



Combined Air Emissions Reporting System (CAERS) Reporting Control Devices in CAERS

CAERS Training
IEIC Seattle, WA
September 29, 2023

Disclaimer

This training is intended for instructional purposes only. Data shown in the training are illustrative, and do not represent a real report for any facility or inventory year. None of the examples represent a complete report. This training does not cover examples of all possible control device configurations. You should always consult your State, Local, Tribal Authority (SLT) if you have questions when entering control device information into CAERS.

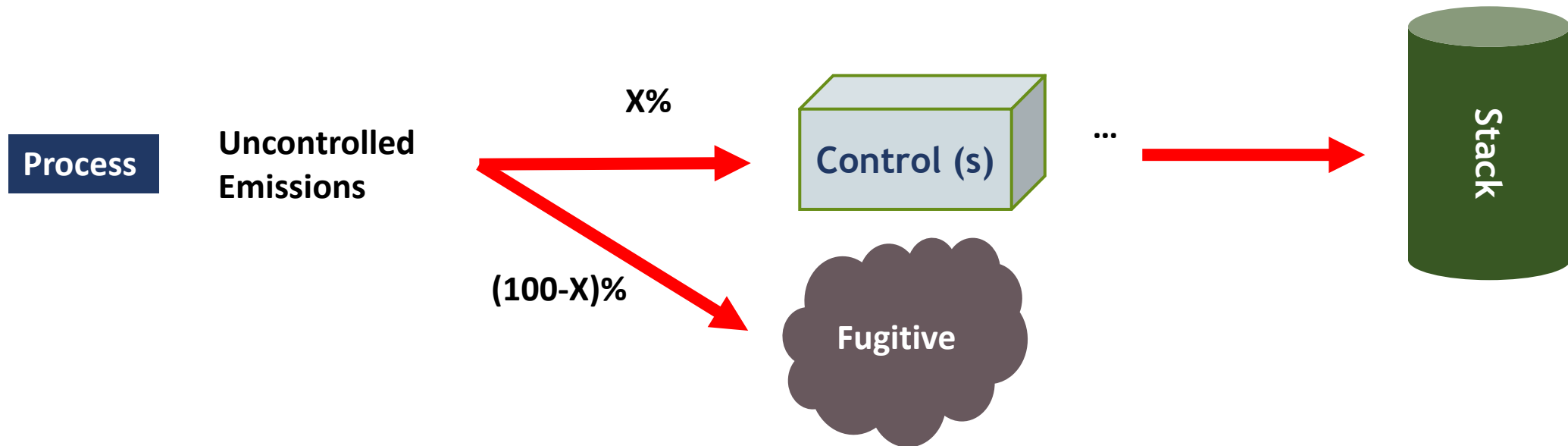
Outline of Training

- Control-related Concepts and Data Fields
- Steps to Enter Data (where/how to enter your data)
- Examples (what data to enter)
 - No Control Devices
 - Single Control Device
 - Controls in Series
 - Controls in Parallel
 - Complex Control Device Configurations
- Questions

Control-related Concepts and Data Fields

Release Point Apportionment

Percent release point apportionment: The average annual percent of an emissions process that is vented through a release point. The percent of emissions that are sent to a *stack release point* through controls is also referred to as “capture efficiency”. **Percent captured = Percent pollutant stream routed to the device going to “stack” type release points (X%).** **Percent not captured = Percent going to “fugitive” release point (100-X)%**



Note that 100% of the original emissions must be assigned to one or more release points

Release Point Apportionment in the User Interface

Found in the screen for each existing process under the “Release Points Associated with this Process” heading.

The process and release point(s) must exist in CAERs before emissions can be apportioned.

The screenshot displays the EPA MyCDX user interface for configuring a process. A modal dialog titled "Release Point Apportionment" is open, allowing users to assign a percentage of emissions to a specific release point. The background page shows process details for Unit ID A201 and Process ID P201, including operating status, reporting period, and associated emissions and controls.

Release Point Apportionment Dialog:

- Select a Release Point*
- Select a Control Path (optional)
- % Release Point Apportionment*
- Buttons: Save, Cancel

Process Configuration Page:

- Unit ID: A201, Process ID: P201, Operating Status: Operating, SCC: 103001
- Reporting Period: Annual, Operating Type: Routine, Throughput Parameter: Input
- Throughput Material: Anthracite, Throughput Value: 100, Throughput UoM: TONS
- Fuel Material: Anthracite, Fuel Value: 25.09, Fuel UoM: TONS
- Heat Content Ratio: 25.09, Heat Content Ratio Numerator: MILLION BTUS

Emissions Associated with this Process:

Pollutant Name	Code	CAS ID
Carbon Monoxide	CO	630-08-0
PM10 Primary (Filt + Cond)	PM10-PRI	
Volatile Organic Compounds	VOC	

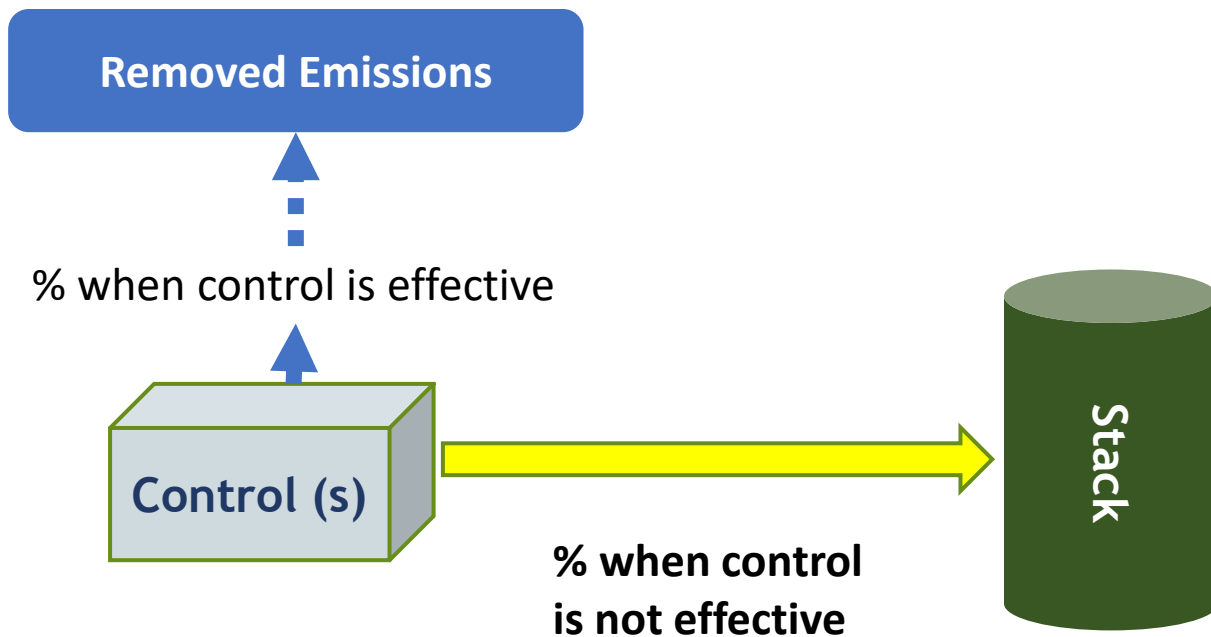
Release Points Associated with this Process:

Release Point	Release Type	Control Path	%
Total % Apportionment of Emissions			0%

Note: Each process must allocate exactly 100% of its emissions to one or more release points before the report can be submitted.

Percent Control Effectiveness

Percent control effectiveness: The percentage of time or activity throughput that a control approach is operating as designed, including the capture and reduction devices. This percentage accounts for the fact that controls typically are not 100% effective because of equipment downtime, upsets and decreases in control efficiencies. This could be estimated from the amount of time the control is operational, versus down for maintenance or repairs. When the control is not effective, the pollutant is not removed from the emissions stream.



Example:

Control Effectiveness =

$(2000-200)/(2000) * 100 = 90\%$, where:

- the emissions Process or Unit ran for 2000 hours.
- the Control Scenario was operationally down for 200 hours.

Control Effectiveness in the User Interface

Found in the screen for each new or existing control device.

Agency ID: 99999999
Facility Inc.
123 Main Street
Mytown, GA 12345
2021 Emissions Report
Agency: GADNR

Report Summary
Report History
Quality Checks
Report Creation Log
Monthly Fuel Reporting
Data Bulk Entry

▼ Facility Inventory
Facility Information
Emissions Units
Release Points
Control Devices
Control Paths

▼ Emissions Inventory
▶ A201
▶ B201

Report Facility & Emissions Information | Perform Quality Checks | Submit to SLT Authority | Approved by SLT Authority

Control Device Information

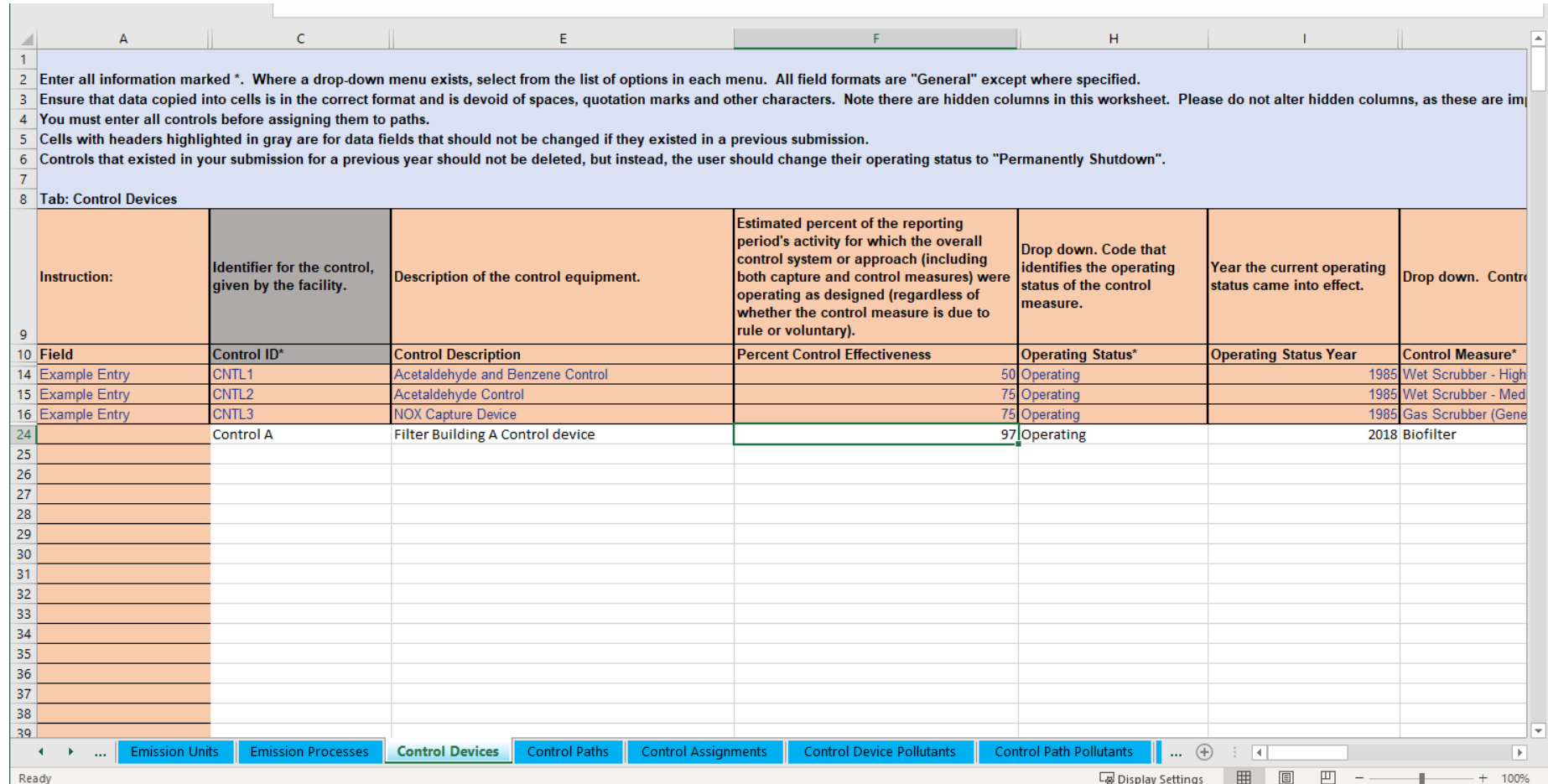
Control ID:	Control A	Operating Status:	Operating
Control Measure:	Biofilter	Operating Status Year:	2018
Control Description:			
Control Number Operating Months:	12	Percent Control Effectiveness:	97
Control Start Date:	2018-01-02	Control Upgrade Date:	yyyy-mm-dd
Control End Date:	yyyy-mm-dd		
Control Upgrade Description:			
Comments:			

Cancel Save

EPA Home | MyCDX | Accessibility Notice | Privacy and Security Notice

Control Effectiveness in the Bulk Upload Template

Found in the
"Control Device"
tab.



The screenshot displays an Excel spreadsheet with the following content:

Instructions:

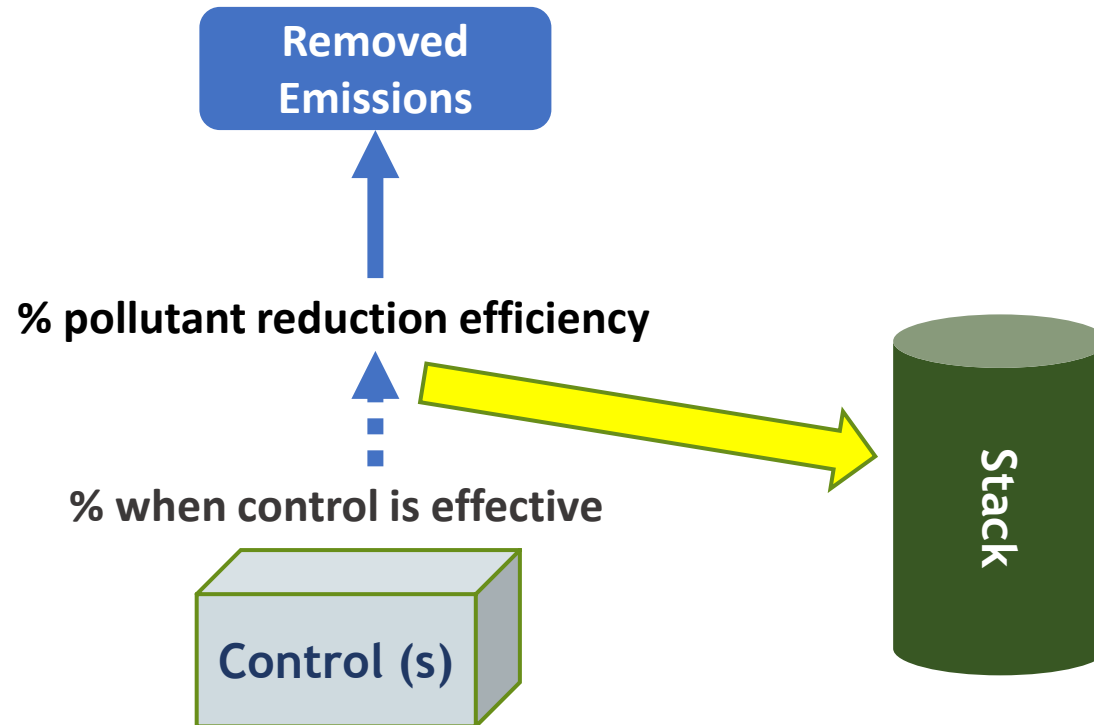
- Enter all information marked *. Where a drop-down menu exists, select from the list of options in each menu. All field formats are "General" except where specified.
- Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters. Note there are hidden columns in this worksheet. Please do not alter hidden columns, as these are important.
- You must enter all controls before assigning them to paths.
- Cells with headers highlighted in gray are for data fields that should not be changed if they existed in a previous submission.
- Controls that existed in your submission for a previous year should not be deleted, but instead, the user should change their operating status to "Permanently Shutdown".

