AT: Averaging Time	Default	Model Parm	40	years
ATc: Averaging Time over a	Default	Model Parm	70	years
BW: Body Weight	Default	Model Parm	70	kg
ED: Exposure Days	Default	ODa	250	days/site-yr
EY: Years of Occupation	Default	Model Parm	40	years
FT: Frequency of Events	Default	Model Parm	1	events/site-c
NS: Number of Sites	Default	Mass Parm	1	sites
NWexp: Number of Workers	Default	Model Parm	1	workers/site
Qu: Quantity for Chemical on	Default	Model Parm	2.1	mg/cm2-eve
S: Surface Area	Constant	Model Parm	840	cm2

Exposure Model Actions

Add or Remove an Exposure model    View/Update Dermal Model Information    Introductory Notes for the Dermal Summary    Run Model(s)    Update Operation Total Number of Workers Exposed

Select the operation and worker activity at the top of the screen.

For the operation/activity selected above, subtab 6a shows the dermal model parameters and subtab 6b shows the inhalation model parameters. Subtab 6d shows the exposure estimates.

## 6. Exposures → Add or Remove an Exposure Model

The *Add/Remove Exposure Model* screen shows the currently selected models for the selected Operation/Activity. However, you may choose to change the default models that are used for the selected exposure activity.

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6. Estimating Chemical Exposures

Select the desired operation and worker activity below. Read the "Estimating Chemical Exposures Tab" topic of the User Guide for more detailed information.

Operation: Ma

Source: (2)

6a. Dermal

Use the button the "Run Model

Chemical State

EPA/OPPT 2-H

Pa

AT: Averaging

ATc: Averagin

BW: Body Wei

ED: Exposure l

EY: Years of C

FT: Frequency

NS: Number of Sites	Default	Mass Parm	1	sites
NWexp: Number of Workers	Default	Model Parm	1	workers/site
Qu: Quantity for Chemical on	Default	Model Parm	2.1	mg/cm2-eve
S: Surface Area	Constant	Model Parm	840	cm2

Exposure Model Actions

Add or Remove an Exposure Model

View/Update Dermal Model Information

Introductory Notes for the Dermal Summary

Run Model(s)

Update Operation Total Number of Workers Exposed

**Add / Remove Exposure Models**

(2) Loading Liquid Product into Drums

Add or update the exposure-based criteria below, then press OK

Dermal Model: EPA/OPPT 2-Hand Dermal Contact with Liquid Model

Inhalation Model: None Selected

OK Cancel

Use the drop-down menu to select alternative dermal and inhalation models.

**Note:** Unlike release models, you can only choose one dermal and one inhalation exposure model per worker activity.

# 6a. Exposures → Dermal Model Parameters

On the Dermal Model Parameters subtab, there are two Exposure Model Actions that are specific to dermal exposures:

- View/Update Dermal Model Information;
- and
- Introductory Notes for Release Summary.

**Note:** Subtab 6b. *Exposures → Inhalation Parameters* contains a corresponding screen for inhalation exposure models.

Parameters for the selected operation and worker activity are shown in the Dermal Model Parameter screen below.

6. Estimating Chemical Exposures

Select the desired operation and worker activity and view detailed information.

Operation: Manufacturing: Batch  
Source: (2) Loading Liquid Product into Drums

6a. Dermal Model Params | 6b. Inhalation Model Params | 6c. Resp Class & Monitor Review | 6d. Activity Exposure Est

Use the buttons below to add, remove, or update dermal exposure models, or add notes to the release summary. When complete, click the "Run Model(s)" button below to generate the results. Results are shown on tab 6d.

Chemical State: Liquid | Model Status: Model was successfully run

EPA/OPPT 2-Hand Dermal Contact with Liquid Model

Parameter	Type	Origin	Value	Units
AT: Averaging Time	Default	Model Parm	40	years
ATc: Averaging Time over a	Default	Model Parm	70	years
BW: Body Weight	Default	Model Parm	70	kg
ED: Exposure Days	Default	ODa	250	days/site-yr
EY: Years of Occupation	Default	Model Parm	40	years
FT: Frequency of Events	Default	Model Parm	1	events/site-c
NS: Number of Sites	Default	Mass Parm	1	sites
NWexp: Number of Workers	Default	Model Parm	1	workers/site
Qu: Quantity for Chemical on	Default	Model Parm	2.1	mg/cm2-ve
S: Surface Area	Constant	Model Parm	840	cm2

Exposure Model Actions

Add or Remove an Exposure model | View/Update Dermal Model Information | Introductory Notes for the Dermal Summary | Run Model(s) | Update Operation Total Number of Workers Exposed

Selected Dermal Model

This subtab indicates which parameters are ChemSTEER default values, the origin of the parameter value (i.e., whether previously input in another tab or calculated from other input parameters), the current value, and the units.