Tab: Control Devices

Field	Control ID*	Control Description	Percent Control Effectiveness	Operating Status*	Operating Status Year	Control Measure*
Example Entry	CNTL1	Acetaldehyde and Benzene Control	50	Operating	1985	Wet Scrubber - High
Example Entry	CNTL2	Acetaldehyde Control	75	Operating	1985	Wet Scrubber - Med
Example Entry	CNTL3	NOX Capture Device	75	Operating	1985	Gas Scrubber (Gene
	Control A	Filter Building A Control device	97	Operating	2018	Biofilter

Control Percent Pollutant Reduction Efficiency

Percent Pollutant Reduction Efficiency: The percent reduction achieved for the pollutant when all control measures are operating as designed. This information could be obtained from the vendor or test data, for example.



Example:
The control device removes 95% of the pollutant.

Control Percent Pollutant Reduction Efficiency in the User Interface

Found in the screen for each existing control device, under “Control Device Pollutants”.

The screenshot displays the CAERS user interface. A modal window titled "Control Device Pollutant" is open, allowing users to input data for a specific control device. The modal contains two input fields: "Pollutant:" and "Percent Reduction Efficiency:". Below the modal, the main interface shows a sidebar with navigation options like "MyFacilities", "Emissions Reports", and "2021 Emissions Report". The main content area includes sections for "Control Device Assignment", "Paths Associated with this Control", and "Control Device Pollutants". The "Control Device Pollutants" section features a table with columns for "Pollutant Name", "Code", "CAS ID", and "% Reduction Efficiency".

Identifier	Component	Type
------------	-----------	------

Path Identifier	Path Description
-----------------	------------------

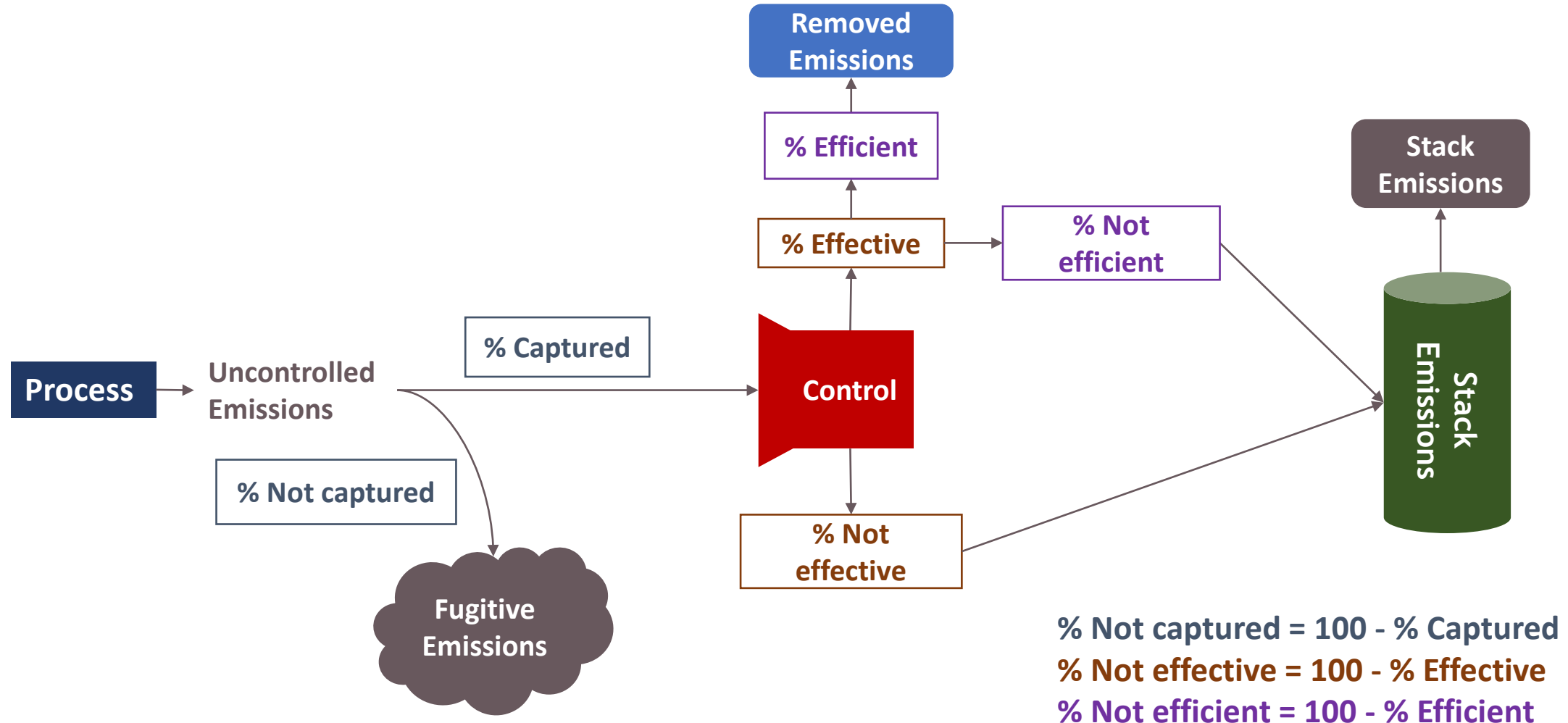
Pollutant Name	Code	CAS ID	% Reduction Efficiency
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Control Percent Pollutant Reduction Efficiency in the Bulk Upload Template

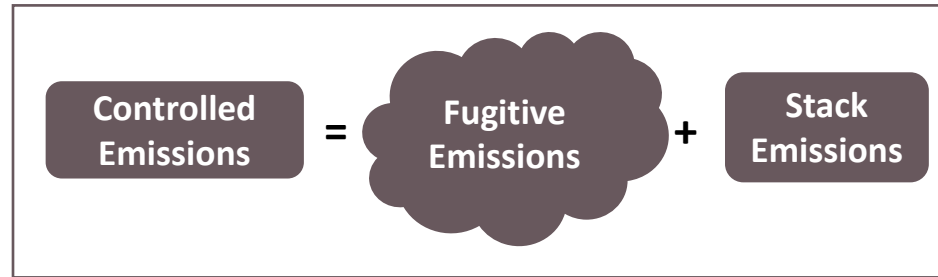
Found in the “Control Device Pollutants” tab and can be entered for existing controls.

1 Enter all information marked *. Where a drop-down menu exists, select from the list of options in each menu.			
2 All field formats are "General" except where specified.			
3 Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters.			
4 Note there are hidden columns in this worksheet. Please do not alter hidden columns, as these are important for data validations.			
5 Create controls before assigning them pollutants.			
6			
7			
8 Tab: Control Device Pollutants			
9 Instruction:	Drop down. Control ID for the equipment that is controlling the pollutant.	Drop down. Pollutant the equipment controls.	Efficiency with which the control removes the pollutant.
10 Field	Control ID*	Pollutant Name*	Percent Reduction Efficiency*
14 Example Entry	Control 001	Acetaldehyde	99.9
15 Example Entry	Control 002	Benzene	99.9
16 Example Entry	Control 001	Acetaldehyde	5.3
17 Example Entry	NOX Control	Nitrogen Oxides	5.3
24	Control A	Nitrogen Oxides	95
25			
26			
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30			
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41			

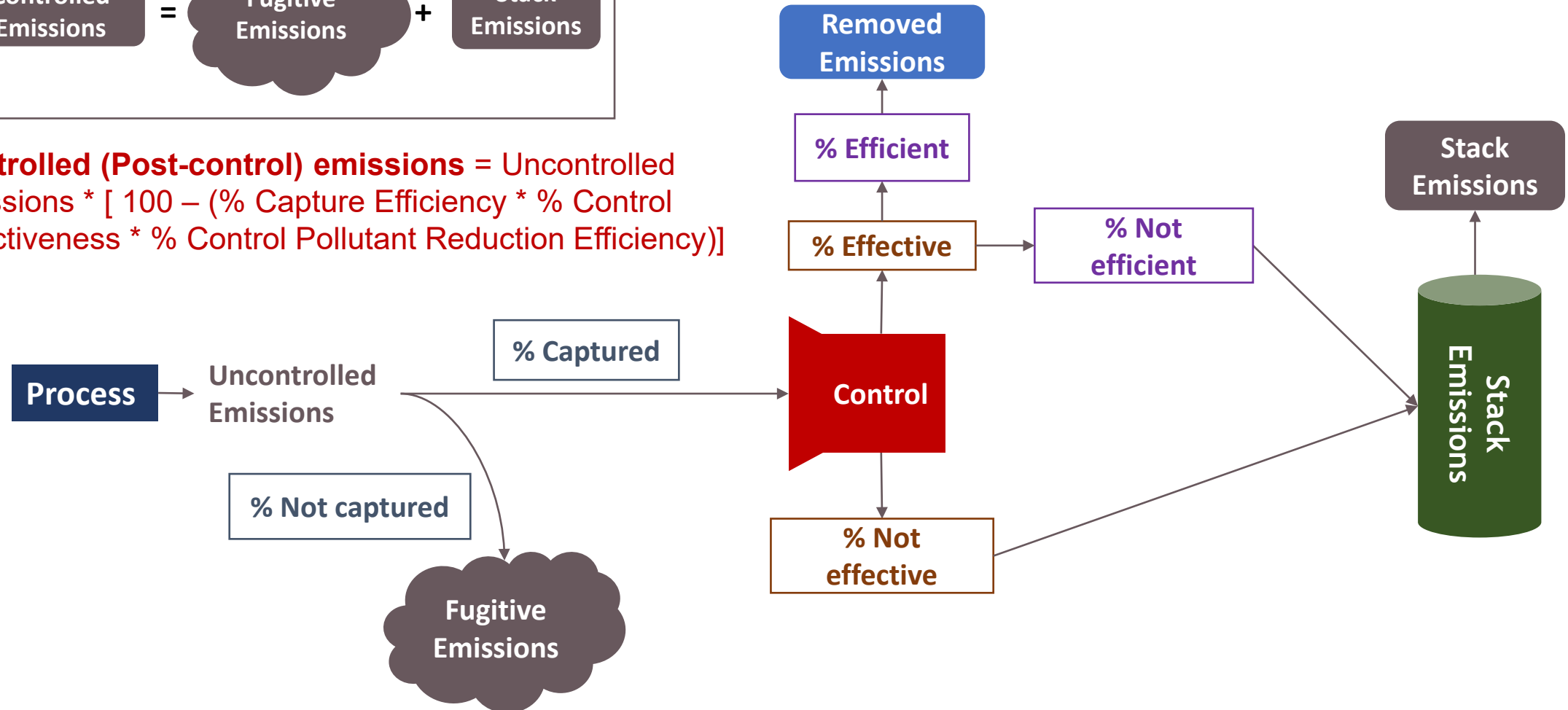
Flow of Uncontrolled Emissions



Controlled (Post-Control) Emissions



Controlled (Post-control) emissions = Uncontrolled emissions * [100 – (% Capture Efficiency * % Control Effectiveness * % Control Pollutant Reduction Efficiency)]



Accounting for the Entire Emissions Stream

- Uncontrolled emissions apportioned to release points => fugitives, captured emissions
- Captured emissions => emissions when control is effective, emissions when control is not effective
- Emissions from effective control => removed, not removed if control is not 100% efficient
- Removed emissions = uncontrolled emissions * capture * control effectiveness * control pollutant reduction efficiency
- Stack emissions = uncontrolled emissions * captured * (1 - control effectiveness * control pollutant reduction efficiency)
- Controlled (Post-control) Emissions = uncontrolled emissions * (1 - captured * control effectiveness * control pollutant reduction efficiency) = stack emissions + fugitive emissions

Reporting Control Devices Using Paths

- A list of individual control devices exist for the facility
- Only the pollutants controlled by each individual piece of control equipment are listed with that control. The % pollutant reduction efficiency is the amount of pollutant reduced due to this one piece of equipment.
- Control configuration is defined:
 - Single
 - In series
 - In parallel
 - Combinations / Complex Configurations
- Control devices are placed in paths and can be:
 - associated and linked between a unit/process and a release point
 - “reused” in reporting: emissions from more than one unit/process may use the same path to a release point

What is a Path?

- A **Path** contains:
 - one or more control devices that are connected
 - other paths, a **Child Path** is contained within another *parent* path.
- A **Parent Path**:
 - contains one or more children paths and can contain additional control devices.
 - can itself be a child path if it is contained within a larger parent path.
- A **Primary or Main Path**:
 - contains one or more control devices and/or children paths
 - associates the control devices/paths it contains from a unit/process to a release point

Path Concepts

Control Path Assignment: the position that a control devices has within a path with respect to other control devices that are present (for example, the first control device in a path is assigned 1).

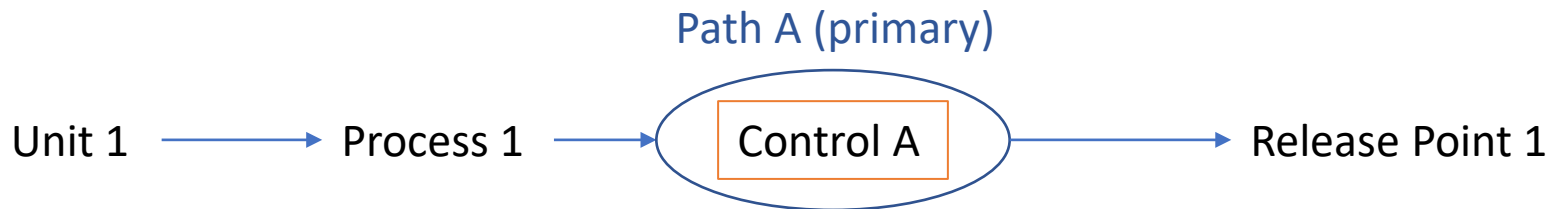
Control Apportionment: the percentage of the emissions that are being directed to the next control or path.

Path Effectiveness: The combined effectiveness of the controls in that path. Must be present on a main or primary path.

Path Pollutant Percent Reduction Efficiency: The combined percent reduction efficiency of the pollutant for the entire path. Must be present on a main or primary path.

Single Control Device

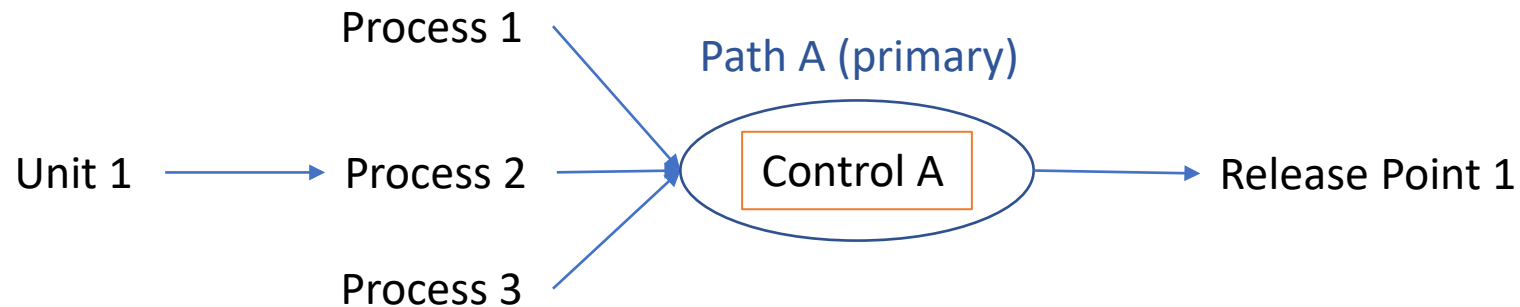
For a single control device one path is needed. The control is placed in that path. That path will be the primary path, and it will associate the process to the release point. Because there's only one control, path assignment is just equal to 1.



Information You Need: release point apportionment, control effectiveness, pollutant reduction efficiency, path assignment = 1, control apportionment = 100%.

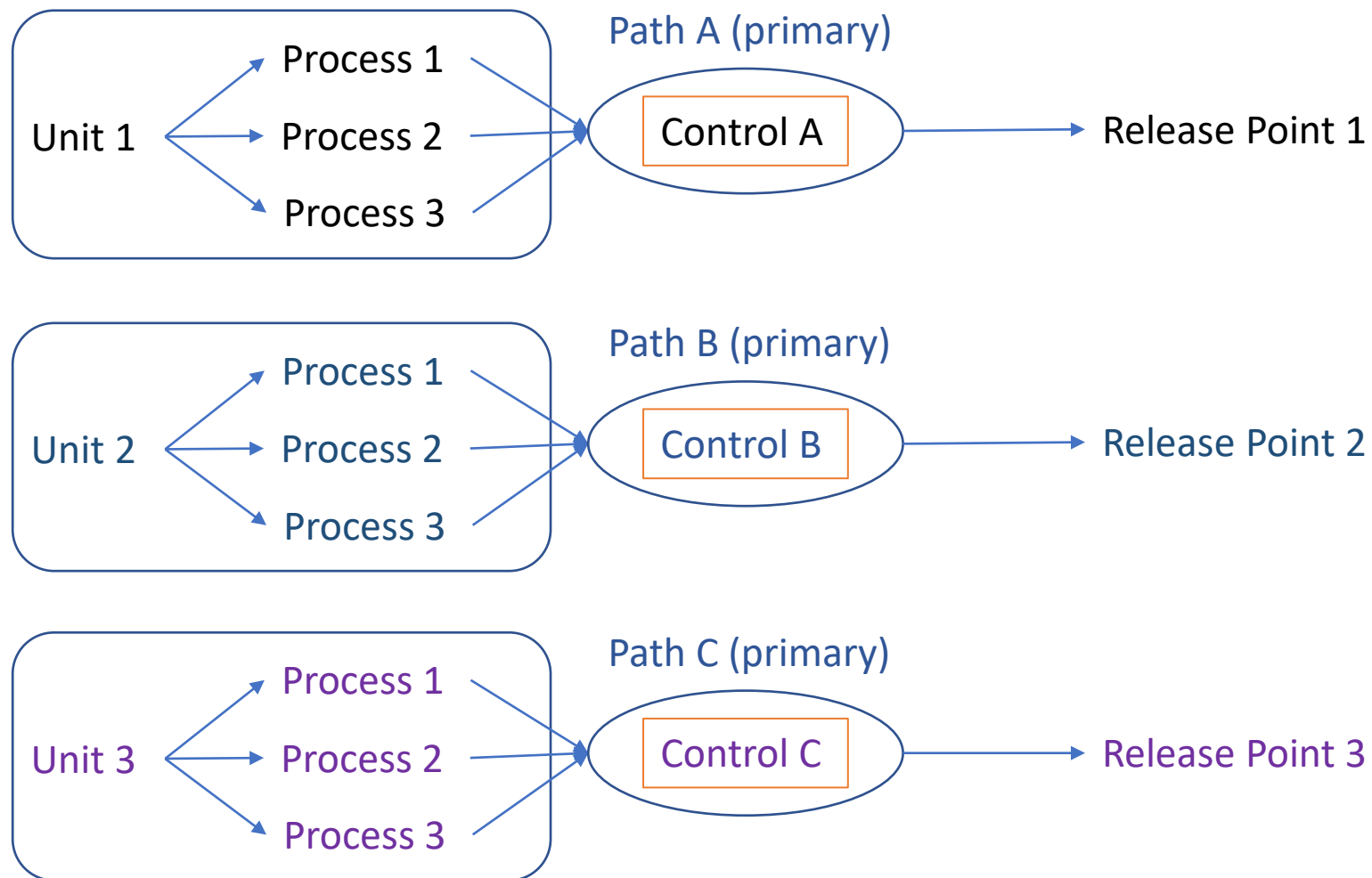
Single Control Device on Multiple Units/Processes

Note that once this path is created for a single control device, any process sending emissions to the same release point can also use that path. So, you only have to create that path once, then reuse it as needed for each process.



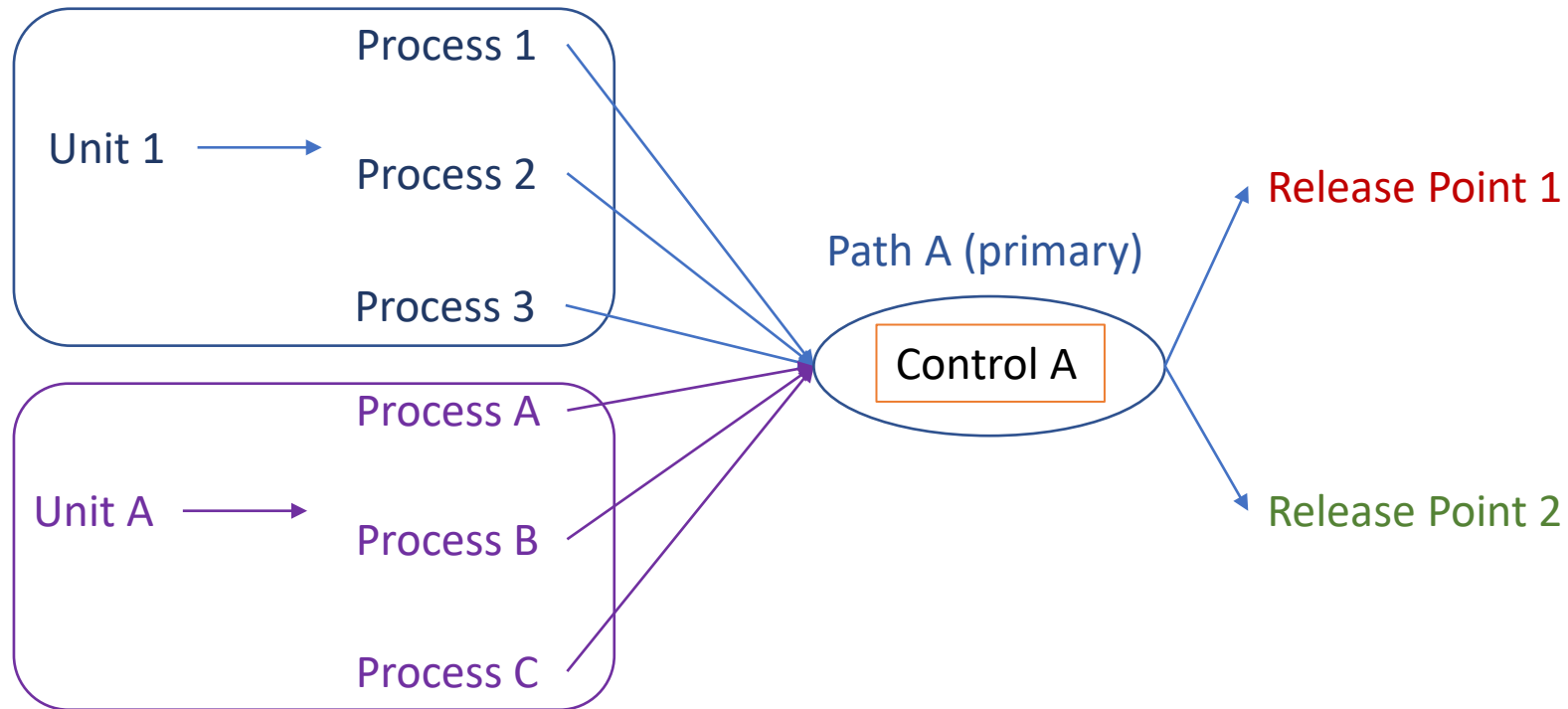
Information You Need: release point apportionment, control effectiveness, pollutant reduction efficiency, path assignment = 1, control apportionment = 100%.

Multiple “Single Control Devices”



The case of multiple control devices that are “single” controls between a unit/processes and release point is the same as for a single control. One path is created for each control and each path associates the unit/process with the respective release point. Path assignment = 1 and control apportionment = 100% for each control device in each of its paths.

Single Control Device on Multiple Units/Processes/Release Points



A path can be shared by units/processes if they all direct their emission through the control(s) in that path and also “share” release points

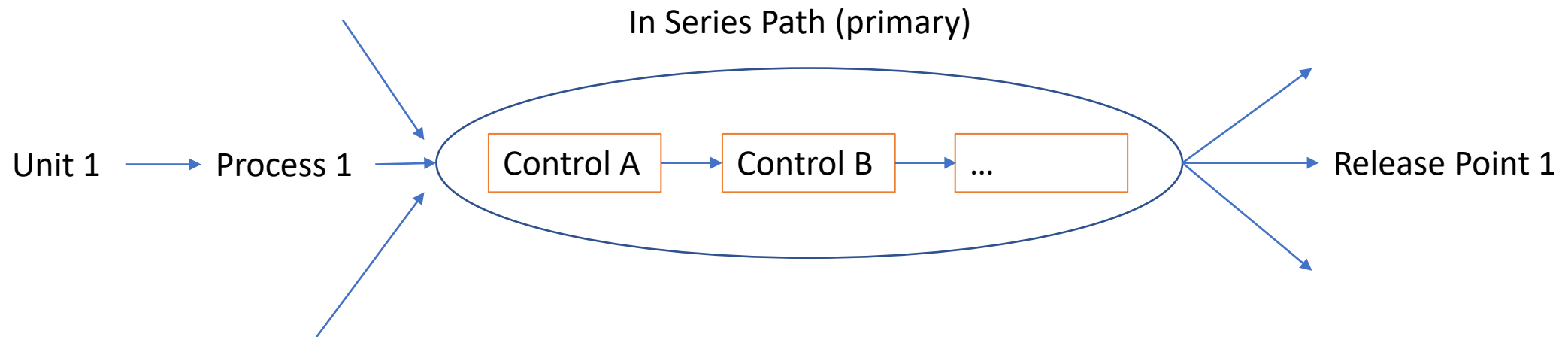
Control Path Assignment

A **Control Path Assignment** defines the order in which control devices are configured, each control or child path is given a sequence number:

- Increasing “sequence number” if in sequence
- The same “sequence number” if in parallel

Multiple Control Devices – In Series

Multiple controls in series can be placed in a path and that path can be reused by many processes going to the same release point(s), if it is the primary path between each process and release point(s), as in the previous slide.



Information You Need: release point apportionment, control effectiveness, pollutant reduction efficiency, *path assignment* (position of control in the sequence; control A=1, Control B=2,...), control apportionment = 100%.

Control Path Assignment in the User Interface

Found in the screen for each existing path.

The screenshot displays the CAERS user interface. At the top, the title is "Combined Air Emissions Reporting System" and the user is identified as "NEI Certifier - JULIAGAMAS". The breadcrumb navigation shows "My Facilities > Emissions Reports > 2021 Emissions Report". The left sidebar contains a menu with options like "Report Facility & Path Information", "Report Summary", "Report History", "Quality Checks", "Report Creation Log", "Monthly Fuel Reporting", "Data Bulk Entry", "Facility Inventory", and "Emissions Inventory". The main content area shows "Report Facility & Path Information" with fields for "Path ID:" and "Path Description:". A modal dialog box titled "Control Path Assignment" is open in the center. It contains the following fields and instructions:

- Enter the Sequence Number* (input field with value "1")
- You must select either a Control or a Control Path* (instructions)
- Control (dropdown menu with "Control A" selected)
- Control Path (empty dropdown menu)
- % Path Apportionment (of Control or Sub-Path)* (input field)

At the bottom of the dialog are "Save" and "Cancel" buttons. Below the dialog, two tables are visible:

Sequence Number	Assignment	% Apportionment

Pollutant Name	Code	CAS ID	% Reduction Efficiency

Control Apportionment

Flow of emissions from one control device to the next will be tracked via the **Control Apportionment**

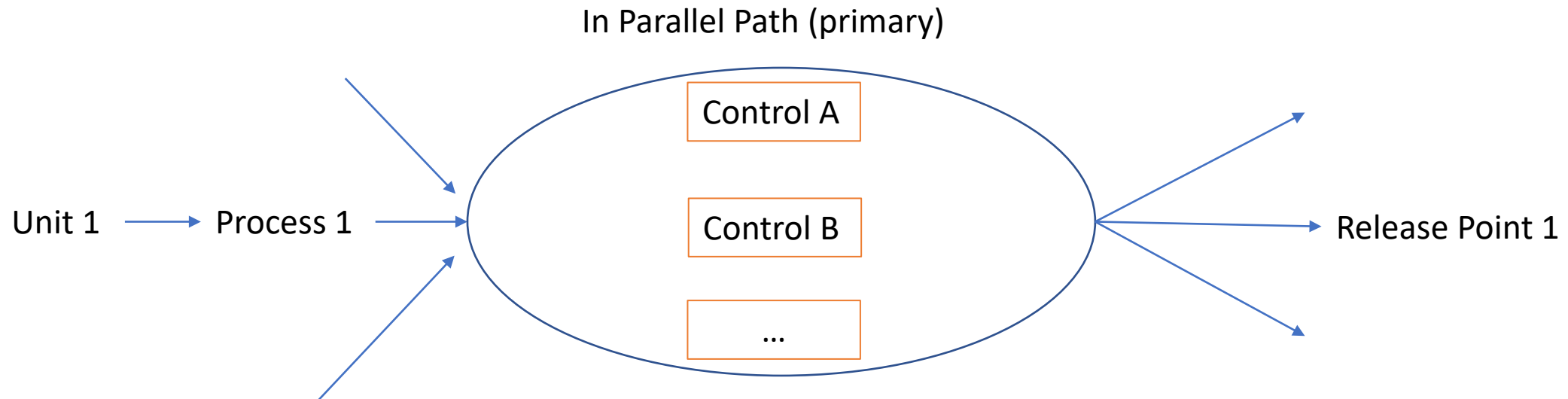
- % of the emissions are routed to the next control or path.
- 100% of the emissions are tracked, a control apportionment percentage < 100% for a control device means that some emission are also being routed to another control device or path.
- Are entered when entering control path assignment data.

Release Point Apportionment (revisited):

- Total uncontrolled emissions generated at the unit/process must be accounted for in terms of where they were ultimately released:
 - Different types of release points
 - Stack
 - Fugitive
 - 100% of the original emissions must be assigned to one or more release points

Multiple Control Devices – In Parallel

Multiple control devices in parallel can be placed in on path and that path can be reused if it is the primary path, so long as it associates units/processes with the same release point(s).



Information You Need: release point apportionment, control effectiveness, pollutant reduction efficiency, path assignment (position of control in the sequence, if parallel, all controls have the same sequence number), control apportionment (e.g. 33% per control).