## 6a. Exposures → Dermal Model Parameters (View/Update Dermal Model Information)

The *View/Update Dermal Exposure Model Information* screen displays information about the selected model, including:

- The equation(s) used in the calculation;
- A description of the mechanism of exposure;
- The chemical state;
- The basis/source of the model; and
- A list of the parameters used by the model.

**Note:** Subtab 6b. *Exposures → Inhalation Parameters* contains a corresponding screen for inhalation exposure models.

View / Update Exposure Model Information

Read-only and updatable information about the selected exposure model are shown below. Click on the associated Type column label for a parameter to change its value. When the Type is User-defined, you enter your value directly in the Value column. To calculate two sets of model results, enable the Model Parameters for Output 1 option and the Model Parameters for Output 2 option below. Note that Output 1 parameters are used to calculate the Output 1 model results and Output 2 parameters are used to calculate the Output 2 model results. Use care and consistency in entering the parameter values to ensure that they are used appropriately by the model equation(s).

Activity: (2) Loading Liquid Product into Drums  
Model: EPA/OPPT 2-Hand Dermal Contact with Liquid Model

Model Equation:  $D_{exp} = S \times Q_u \times W_f \times F_T$

Potential Route / Form(s) of Exposure: Dermal contact/Liquid

Chemical State: Liquid

Enable Model Parameters for Output 1  Enable Model Parameters for Output 2

Output 1: [ ] High End: [ ]

Basis: EPA/OPPT 2-Hand Dermal Contact with Liquids Model.

Parameter	Type 2	Origin 2	Value 2	Units
AT: Averaging Time	Default	Model Parm	40	years
ATc: Averaging Time over a Lifetime	Default	Model Parm	70	years
BW: Body Weight	Default	Model Parm	70	kg
ED: Exposure Days	Default	ODa	250	days/site-yr
EY: Years of Occupation Exposure	Default	Model Parm	40	years
FT: Frequency of Events	Default	Model Parm	1	events/site-c

OK Cancel

View/Update Dermal Model Information

- For some parameters, you can change the *Type* field from 'Default' to 'Non-default'. If you choose 'Non-default', you may then click on the associated *Value* field and enter the new value for the parameter.
- Other parameters will prompt you to select from a specified list of alternative values.



## 6a. Exposures → Introductory Notes for the Dermal Summary

Using *the Introductory Notes for the Dermal Summary* and/or *Introductory Notes for the Inhalation Summary* buttons, you may add additional information related to the release assessments.

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6. Estimating Chemical Exposures

Select the desired operation and view detailed information.

Operation: Manufacturing: Batch

Source: (2) Loading Liquid Product

6a. Dermal Model Params

Use the buttons below to add, remove, or update the "Run Model(s)" button below to

Chemical State: Liquid

EPA/OPPT 2-Hand Dermal Contact w

Parameter	Default	Model Parm	Value
AT: Averaging Time	Default	Model Parm	40 years
ATc: Averaging Time over a	Default	Model Parm	1 events/site-c
BW: Body Weight	Default	Mass Parm	1 sites
ED: Exposure Days	Default	Model Parm	1 workers/site
EY: Years of Occupation	Default	Model Parm	2.1 mg/cm2-aver
FT: Frequency of Events	Default	Model Parm	840 cm2
NS: Number of Sites	Default	Model Parm	
NWexp: Number of Workers	Default	Model Parm	
Qu: Quantity for Chemical on	Default	Model Parm	
S: Surface Area	Constant	Model Parm	

Exposure Model Actions

Add or Remove an Exposure model View/Update Dermal Model Information **Introductory Notes for the Dermal Summary** Run Model(s) Update Operation Total Number of Workers Exposed

**View / Update Dermal Basis for the Operation**

Text added to this box will appear on the IRER report at the beginning of the Dermal section for this operation.

Select standard text

Add Standard text

OK Cancel

**Note:** Subtab 6b. *Exposures → Inhalation Parameters* contains a corresponding screen for inhalation exposure models.

## 6c. Exposures → Respirator Class & Monitor Review (*Read-only*)

The *Respirator Class and Monitoring Review* subtab is populated automatically and is read-only. This subtab performs a review for all inhalation exposure models.

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6. Estimating Chemical Exposures

Select the desired operation and worker activity below. Read the "Estimating Chemical Exposures Tab" topic of the User Guide for more detailed information.