Control Apportionment in the User Interface

Found in the screen for each existing path.

The screenshot displays the CAERS user interface. A modal window titled "Control Path Assignment" is open, allowing users to configure a control path. The modal includes the following fields and options:

- Enter the Sequence Number***: A text input field containing the value "1".
- You must select either a Control or a Control Path***: A validation message.
- Control**: A dropdown menu currently showing "Control A".
- Control Path**: An empty dropdown menu.
- % Path Apportionment (of Control or Sub-Path)***: An empty text input field.
- Save** and **Cancel** buttons at the bottom right.

The background interface shows the "Control Path Assignment" table with columns for Sequence Number, Assignment, and % Apportionment. Below it is the "Control Path Pollutants" table with columns for Pollutant Name, Code, CAS ID, and % Reduction Efficiency. The left sidebar contains navigation options like "My Facilities", "Emissions Reports", and "Facility Information".

Control Apportionment in the Bulk Upload Template

Found in the “Control Assignments” tab using existing controls and paths.

on marked *. Where a drop-down menu exists, select from the list of options in each menu. All field formats are "General" except where specified.
 Copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters. Note there are hidden columns in this worksheet.
 or hidden columns, as these are important for data validations.
 and control paths before assigning them. To each control path in column D, assign either a control or a path, but not both in the same row.

	Drop down. Select the name (ID) of the control path.	Drop down. Control assigned to the path in D.	Drop down. Child path assigned to the path in D.	The number in the sequence the control or path occupies within a path.	The percentage of emissions from the previous control or path in the sequence, that is directed to this control or path.
	Path ID*	Control ID	Control Path (Child)	Sequence Number*	% Path Apportionment (of Control or Sub-Path)*
	Primary	NOX Control		1	75
	Primary		Secondary	1	25
	Secondary	Control 001		1	100
	Secondary	Control 002		2	100
	Path 1	Control 1		1	

ctions Facility Facility Contacts NAICS Release Points Emission Units Emission Processes Control Devices Control Paths **Control Assignments** Control Device Pollutant

Percent Path Effectiveness

- *Required* on main paths (those associated with a release point apportionment)
- If only one control device exists, it is equal to the percent control effectiveness for that control.
- May depend on how those control devices are laid out (in sequence, parallel, a combination). For example, if in sequence: the multiplication of % control effectiveness, if in parallel: the average or weighted average of control device effectiveness.
- Consult your SLT on the best way to represent path effectiveness, especially if you have a complex control set up.
- Entered in the screen for each path.

Path Effectiveness in the User Interface

Found in the screen for each path.

The screenshot displays the EPA MyCDX interface for a 2021 Emissions Report. The breadcrumb navigation shows 'My Facilities > Emissions Reports > 2021 Emissions Report'. The top right corner contains links for 'CBI Disclaimer', 'CAERS Help', and 'Contact CDX'. A progress bar at the top indicates four steps: 'Report Facility & Emissions Information' (completed), 'Perform Quality Checks', 'Submit to SLT Authority', and 'Approved by SLT Authority'. The main content area is titled 'Control Path Information' and contains the following fields:

- Path ID:** A text input field containing 'Path A'.
- Percent Path Effectiveness:** A text input field.
- Path Description:** A large text area for describing the path.

At the bottom right of the form are 'Cancel' and 'Save' buttons. The left sidebar lists navigation options: Report Summary, Report History, Quality Checks, Report Creation Log, Monthly Fuel Reporting, Data Bulk Entry, Facility Inventory (with sub-items: Facility Information, Emissions Units, Release Points, Control Devices, Control Paths), and Emissions Inventory (with sub-items: A201, B201). The footer contains the text: 'EPA Home | MyCDX | Accessibility Notice | Privacy and Security Notice'.

Path Effectiveness in the Bulk Upload Template

Found in the
“Control Paths”
tab.

2 Enter all information marked *. Where a drop-down menu exists, select from the list of options in each menu. 3 All field formats are "General" except where specified. 4 Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters. 5 Note there are hidden columns in this worksheet. Please do not alter hidden columns, as these are important for data validations. 6 You should enter all control path information before assigning them to other paths or associating them with processes and release points.			
8 Tab: Control Paths			
9	Instruction:	Identifier of the control path, given by the facility.	Description of the control path.
10	Field	Path ID*	Path Description
			Estimated percent of the reporting period's activity for which the overall control system or approach (including both capture and control measures) were operating as designed (regardless of whether the control measure is due to rule or voluntary).
			Percent Path Effectiveness
14	Example Entry	Primary	Primary Control Flow
15	Example Entry	Secondary	Secondary Control Flow
24		Path 1	Unit B202 Process B201 to Release Point RP2
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Path Pollutant Percent Reduction Efficiency

- *Required* on main paths (those associated with a release point apportionment)
- If there is only one control device, then it is the same as the control percent reduction efficiency.
- If there are more than one control device reducing the same pollutant, it is a combination of the reduction efficiency of all those devices.
- May depend on how those control devices are laid out (in sequence, parallel, a combination).
- Consult your SLT to determine the best way to represent path pollutant percent reduction efficiency if you have a complex controls set up.

Path Pollutants in User Interface

The screenshot displays the CAERS user interface. A modal dialog titled "Control Path Pollutant" is open, allowing for the configuration of a pollutant. The "Pollutant" field is set to "Volatile Organic Compounds - VOC" and the "Percent Reduction Efficiency" is set to "85". The background interface includes a navigation menu on the left, facility information, and a table of path pollutants.

Sequence Number	Assignment	% Apportionment		
1	1	100		

Pollutant Name	Code	CAS ID	% Reduction Efficiency	

Can be added in the screen for an existing path.

Path Pollutants in Bulk Upload

1
2 Enter all information marked *. Where a drop-down menu exists, select from the list of options in each menu.
3 All field formats are "General" except where specified.
4 Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters.
5 Note there are hidden columns in this worksheet. Please do not alter hidden columns, as these are important for data validations.
6 Create controls before assigning them pollutants.
7
8 **Tab: Control Path Pollutants**

Instruction:	Drop down. Control Path ID for path the equipment that is controlling the pollutant is assigned.	Drop down. Pollutant the equipment controls.	Efficiency with which the control removes the pollutant.
Field	Path ID*	Pollutant Name*	Percent Reduction Efficiency*
Example Entry	Primary	Acetaldehyde	99.9
Example Entry	Primary	Benzene	99.9
Example Entry	Secondary	Acetaldehyde	5.3
Example Entry	Secondary	Nitrogen Oxides	5.3
	1	Volatile Organic Compounds	96
	2	Sulfur Dioxide	85.5
	2	PM2.5 Filterable	93
	2	PM10 Filterable	93
	3	Volatile Organic Compounds	94

Ready Accessibility: Investigate | Display Settings | 100%

Can be entered, for an existing path, in the “Control Path Pollutants” tab of the bulk upload template.

Overall Percent Control in CAERS

- Not required. Can be entered to help you calculate your facility emissions.
- If entering this amount, you should select a method of calculation that does *not* include controls. CAERS will factor in the overall percent control in your emissions calculation if entered:
 - Single Control Overall Percent Control = percent captured * efficiency * effectiveness.
 - Parallel Controls that control the same pollutant: add individual overall %
 - In Series Controls that control the same pollutant: multiply individual overall % controls
 - Complex Controls that control the same pollutant: may need average, weighted average. Consult your SLT on the best approach.
 - You may also need to factor in control apportionments.

Overall Percent Control in User Interface

Found in the emissions estimation screen.

US EPA - CAERS Combined Air Emissions Reporting System

cdxappstest.epacdx.net/cef-web/#/facility/2049/report/2221/period/39776/emission/167490

My Facilities > Emissions Reports > 2021 Emissions Report

Agency ID: 99999999
Facility Inc.
123 Main Street
Myltown, GA 12345
2021 Emissions Report
Agency: GADNR

Report Summary
Report History
Quality Checks
Report Creation Log
Monthly Fuel Reporting
Data Bulk Entry

Facility Inventory
Facility Information
Emissions Units
Release Points
Control Devices
Control Paths

Emissions Inventory
A201
B201

Report Facility & Emissions Information | Perform Quality Checks | Submit to SLT Authority | Approved by SLT Authority

1. The total emissions for this Emission Process and Pollutant are exactly the same as your 2020 submission. Please check to ensure that the emissions for this year are correct and have not changed.

Process Information					
Unit ID:	A201	Reporting Period:	Annual	Operating Status:	Operating
Process ID:	P201	Throughput Value:	100	Throughput UoM:	TONS
Throughput Material:	Anthracite	Fuel Value:		Fuel UoM:	TONS
Throughput Parameter:	Input	Heat Content Ratio:	25.09	Heat Content Ratio Numerator:	MILLION BTUS
Fuel Material:	Anthracite				

Emission Information			
Pollutant:	Carbon Monoxide - CO - 630-08-0	Pollutant Code:	CO
Pollutant Name:	Carbon Monoxide	CAS ID:	630-08-0
Calculation Method:	Site-Specific Emission Factor (no Control Efficiency used)		
Emission Factor:	0.5	Emission Factor Description:	Established through stack tests. See Document X page 10 table 5.
Emission Factor Numerator UoM:		Emission Factor Source:	
Overall Control %:		Emission Factor Denominator UoM:	TON
Total Emissions:		Emissions UoM:	TON

I prefer to calculate the total emissions of this pollutant.

Comments:

Calculate Emissions | Cancel | Save

Overall Percent Control in the Bulk Upload Template

Enter all information marked *. Where a drop-down menu exists, select from the list of options in each menu. All field formats are "General" except where specified.
 Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters.
 Enter all reporting period information before working on this tab.

Tab: Emissions

Instruction:	Drop down. The unit, process, and reporting period reference.	Drop down. Pollutant from the process in the reporting year.	Drop down. Select "true" if no emission factor exists, or the units of measure of the denominator of the available emission factor do not match your throughput units of measure.	Total emissions for the pollutant.	Drop down. Units of measure of the emissions.	The overall percent of the pollutant that is removed by the controls in the path from the process to the release point.	Emission factor for the calculation.	Description of the
Field	Reporting Period*	Pollutant Name*	I prefer to calculate this emission myself	Total Emissions*	Emissions Unit of Measure*	Overall Control %	Emissions Factor	Emissions Factor
Example Entry	ML05-1-Annual	Acetaldehyde	false	1000	TON			6.200E-2 Lb per 1
Example Entry	SCR-1-Annual	Benzene	false	1007.75	TON		0.592	5.900E-2 Lb per 1
Example Entry	SCR-2-Annual	Nitrogen Oxides	true	2015.6	TON		0.6	
	B201-P201-Annual	Carbon Monoxide	false	0.0294	TON			0.6 This factor was pr
	B201-P201-Annual	Nitrogen Oxides	false	0.882	TON			18 EPA, 1996. Secti
	B201-P201-Annual	Volatile Organic Compounds	false	0.00343	TON			0.07 This factor was pr
	B202-P202-1-Annual	Carbon Monoxide	false	30	TON			
	B202-P202-1-Annual	PM2.5 Filterable	true	200	LB			PM Calculator. E
	B202-P202-Annual	Nitrogen Oxides	false	30	TON			

Found in the "Emissions" tab and can be entered for an existing unit/process and pollutant.

Steps to Enter Data

General Data Entry Steps for Control Devices and Paths in CAERS

1. Ensure unit/process and release point data are available.
2. Enter control device data: effectiveness, pollutant and % pollutant reduction efficiency
3. Place the control into a path: assignment (sequence #), control apportionment
 - Control into path
 - Child path into parent path
 - Controls and/or children paths into a primary path
 - Associated efficiency and effectiveness
4. Apportion emissions from the process to the release point (release point apportionment)
5. If using overall % control, calculate and enter that information.

Control Data in User Interface

Select Control Devices and Add New Control Device

Agency ID: 12345678
FACILITY INC
123 Main Street
Mytown, GA 12345

Report Summary
Report History
Quality Checks
Data Bulk Entry
▼ Facility Inventory
 Facility Information
 Emissions Units
 Release Points
 Control Devices
 Control Pairs
▼ Emissions Inventory
 ▶ Boiler 1
 ▶ Boiler 2
 Coal Furnace
 Spray Booth A
 Test
 ▶ Test B Boiler
 ▶ Test Boiler 1
 ▶ Test Boiler C
 ▶ Turbine 1

Report Facility & Emissions Information Perform Quality Checks Submit to SLT Authority Approved by SLT Authority

Control Device Information

Control ID:	Control A	Operating Status:	Operating
Control Measure:	Selective Non-catalytic Reduction (SNCR)	Operating Status Year:	2020
Control Description:	SNCR For Test Boiler 1 processes		
Control Number Operating Months:	12	Percent Control Effectiveness:	
Control Start Date:	2018-12-01	Control Upgrade Date:	yyyy-mm-dd
Control End Date:	yyyy-mm-dd		
Control Upgrade Description:			
Comments:			

Cancel Save

See New Control in List of Control Devices

Agency ID:12345678
FACILITY INC
123 Main Street
Mytown, GA 12345

- Report Summary
- Report History
- Quality Checks
- Data Bulk Entry
- ▼ Facility Inventory
 - Facility Information
 - Emissions Units
 - Release Points
 - Control Devices ◀
 - Control Paths
- ▼ Emissions Inventory
 - ▶ Boiler 1
 - ▶ Boiler 2
 - Coal Furnace
 - Spray Booth A
 - Test
 - ▶ Test B Boiler
 - ▶ Test Boiler 1
 - ▶ Test Boiler C
 - ▶ Turbine 1

Report Facility & Emissions Information Perform Quality Checks Submit to SLT Authority Approved by SLT Authority

Control Devices

Control ID	Control Description	Operating Status	
Control 1	test control 1	Operating	🗑️
Control 2	test control 2	Operating	🗑️
Control 3	test control 3	Operating	🗑️
Control 4	test control 4	Operating	🗑️
Control 5	test control 5	Operating	🗑️
Control A	SNCR For Test Boiler 1 processes	Operating	🗑️
			+

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Select Control Device and Add Pollutant Data

The screenshot displays the EPA MyCDX interface. On the left is a navigation sidebar for 'FACILITY INC' (123 Main Street, Mytown, GA 12345) with sections for Report Summary, Report History, Quality Checks, Data Bulk Entry, Facility Inventory, and Emissions Inventory. The main content area is titled 'Control Device Information' and includes fields for Control ID, Control Measure, Control Description, Control Number, Months, Control Start Date, Control Upgrade Description, and Comments. An 'Edit' button is in the top right. A modal dialog titled 'Control Device Pollutant' is open, showing a 'Pollutant' dropdown set to 'Nitrogen Oxides - NOX' and a 'Percent Reduction Efficiency' input field set to '90'. The dialog has 'Save' and 'Cancel' buttons. Below the dialog, a table titled 'Control Device Pollutants' has columns for 'CAS ID' and '% Reduction Efficiency'. At the bottom, a section titled 'Paths Associated with this Control' contains a table with columns for 'Path Identifier' and 'Path Description'. The footer contains the text 'EPA Home | MyCDX | Accessibility Notice | Privacy and Security Notice'.

Select Control Paths and Add New Path

Agency ID:12345678
FACILITY INC
123 Main Street
Mytown, GA 12345

Report Summary
Report History
Quality Checks
Data Bulk Entry
▼Facility Inventory
Facility Information
Emissions Units
Release Points
Control Devices
Control Paths
▼Emissions Inventory
▶ Boiler 1
▶ Boiler 2
Coal Furnace
Spray Booth A
Test
▶ Test B Boiler
▶ Test Boiler 1
▶ Test Boiler C
▶ Turbine 1

Report Facility & Emissions Information Perform Quality Checks Submit to SLT Authority Approved by SLT Authority

Control Path Information

Path ID: Path A Percent Control Effectiveness: 97

Path Description: Test Boiler 1 Test 1

Cancel Save

See New Path in List of Paths

Agency ID:12345678
FACILITY INC
123 Main Street
Mytown, GA 12345

- Report Summary
- Report History
- Quality Checks
- Data Bulk Entry
- ▼ Facility Inventory
 - Facility Information
 - Emissions Units
 - Release Points
 - Control Devices
 - Control Paths ◀
- ▼ Emissions Inventory
 - ▶ Boiler 1
 - ▶ Boiler 2
 - Coal Furnace
 - Spray Booth A
 - Test
 - ▶ Test B Boiler
 - ▶ Test Boiler 1
 - ▶ Test Boiler C
 - ▶ Turbine 1

Report Facility & Emissions Information Perform Quality Checks Submit to SLT Authority Approved by SLT Authority

Control Paths

Path Id	Path Description	
Path 1	test path 1	🗑️
Path 2	test path 2	🗑️
Path 3	test path 3	🗑️
Path 4	test path 4	🗑️
Path 5	test path 5	🗑️
Path A	Test Boiler 1 Test 1	🗑️
		+

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Select Path and Add Data

Agency ID:12345678
FACILITY INC
123 Main Street
Mytown, GA 12345

Report Summary

Report History

Quality Checks

Data Bulk Entry

▼Facility Inventory

- Facility Information
- Emissions Units
- Release Points
- Control Devices
- Control Paths

▼Emissions Inventory

- ▶ Boiler 1
- ▶ Boiler 2
- Coal Furnace
- Spray Booth A
- Test
- ▶ Test B Boiler
- ▶ Test Boiler 1
- ▶ Test Boiler C
- ▶ Turbine 1

Report Facility & Emissions Information

Perform Quality Checks

Submit to SLT Authority

Approved by SLT Authority

Control Path Information

Edit

Path ID:	Path A	Percent Control Effectiveness:	97
Path Description:	Test Boiler 1 Test 1		

Control Path Assignment

Sequence Number	Assignment	% Apportionment	
			+

Control Path Pollutants

Pollutant Name	Code	CAS ID	% Reduction Efficiency	
				+

Control Path Assignment Data

Agency ID:12345678
FACILITY INC
123 Main Street
Mytown, GA 12345

Report Summary
Report History
Quality Checks
Data Bulk Entry
▼Facility Inventory
Facility Information
Emissions Units
Release Points
Control Devices
Control Paths
▼Emissions Inventory
▶ Boiler 1
▶ Boiler 2
Coal Furnace
Spray Booth A
Test
▶ Test B Boiler
▶ Test Boiler 1
▶ Test Boiler C
▶ Turbine 1

Report Facility & Emissions Information Perform Quality Checks Submit to SLT Authority Approved by SLT Authority

Path ID:
Path Description:
Sequence Number

Control Path Assignment

Enter the Sequence Number: 1

You must select either a Control or a Control Path:

Control: Control A Control Path:

Enter the Apportionment Percentage: 100

Save Cancel

Control Path Pollutants

CAS ID	% Reduction Efficiency

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Add Control Path Pollutants

Agency ID:12345678
FACILITY INC
123 Main Street
Mytown, GA 12345

Report Summary

Report History

Quality Checks

Data Bulk Entry

▼Facility Inventory

Facility Information

Emissions Units

Release Points

Control Devices

Control Paths

▼Emissions Inventory

▶ Boiler 1

▶ Boiler 2

Coal Furnace

Spray Booth A

Test

▶ Test B Boiler

▶ Test Boiler 1

▶ Test Boiler C

Report Facility & Emissions Information

Perform Quality Checks

Submit to SLT Authority

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Control Path Information

Edit

Path ID: Path A Percent Control Effectiveness: 97

Path Description: Test Boiler 1 Test 1

Control Path Assignment

Sequence Number	Assignment	% Apportionment		
1	Control A	100		
+				

Control Path Pollutants

Pollutant Name	Code	CAS ID	% Reduction Efficiency		
Nitrogen Oxides	NOX		90		
+					

Select the Process for the Control Device

- ▶ Boiler 1
- ▶ Boiler 2
- Coal Furnace
- Spray Booth A
- Test
- ▶ Test B Boiler
- ▶ Test Boiler 1
- ▶ Test Boiler C
- ▶ Turbine 1

Avg. Hours per Day:	8	Winter Operating Percent:	25	Summer Operating Percent:	25
Avg. Weeks per Year:	50	Spring Operating Percent:	25	Fall Operating Percent:	25

Edit

Reporting Period:	Annual	Operating Type:	Routine	Throughput Parameter:	Input
Throughput Material:	Anthracite	Throughput Value:	100	Throughput UoM:	TONS
Fuel Material:	Anthracite	Fuel Value:	100	Fuel UoM:	TONS
		Heat Content Ratio:	25.09	Heat Content Ratio Numerator:	MILLION BTUS

Comments: for demo

Emissions Associated with this Process

Pollutant Name	Code	CAS ID	
Nitrogen Oxides	NOX		🗑️
			+

Release Points Associated with this Process

Release Point	Release Type	Control Path	%	
Total % Apportionment of Emissions			0%	+

Note: Each process must allocate exactly 100% of its emissions to one or more release points before the report can be submitted.

Controls Associated with this Process

Control	Description	Control Path

Select Release Point for that Process

The screenshot displays a web application interface for configuring process parameters. A modal window titled "Release Point Apportionment" is open, allowing the user to select a release point and control path, and enter an emission percentage. The background shows process details for "Boiler 1" and "Boiler 2", including reporting periods and throughput parameters.

Release Point Apportionment Modal:

- Select a Release Point:
- Select a Control Path (optional):
- Enter the Emission Percentage:
- Buttons: Save, Cancel

Process Details (Boiler 1):

- Avg. Hours per Day: 8
- Avg. Weeks per Year: 50
- Winter Operating Percent: 25
- Spring Operating Percent: 25
- Summer Operating Percent: 25
- Fall Operating Percent: 25

Throughput Parameters:

- Throughput Parameter: Input
- Throughput UoM: TONS
- Fuel UoM: TONS
- Heat Content Ratio: MILLION BTUS
- Numerator: (empty)

Emissions Associated with this Process:

Pollutant Name	Control Path	%
Nitrogen Oxides	NOX	0%

Release Points Associated with this Process:

Release Point	Release Type	Control Path	%
Total % Apportionment of Emissions			
			0%

Note: Each process must allocate exactly 100% of its emissions to one or more release points before the report can be submitted.

Controls Associated with this Process:

Control	Description	Control Path
---------	-------------	--------------

Footer: EPA Home | MyCDX | Accessibility Notice | Privacy and Security Notice

Associate Process and Release Point

The screenshot displays a web application interface for managing process emissions. A modal window titled "Release Point Apportionment" is open, allowing the user to associate a process with a release point and specify the emission percentage.

Release Point Apportionment Modal:

- Select a Release Point: Fugitive A - Fugitive Building A
- Select a Control Path (optional): Path A
- Enter the Emission Percentage: 15
- Buttons: Save, Cancel

Background Interface Details:

- Reporting Period:** Annual
- Operating Type:** Routine
- Throughput Parameter:** Input
- Throughput UoM:** TONS
- Fuel UoM:** TONS
- Heat Content Ratio Numerator:** MILLION BTUS
- Comments:** for dem...
- Process Name:** Test Boiler 1
- Pollutant Name:** Nitrogen Oxides
- Release Points Associated with this Process:**

Release Type	Control Path	%		
Vertical	Path A	85%		
Apportionment of Emissions		85%		
- Controls Associated with this Process:**

Control	Description	Control Path
Control A	SNCR For Test Boiler 1 processes	Path A

Note: Each process must allocate exactly 100% of its emissions to one or more release points before the report can be submitted.

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See Release Point(s) Linked to Process and Associated Paths

- Coal Furnace
- Spray Booth A
- Test
- ▶ Test B Boiler
- ▶ Test Boiler 1
- ▶ Test Boiler C
- ▶ Turbine 1

Reporting Period Edit

Reporting Period:	Annual	Operating Type:	Routine	Throughput Parameter:	Input
Throughput Material:	Anthracite	Throughput Value:	100	Throughput UoM:	TONS
Fuel Material:	Anthracite	Fuel Value:	100	Fuel UoM:	TONS
		Heat Content Ratio:	25.09	Heat Content Ratio Numerator:	MILLION BTUS

Comments: for demo

Emissions Associated with this Process

Pollutant Name	Code	CAS ID	
Nitrogen Oxides	NOX		🗑️
			+

Release Points Associated with this Process

Release Point	Release Type	Control Path	%		
Fugitive A	Fugitive	Path A	15%	✎️	🗑️
Stack 1	Vertical	Path A	85%	✎️	🗑️
Total % Apportionment of Emissions			100%	+	

Note: Each process must allocate exactly 100% of its emissions to one or more release points before the report can be submitted.

Controls Associated with this Process

Control	Description	Control Path
Control A	SNCR For Test Boiler 1 processes	Path A

Can Use Pre-Control Emission Factor

Throughput Material:	Anthracite	Throughput Value:	100	Throughput UoM:	TONS
Throughput Parameter:	Input	Fuel Value:	100	Fuel UoM:	TONS
Fuel Material:	Anthracite	Heat Content Ratio:	25.09	Heat Content Ratio Numerator:	MILLION BTUS

Emission Information			
❓ Pollutant:	Nitrogen Oxides - NOX	❓ Pollutant Code:	NOX
❓ Pollutant Name:	Nitrogen Oxides	❓ CAS ID:	
❓ Calculation Method:	USEPA Emission Factor (no Control Efficiency used)		
❓ Emission Factor:	3	❓ Emission Factor Description:	This factor was present in AIRS Facility Subsystem Source Classification Codes
❓ Emission Factor Numerator UoM:	LB	❓ Emission Factor Denominator UoM:	TON
❓ Overall Control %:	74	❓ Emissions UoM:	LB
❓ Total Emissions:	78	<input type="checkbox"/> I prefer to calculate the total emissions of this pollutant.	
Comments:			

Buttons: Calculate Emissions, Cancel, Save

You must add control equipment to use the overall control %

Or, Can Use Post-Control Emission Factor

Agency ID:12345678
FACILITY INC
123 Main Street
Mytown, GA 12345

- Report Summary
- Report History
- Quality Checks
- Data Bulk Entry
- ▼ Facility Inventory
 - Facility Information
 - Emissions Units
 - Release Points
 - Control Devices
 - Control Paths
- ▼ Emissions Inventory
 - ▶ Boiler 1
 - ▶ Boiler 2
 - Coal Furnace
 - Spray Booth A
 - Test
 - ▶ Test B Boiler
 - ▶ Test Boiler 1
 - ▶ Test Boiler C
 - ▶ Turbine 1

Report Facility & Emissions Information

Perform Quality Checks

Submit to SLT Authority

Approved by SLT Authority

Process Information

Unit ID:	Test Boiler 1	Reporting Period:	Annual	Operating Status:	Operating
Process ID:	Test 1	Throughput Value:	100	Throughput UoM:	TONS
Throughput Material:	Anthracite	Fuel Value:	100	Fuel UoM:	TONS
Throughput Parameter:	Input	Heat Content Ratio:	25.09	Heat Content Ratio Numerator:	MILLION BTUS
Fuel Material:	Anthracite				

Emission Information

❓ Pollutant:	Nitrogen Oxides - NOX	❓ Pollutant Code:	NOX
❓ Pollutant Name:	Nitrogen Oxides	❓ CAS ID:	
❓ Calculation Method:	Vendor Emission Factor (pre-control) plus Control Efficiency		
❓ Emission Factor:	3	❓ Emission Factor Description:	AP42 Text: Section...
❓ Emission Factor Numerator UoM:	LB	❓ Emission Factor Denominator UoM:	TON
❓ Overall Control %:		❓ Emissions UoM:	LB
❓ Total Emissions:	300	<input type="checkbox"/> I prefer to calculate the total emissions of this pollutant.	
Comments:			

If using post control factor, do not enter Overall Control %

Calculate Emissions Cancel Save

Control Device in Bulk Upload

Enter Data in Control Devices Tab

4 paths.
 5 s that should not be changed if they existed in a previous submission.
 6 s year should not be deleted, but instead, the user should change their operating status to "Permanently Shutdown".
 7
 8

Description of the control equipment.	Estimated percent of the reporting period's activity for which the overall control system or approach (including both capture and control measures) were operating as designed (regardless of whether the control measure is due to rule or voluntary).	Drop down. Code that identifies the operating status of the control measure.	Year the current operating status came into effect.	Drop down. Control measure code.	The number of months per year the control operates.	Day the control was made effective.	The date on which the control was most recently upgraded.
Control Description*	Percent Control Effectiveness	Operating Status*	Operating Status Year	Control Measure*	Control Number Operating Months	Control Start Date	Control Upgrade Date
Acetaldehyde and Benzene Control	50	Operating	1985	Wet Scrubber - High Efficiency	12	2019-10-31	
Acetaldehyde Control	75	Operating	1985	Wet Scrubber - Medium Efficiency			
NOX Capture Device	75	Operating	1985	Gas Scrubber (General, Not Classified)			
test control 1	25	Operating	2000	Afterburner			
test control 2	25	Operating	2000	Adsorption - Activated Carbon or other			
test control 3	25	Operating	2000	Air Injection			
test control 4	25	Operating	2000	Internal Floating Roof			
test control 5	25	Operating	2000	Screen			
SNCR For Test Boiler 1 processes		Operating	2020	Selective Non-catalytic Reduction (SNCR	12	2018-12-01	

Instructions Facility Facility Contacts NAICS Release Points Emission Units Emission Processes Control Devices Control Paths Control Assignments Control Device Pollutants ...

Average: 445 Count: 11 Sum: 2225 Display Settings 100%

Enter Data in the Control Paths Tab

Field	Path ID*	Path Description*	Percent Control Effectiveness
example entry	Primary	Primary Control Flow	50
	Secondary	Secondary Control Flow	75
	Path 1	test path 1	2
	Path 2	test path 2	3
	Path 3	test path 3	4
	Path 4	test path 4	5
	Path 5	test path 5	6
	Path A	Test Boiler 1 Test 1	97

Estimated percent of the reporting period's activity for which the overall control system or approach (including both capture and control measures) were operating as designed (regardless of whether the control measure is due to rule or voluntary).

Instructions: Identifier of the control path, given by the facility. Description of the control path.

4 Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters.
 5 Note there are hidden columns in this worksheet. Please do not alter hidden columns, as these are important for data validations.
 6 You should enter all control path information before assigning them to other paths or associating them with processes and release points.

7
 8 Tab: Control Paths

9

10

14

15

24

25

26

27

28

29

30

31

32

33

Instructions Facility Facility Contacts NAICS Release Points Emission Units Emission Processes Control Devices Control Paths Control Assignments Control Device Pollutants

Average: 50 Count: 5 Sum: 150 Display Settings

Enter Data in the Control Assignments Tab

1

2 Enter all information marked *. Where a drop-down menu exists, select from the list of options in each menu. All field formats are "General" except where specified.

3 Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters. Note there are hidden columns in this worksheet.