Operation: Manufacturing: Batch

Source: (2) Loading Liquid Product into Drums

6a. Dermal Model Params 6b. Inhalation Model Params 6c. Resp Class & Monitor Review 6d. Activity Exposure Est

Respirator Class and Monitor Review are automatically determined by ChemSTEER.

Respirator class is populated here for solid particulate exposures

INHALATION MONITORING DATA REVIEW

1) Uncertainty (estimate based on model, regulatory limit, or data not specified to industry):

2) a) Exposure level > 1 mg/day?  
OR  
b) Hazard Rating for health of 2 or greater?

Inhalation Monitoring Data Desired?

Question 1 is "Yes" if a model is used to assess inhalation exposures.

Question 2 is "Yes" if either the exposure is >1mg/day or the Health Rating on the SAT report is 2 or greater.

If the results of both questions 1 and 2 are "Yes" then inhalation monitoring is desired.

Exposure Model Actions

Add or Remove Exposure model View/Update Dermal Model Information Introductory Notes for the Dermal Summary Run Model(s) Update Operation Total Number of Workers Exposed

## 6d. Exposures → Activity Exposure Estimates

The *Activity Exposure Estimates* subtab shows the results of the exposures calculations. This screen displays the:

- Route of Exposure (Dermal or Inhalation);
- Number of Workers Exposed;
- Exposure Days per Year;
- Potential Dose Rate (mg/day);
- Lifetime Average Daily Dose (mg/kg-day);
- Acute Potential Dose (mg/kg-day); and
- Basis for each exposure model.

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6. Estimating Chemical Exposures

Select the desired operation and worker activity below. Read the "Estimating Chemical Exposures Tab" topic of the User Guide for more detailed information.

Operation: Manufacturing: Batch  
Source: (2) Loading Liquid Product into Drums

6a. Dermal Model Params    6b. Inhalation Model Params    6c. Resp Class & Monitor Review    **6d. Activity Exposure Est**

Estimated exposures for the selected operation and worker activity are summarized below.

Route of Exposure	Characterization of Results	Total Number of Workers	Exposure Days per Year	Potential Dose Rate (mg/day)	Lifetime Average Daily Dose (mg/kg-day)	Average Daily Dose (mg/kg-day)	Acute Potential Dose (mg/kg-day)	Basis
Dermal	High End	3	250	1,764	9.863	17.2603	25.2	EPA/OPPT 2-Hand Dermal