4 Please do not alter hidden columns, as these are important for data validations.

5 Create all controls and control paths before assigning them. To each control path in column D, assign either a control or a path, but not both in the same row.

6

7

8 **Tab: Control Assignments**

Instruction:	Drop down. Select the name (ID) of the control path.	Drop down. Control assigned to the path in D.	Drop down. Child path assigned to the path in D.	The number in the sequence the control or path occupies within a path.	The percentage of emissions from the previous control or path in the sequence, that is directed to this control or path.
Field	Path ID*	Control ID	Control Path (Child)	Sequence Number*	Percent Apportionment*
example entry	Primary	NOX Control		1	75
	Primary		Secondary	1	25
	Secondary	Control 001		1	100
	Secondary	Control 002		2	100
	Path 1	Control 1		1	50
	Path 1		Path 2	1	50
	Path 2	Control 2		1	50
	Path 2		Path 3	1	50
	Path 3	Control 3		1	50
	Path 3		Path 4	1	50
	Path 4	Control 4		1	50
	Path 4		Path 5	1	50
	Path 5	Control 5		1	100
	Path A	Control A		1	100

34

35

36

37

38

39

Instructions Facility Facility Contacts NAICS Release Points Emission Units Emission Processes Control Devices Control Paths **Control Assignments** Control Device Pollutants ... +

Average: 38.4 Count: 8 Sum: 192 Display Settings

Enter Data in the Control Device Pollutant Tab

3 All field formats are "General" except where specified. 4 Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters. 5 Note there are hidden columns in this worksheet. Please do not alter hidden columns, as these are important for data validations. 6 Create controls before assigning them pollutants. 7 8 Tab: Control Device Pollutants			
Instruction:	Drop down. Control ID for the equipment that is controlling the pollutant.	Drop down. Pollutant the equipment controls.	Efficiency with which the control removes the pollutant.
Field	Control ID*	Pollutant Name*	Percent Reduction Efficiency
example entry	Control 001	Acetaldehyde	99.9
	Control 002	Benzene	99.9
	Control 001	Acetaldehyde	5.3
	NOX Control	Nitrogen Oxides	5.3
	Control 1	1,1,2,2-Tetrachloroethane	25
	Control 2	Carbon Dioxide	99.9
	Control 3	Carbon Monoxide	98.999
	Control 4	Nitrogen Oxides	5
	Control 5	Diethylene Glycol Monovinyl Ether	99.899
	Control A	Nitrogen Oxides	90

Enter All Pollutants if More than One

3 All field formats are "General" except where specified.
 4 Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters.
 5 Note there are hidden columns in this worksheet. Please do not alter hidden columns, as these are important for data validations.
 6 Create controls before assigning them pollutants.
 7
 8 Tab: Control Device Pollutants

9 Instruction:	Drop down. Control ID for the equipment that is controlling the pollutant.	Drop down. Pollutant the equipment controls.	Efficiency with which the control removes the pollutant.
10 Field	Control ID*	Pollutant Name*	Percent Reduction Efficiency
14 example entry	Control 001	Acetaldehyde	99.9
15	Control 002	Benzene	99.9
16	Control 001	Acetaldehyde	5.3
17	NOX Control	Nitrogen Oxides	5.3
24	Control 1	1,1,2,2-Tetrachloroethane	25
25	Control 2	Carbon Dioxide	99.9
26	Control 3	Carbon Monoxide	98.999
27	Control 4	Nitrogen Oxides	5
28	Control 5	Diethylene Glycol Monovinyl Ether	99.899
29	Control A	Nitrogen Oxides	90
30	Control A	Toluene	30
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			

Ready Average: 15588.57143 Count: 12 Sum: 109120 Display Settings 100%

Enter Data in the Apportionment Tab

1

3 Enter all information marked *. Where a drop-down menu exists, select from the list of options in each menu. All field formats are "General" except where specified.

4 Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters.
Enter all release points before apportioning emissions to them.

5

8 **Tab: Apportionment**

9	Instruction:	Drop down. Identifier of the release point that the process emissions are being apportioned to.	Drop down. The process from which emissions are being apportioned to the release point.	Drop down. The path through which emissions flow from the process to the release point.	The percent of process emissions that are ultimately routed to the release point.
10	Field	Release Point ID*	Process ID*	Control Path ID	% Release Point Apportionment*
14	Example Entry	Smokestack 1	Drying Process	Primary	33
15	Example Entry	Smokestack 2	Drying Process	Primary	33
16	Example Entry	Vent 1	Drying Process	Primary	34
17	Example Entry	Smokestack 1	Disposal Process		60
18	Example Entry	Smokestack 2	Disposal Process		40
19	Example Entry	Vent 1	Storage Process		10
20	Example Entry	Smokestack 1	Storage Process		20
21	Example Entry	Smokestack 2	Storage Process		70
24		RP2	A201-P201		97
25		RP2	B201-P201		97
26		RP2	B202-P202		98
27		RP4	A201-P201		3
28		RP4	B201-P201		3
29		RP4	B202-P202		2
30					
31					
32					
33					
34					
35					
36					
37					
38					

Ready

Control Devices | Control Paths | Control Assignments | Control Device Pollutants | Control Path Pollutants | **Apportionment** | Reporting Period

Display Settings

List Pollutants in Emissions Tab

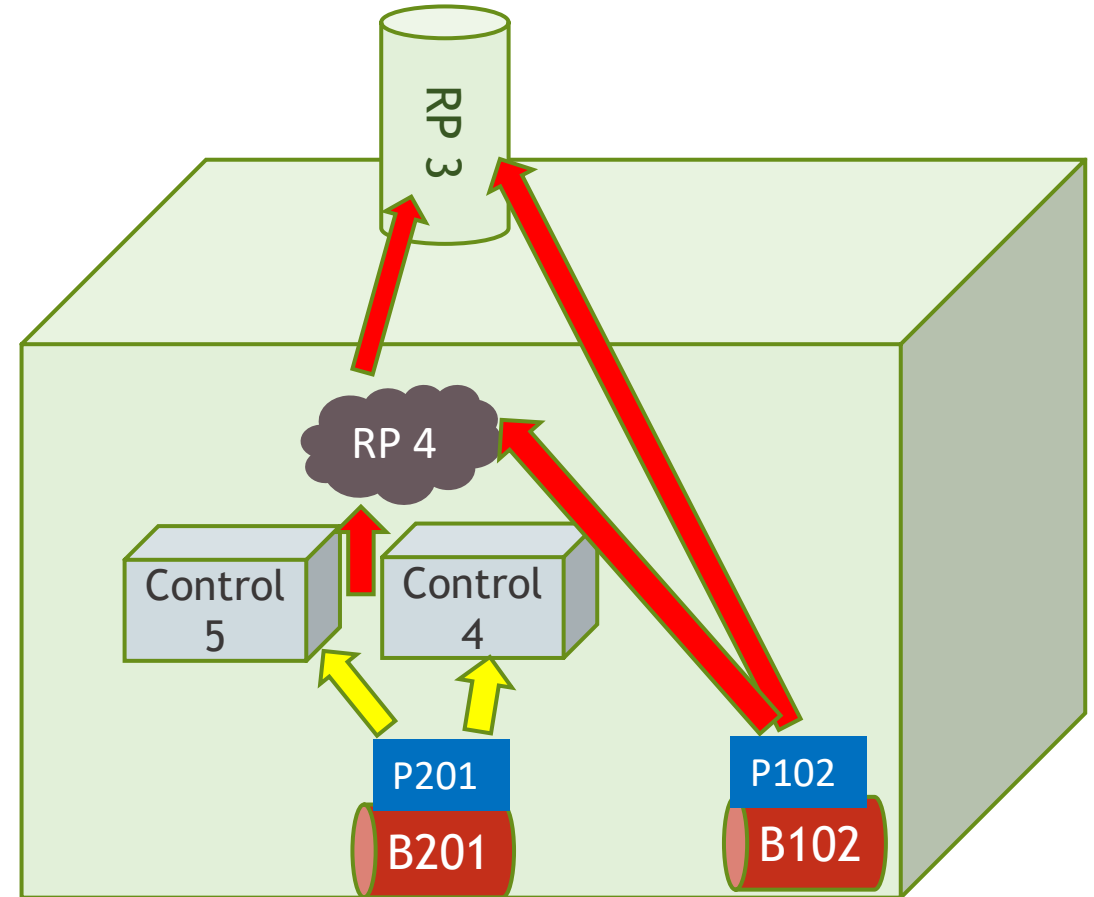
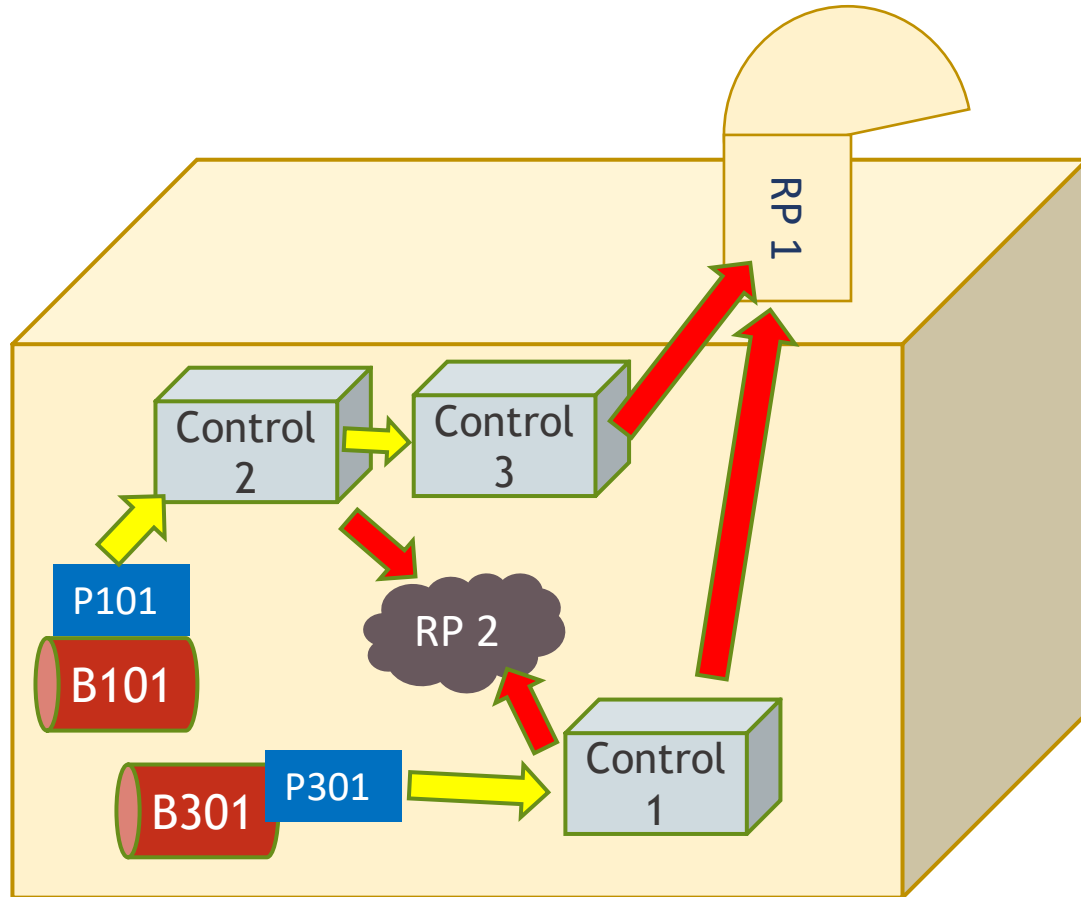
<p>1</p> <p>3 Enter all information marked *. Where a drop-down menu exists, select from the list of options in each menu. All field formats are "General" except where specified.</p> <p>4 Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters.</p> <p>5 Enter all reporting period information before working on this tab.</p> <p>8 Tab: Emissions</p>								
Instruction:	Drop down. The unit, process, and reporting period reference.	Drop down. Pollutant from the process in the reporting year.	Drop down. Select "true" if no emission factor exists, or the units of measure of the denominator of the available emission factor do not match your throughput units of measure.	Total emisisions for the pollutant.	Drop down. Units of measure of the emissions.	The overall percent of the pollutant that is removed by the controls in the path from the process to the release point.	Emission factor for the calculation.	Description of the
Field	Reporting Period*	Pollutant Name*	I prefer to calculate this emission myself	Total Emissions*	Emissions Unit of Measure*	Overall Control %	Emissions Factor	Emissions Factor
Example Entry	ML05-1-Annual	Acetaldehyde	false	1000	TON			6.200E-2 Lb per 1
Example Entry	SCR-1-Annual	Benzene	false	1007.75	TON		0.592	5.900E-2 Lb per 1
Example Entry	SCR-2-Annual	Nitrogen Oxides	true	2015.6	TON		0.6	
	B201-P201-Annual	Carbon Monoxide	false	0.0294	TON			0.6 This factor was pr
	B201-P201-Annual	Nitrogen Oxides	false	0.882	TON			18 EPA, 1996. Sectio
	B201-P201-Annual	Volatile Organic Compounds	false	0.00343	TON			0.07 This factor was pr
	B202-P202-1-Annual	Carbon Monoxide	false	30	TON			
	B202-P202-1-Annual	PM2.5 Filterable	true	200	LB			PM Calculator. Ef
	B202-P202-Annual	Nitrogen Oxides	false	30	TON			

Considerations to Keep in Mind

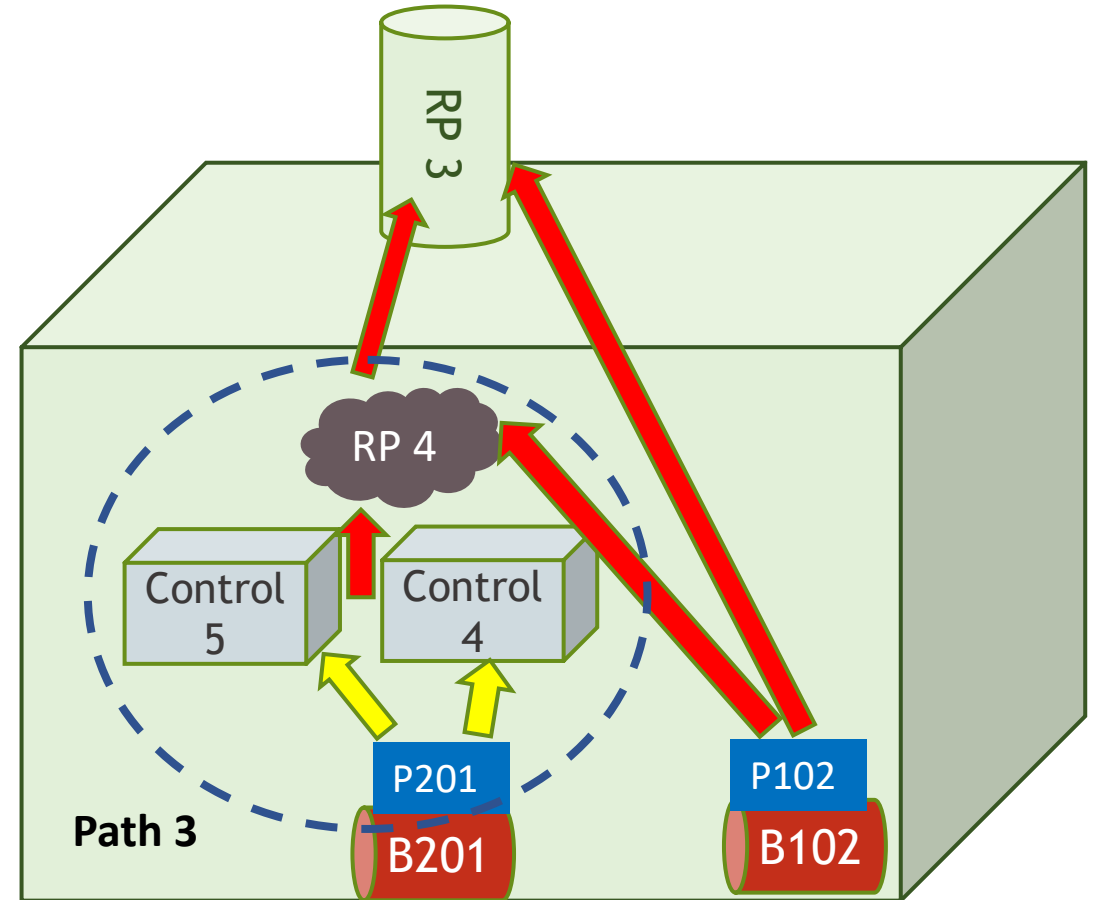
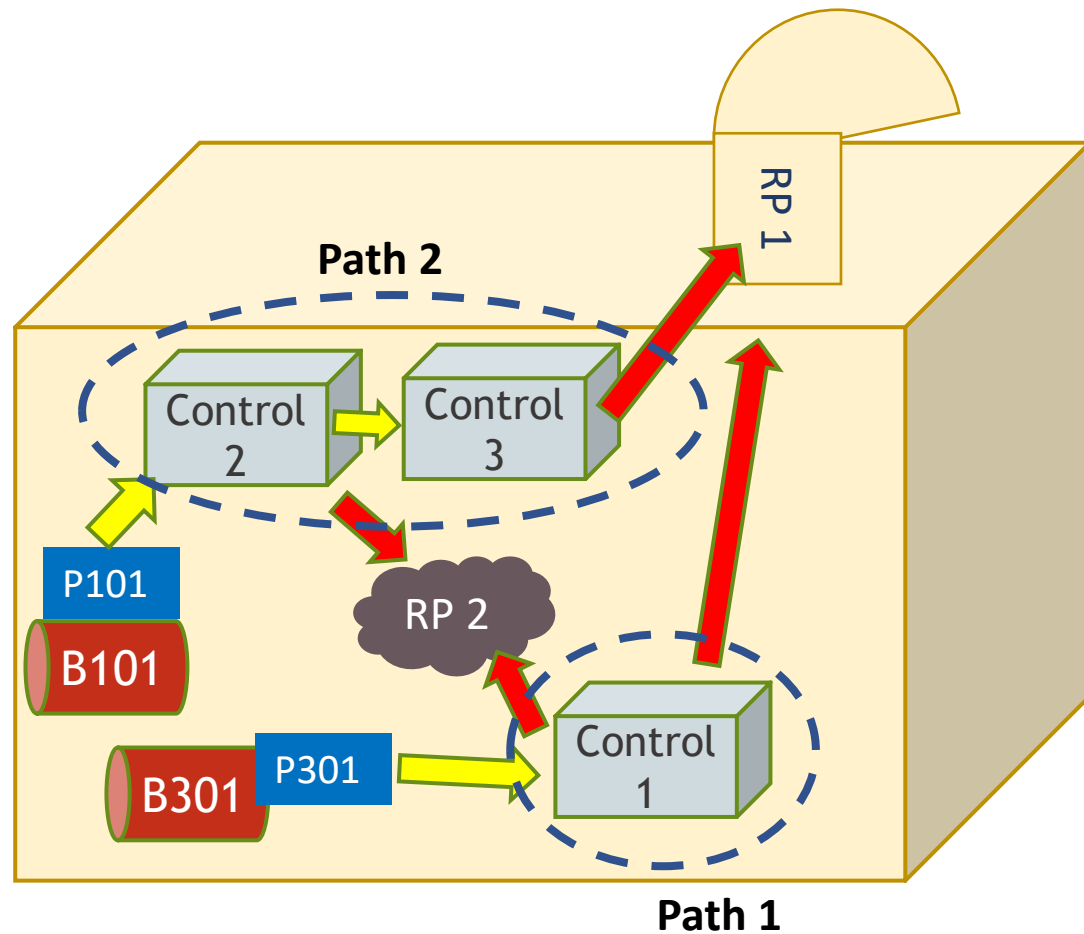
- Please don't re-label or delete controls that existed in a previous year report, instead, mark them as "Permanently Shut Down" or your inventory in EPA will be out of sync. Seeking input on when/how/why facilities relabel components, send to caer@epa.gov.
- You could enter your control data in UI to help guide you, then download in BU template to continue the rest of your report and vice-versa.

Examples

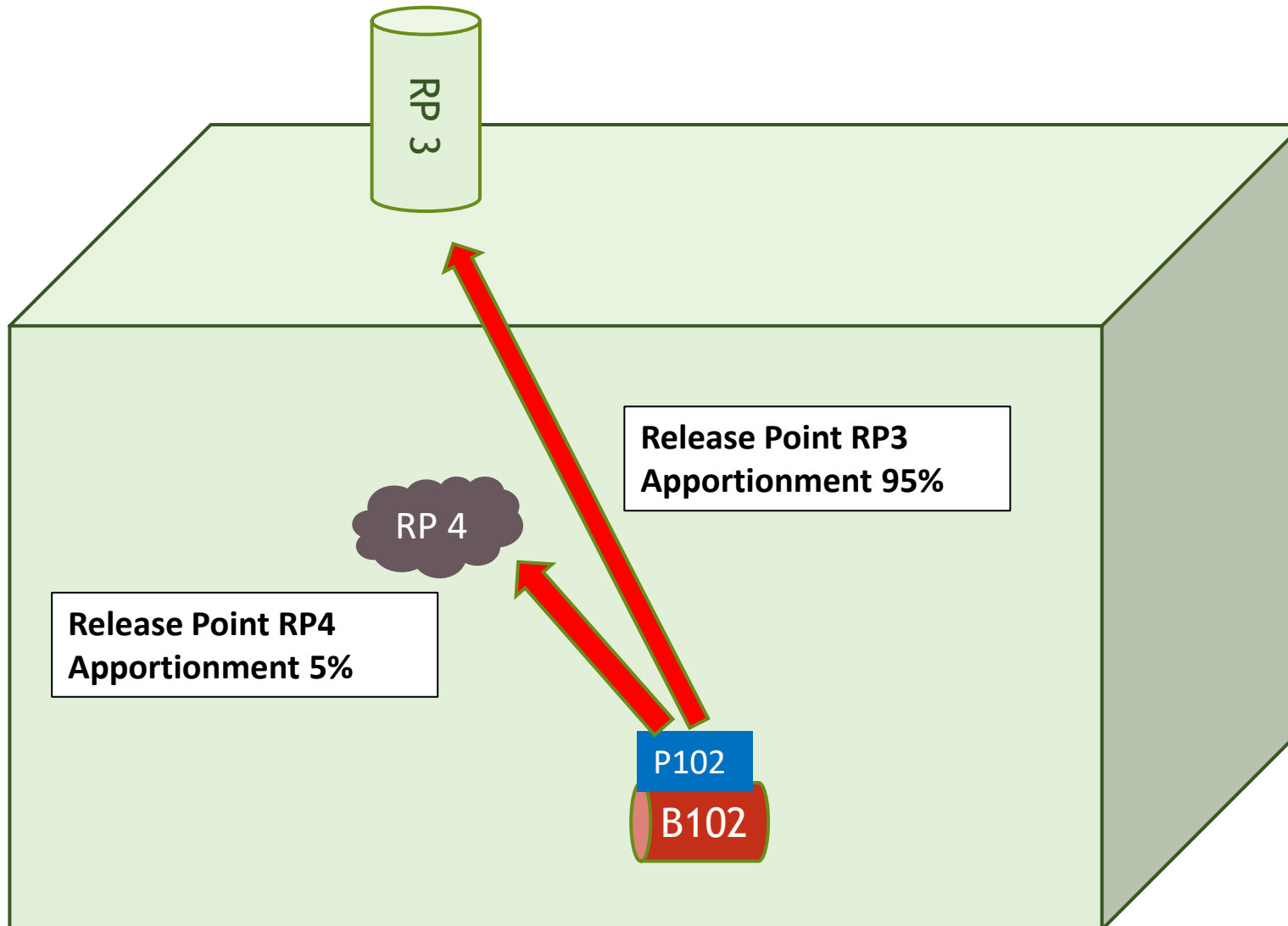
Example Facility with Many Configurations



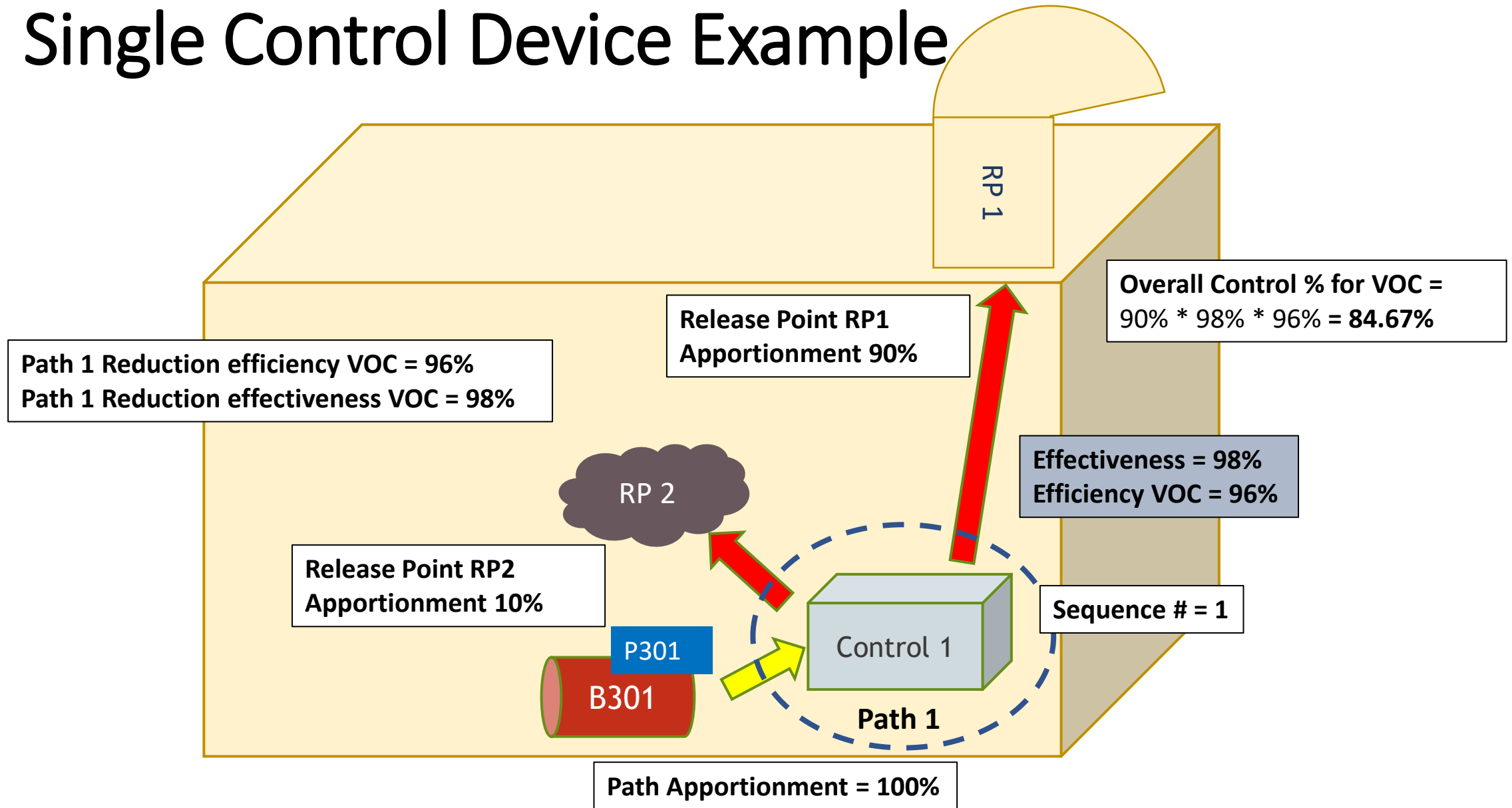
Example of Paths for a Facility with Many Configurations



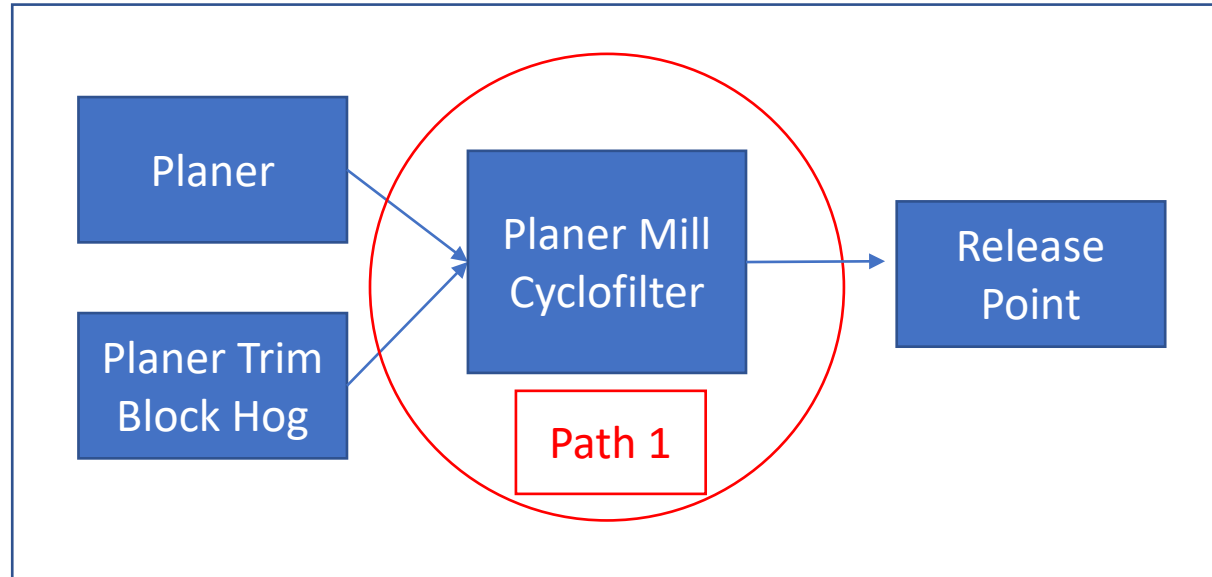
No Control Device Example



Single Control Device Example



Example of Two Processes Sharing a Path



In this example we have two processes sending emissions into the Planer Mill Cyclofilter. Path 1 can be the primary path for the single control and can be used for both processes. Path 1 goes from the processes to the release point.