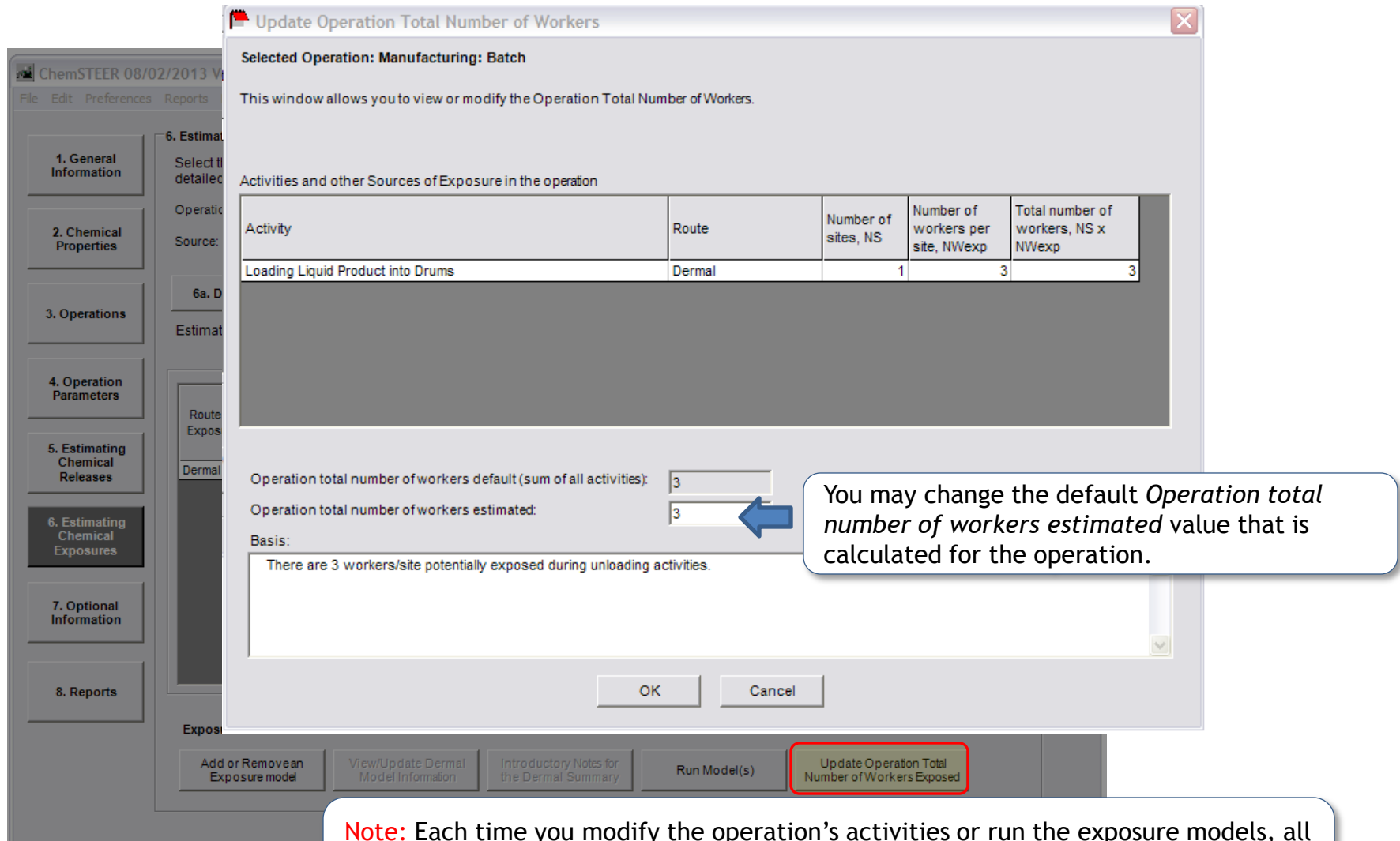
Exposure Model Actions

Add or Remove an Exposure model    View/Update Dermal Model Information    Introductory Notes for the Dermal Summary    **Run Model(s)**    Update Operation Total Number of Workers Exposed

You can click on the **Run Model(s)** button at any point while you are on the *Estimating Chemical Exposures* subtab to execute the exposure model calculations.

## 6. Exposures → Update Operation Total Number of Workers

The *Update Operation Total Number of Workers Exposed* screen shows a summary of the number of workers exposed for each a worker activity in a particular operation.



**Update Operation Total Number of Workers**

Selected Operation: Manufacturing: Batch

This window allows you to view or modify the Operation Total Number of Workers.

Activities and other Sources of Exposure in the operation

Activity	Route	Number of sites, NS	Number of workers per site, NWexp	Total number of workers, NS x NWexp
Loading Liquid Product into Drums	Dermal	1	3	3

Operation total number of workers default (sum of all activities):

Operation total number of workers estimated:

Basis:  
There are 3 workers/site potentially exposed during unloading activities.

OK Cancel

**Note:** You may change the default *Operation total number of workers estimated* value that is calculated for the operation.

**Note:** Each time you modify the operation's activities or run the exposure models, all values in the summary table will be updated, including the *Operation total number of workers estimated* value if you entered an alternate number.

# 7. Optional Information

This tab contains several input screens that you may select from the drop down list, including:

- MSDS/Label/Exposure Limits;
- Pollution Prevention Considerations
- Notes and Key Assumptions used in the assessment

Some of the input screens are designed to serve EPA's internal assessments, including:

- SAT Data
- Exposure-based Criteria
- Other Uses, Occupational Exposure Rating, and Consumer Use

The screenshot shows the ChemSTEER software interface with the '7. Optional Information' tab selected. The interface includes a sidebar with buttons for '1. General Information', '2. Chemical Properties', '3. Operations', '4. Operation Parameters', '5. Estimating Chemical Releases', '6. Estimating Chemical Exposures', '7. Optional Information', and '8. Reports'. The main area displays a dropdown menu with the following options: 'SAT Data', 'Exposure-Based Criteria', 'MSDS / Label / Exposure Limits', 'Pollution Prevention Considerations', 'Notes and Key Assumptions', 'Physical State and Misc. CRSS Info, Other Uses, Occupational Exposure Rating, and Consumer Use', and 'Special LVE Considerations'. Below the dropdown, there are sections for 'Health Requirements and Rating' and 'Eco Requirements and Rating', each with various input fields and checkboxes. At the bottom, there is a button labeled 'Update Optional Information'.

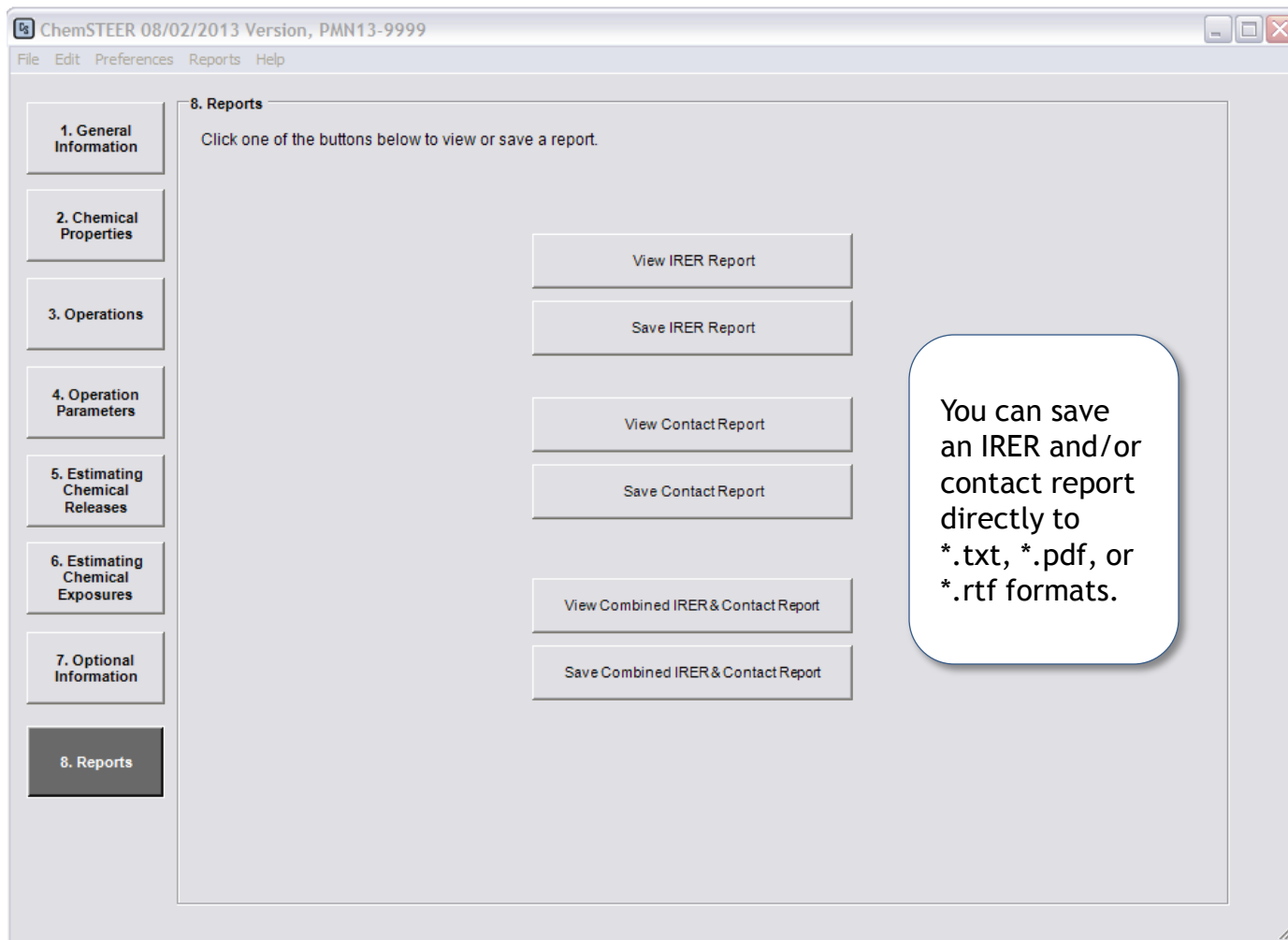
To enter any additional information about your assessment, select the appropriate screen from the dropdown menu and click on the **Update Optional Information** button.

## 8. Reports

There are two types of reports that are currently programmed into ChemSTEER: the Initial Review Engineering Report (IRER) and the Contact Report. The *Reports* tab can be used to view and save completed IRERs and contact reports.

IRER - EPA currently uses the IRER for its assessments of new chemicals under the Premanufacture Notice program. This report is a summary of the assessment and contains all of the information that is input to or calculated by ChemSTEER.

Contact Report - The Contact Report summarizes information obtained through contact with an individual pertaining to the assessment. This information is input into ChemSTEER in the *General* tab.



**Note:** Reports can also be generated and saved using the file menu (*Reports* option).

## Additional Information

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- Contact information and the most recent version of ChemSTEER are available from the following EPA website:  
<http://www.epa.gov/oppt/exposure/pubs/chemsteer.htm>
- This web site also contains links to other exposure-related information and references available from EPA.