Paths

Path ID	Sequence Number	Control or Child Path Assignment	Assigned Control or Child Path Apportionment
Path 1	1	Planer Mill Cyclofilter	100%

Release Points

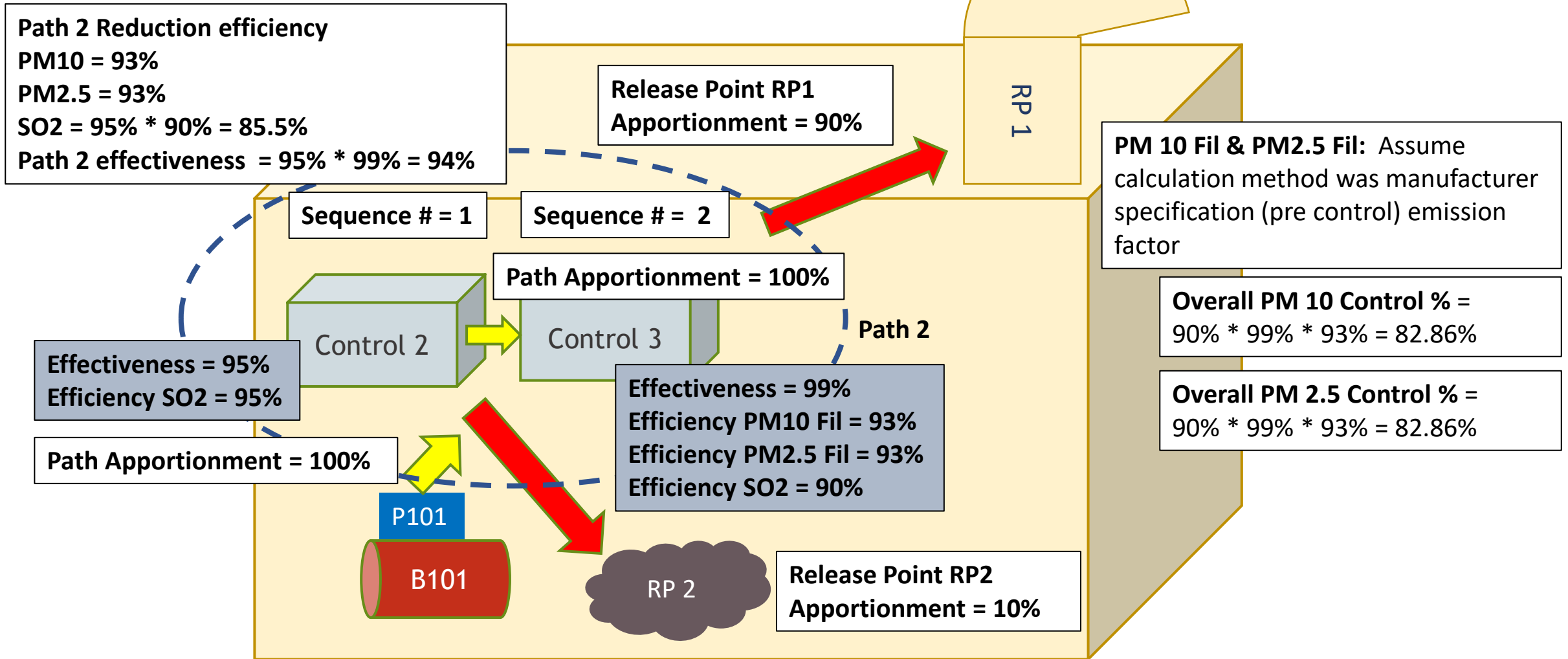
Unit ID	Process ID	Path ID	Release Point ID	Release Point Apportionment
Planer	Process 1	Path 1	Stack 1	100%
Planer Trim Block Hog	Process 2	Path 1	Stack 1	100%

Pause for Single Control Device Q&A

If you only have one control device or single control device configurations in your facility, this concludes your training. You are welcome to stay, and you may also refer to the remaining slides for further details.

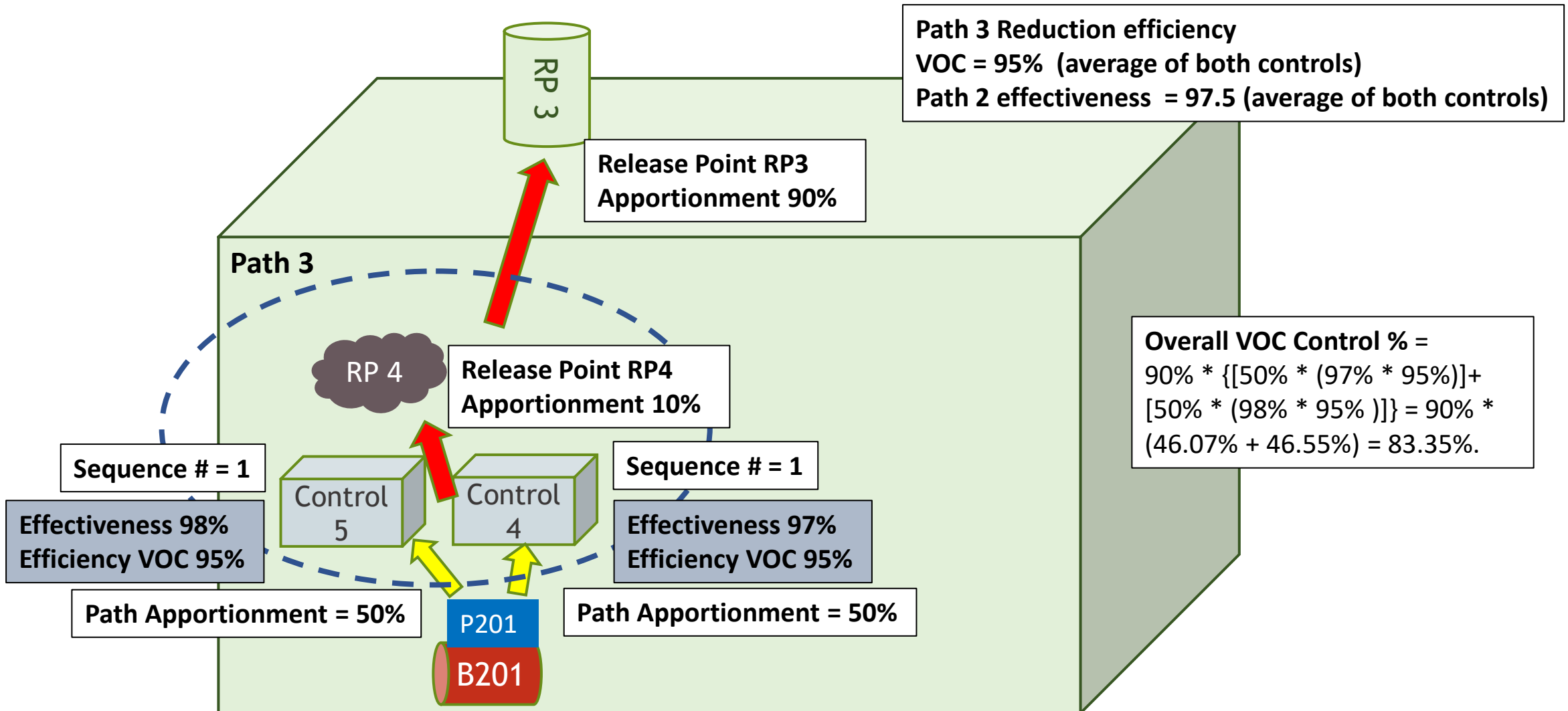
The rest of the training is for reporters whose facilities have multiple controls.

Example Controls in Series



SO2: Assume calculation method was pre-control plus control efficiency, then must *assuming presence of both controls*. For a different calculation method: Overall **SO2** Control % = $90 * [(95\% * 95\%) * (99\% * 90\%)] = 72.37\%$.

Example Controls in Parallel



Additional Considerations about Overall Pollutant Control %

When calculating emissions, if you have more than one control for the *same* pollutant, then your overall control % may be:

- **In series for same pollutant:** capture % [(control 1 effectiveness % * control 1 efficiency %)*(control 2 effectiveness % * control 2 efficiency %)*...]
- **In parallel for same pollutant:** (overall controlled emissions 1 + overall controlled emissions 2+...)
- **Really complex controls configuration for same pollutant,** estimate (discuss with your SLT):
 - For example, (controlled emissions in series + controlled emissions in parallel)/uncontrolled emissions,
 - For example, average, weighted average, depending on the control device configuration
- You'll have to factor in the control apportionment as well when estimating overall control %. See example from previous slide 78.
- If using an emission factor:
 - CAERS will calculate your post-control emissions if you enter Overall Control %. If you plan to do that, only use a pre-control emission factor if using a factor for your calculations.
 - If you enter a post-control emission factor CAERS will not allow the use of overall % control.
- If you do not enter an emission factor, and you enter total emissions and an overall control %, CAERS will assume the total emissions you have entered are post control and will not use the overall control % value you entered.

Control Device Tab for this Example

4 You must enter all controls before assigning them to paths.
 5 Cells with headers highlighted in gray are for data fields that should not be changed if they existed in a previous submission.
 6 Controls that existed in your submission for a previous year should not be deleted, but instead, the user should change their operating status to "Permanently Shutdown".
 7
 8 Tab: Control Devices

Instruction:	Identifier for the control, given by the facility.	Description of the control equipment.	Estimated percent of the reporting period's activity for which the overall control system or approach (including both capture and control measures) were operating as designed (regardless of whether the control measure is due to rule or voluntary).	Drop down. Code that identifies the operating status of the control measure.	Year the current operating status came into effect.	Drop down. Control measure code.	The number operates.
Field	Control ID*	Control Description	Percent Control Effectiveness	Operating Status*	Operating Status Year	Control Measure*	Control Num
Example Entry	CNTL1	Acetaldehyde and Benzene Control	50	Operating	1985	Wet Scrubber - High Efficiency	
Example Entry	CNTL2	Acetaldehyde Control	75	Operating	1985	Wet Scrubber - Medium Efficiency	
Example Entry	CNTL3	NOX Capture Device	75	Operating	1985	Gas Scrubber (General, Not Classified)	
	1	Single control in path.		98 Operating	2018	Catalytic Afterburner	
	2	Control in a series.		95 Operating	2017	Dry Sorbent Injection (DSI, other than ACI)	
	3	Control in a series.		99 Operating	2018	Wet Scrubber	
	4	A control in parallel.		97 Operating	2017	Biofilter	
	5	A control in parallel.		98 Operating	2018	Biofilter	

Ready Accessibility: Investigate Average: 396.5 Count: 12 Sum: 2379 Display Settings 100%

Control Paths Tab for this Example

1

2 Enter all information marked *. Where a drop-down menu exists, select from the list of options in each menu.

3 All field formats are "General" except where specified.

4 Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters.

5 Note there are hidden columns in this worksheet. Please do not alter hidden columns, as these are important for data validations.

6 You should enter all control path information before assigning them to other paths or associating them with processes and release points.

7

8 **Tab: Control Paths**

Instruction:	Identifier of the control path, given by the facility.	Description of the control path.	Estimated percent of the reporting period's activity for which the overall control system or approach (including both capture and control measures) were operating as designed (regardless of whether the control measure is due to rule or voluntary).
Field	Path ID*	Path Description	Percent Path Effectiveness
Example Entry	Primary	Primary Control Flow	50
Example Entry	Secondary	Secondary Control Flow	75
	1	Path 1: B301 > P301 > Control 1 > RP 1 & RP2	98
	2	Path 2: B101 > P101 > Control 2 > Control 3 > RP1 & RP2	94
	3	Path 3: B201 > P 201 > Control 4 & Control 5 > RP3 & RP4	97.5

Ready Accessibility: Investigate Display Settings 100%

Control Assignments for this Example

1

2 ed *. Where a drop-down menu exists, select from the list of options in each menu. All field formats are "General" except where specified.

3 into cells is in the correct format and is devoid of spaces, quotation marks and other characters. Note there are hidden columns in this worksheet.

4 n columns, as these are important for data validations.

5 control paths before assigning them. To each control path in column D, assign either a control or a path, but not both in the same row.

8

9	Drop down. Select the name (ID) of the control path.	Drop down. Control assigned to the path in D.	Drop down. Child path assigned to the path in D.	The number in the sequence the control or path occupies within a path.	The percentage of emissions from the previous control or path in the sequence, that is directed to this control or path.
10	Path ID*	Control ID	Control Path (Child)	Sequence Number*	% Path Apportionment (of Control or Sub-Path)*
14	Primary	NOX Control		1	75
15	Primary		Secondary	1	25
16	Secondary	Control 001		1	100
17	Secondary	Control 002		2	100
24	1	1		1	100.0
25	2	2		1	100.0
26	2	3		2	100.0
27	3	4		1	50.0
28	3	5		1	50.0
29					
30					
31					
32					
33					
34					
35					

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Control Device Pollutants for this Example

Tab: Control Device Pollutants			
Instruction:	Drop down. Control ID for the equipment that is controlling the pollutant.	Drop down. Pollutant the equipment controls.	Efficiency with which the control removes the pollutant.
Field	Control ID*	Pollutant Name*	Percent Reduction Efficiency*
Example Entry	Control 001	Acetaldehyde	99.9
Example Entry	Control 002	Benzene	99.9
Example Entry	Control 001	Acetaldehyde	5.3
Example Entry	NOX Control	Nitrogen Oxides	5.3
	1	Volatile Organic Compounds	96
	2	Sulfur Dioxide	95
	3	PM10 Filterable	93
	3	PM2.5 Filterable	93
	3	Sulfur Dioxide	90
	4	Volatile Organic Compounds	95
	5	Volatile Organic Compounds	95

Control Path Pollutants for this Example

	A	D	F	G
7				
8	Tab: Control Path Pollutants			
9	Instruction:	Drop down. Control Path ID for path the equipment that is controlling the pollutant is assigned.	Drop down. Pollutant the equipment controls.	Efficiency with which the control removes the pollutant.
10	Field	Path ID*	Pollutant Name*	Percent Reduction Efficiency*
14	Example Entry	Primary	Acetaldehyde	99.9
15	Example Entry	Primary	Benzene	99.9
16	Example Entry	Secondary	Acetaldehyde	5.3
17	Example Entry	Secondary	Nitrogen Oxides	5.3
24		1	Volatile Organic Compounds	96
25		2	Sulfur Dioxide	85.5
26		2	PM2.5 Filterable	93
27		2	PM10 Filterable	93
28		3	Volatile Organic Compounds	95
29				
30				

Control Devices | Control Paths | Control Assignments | Control Device Pollutants | **Control Path Pollutants** | Apportionment | Reporting ...

Ready Accessibility: Investigate Display Settings 100%

Release Point Apportionment for this Example

1

3 Enter all information marked *. Where a drop-down menu exists, select from the list of options in each menu. All field formats are "General" except where specified.

4 Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters.

5 Enter all release points before apportioning emissions to them.

8 **Tab: Apportionment**

Instruction:	Drop down. Identifier of the release point that the process emissions are being apportioned to.	Drop down. The process from which emissions are being apportioned to the release point.	Drop down. The path through which emissions flow from the process to the release point.	The percent of process emissions that are ultimately routed to the release point.
Field	Release Point ID*	Process ID*	Control Path ID	% Release Point Apportionment*
Example Entry	Smokestack 1	Drying Process	Primary	33
Example Entry	Smokestack 2	Drying Process	Primary	33
Example Entry	Vent 1	Drying Process	Primary	34
Example Entry	Smokestack 1	Disposal Process		60
Example Entry	Smokestack 2	Disposal Process		40
Example Entry	Vent 1	Storage Process		10
Example Entry	Smokestack 1	Storage Process		20
Example Entry	Smokestack 2	Storage Process		70
	RP1	01-P301	1	90
	RP1	B101-P101	2	90
	RP2	B301-P301	1	10
	RP2	B101-P101	2	10
	RP3	B201-P201	3	90
	RP3	B102-P102		95
	RP4	B102-P102		5
	RP4	B201-P201	3	10

Ready Accessibility: Investigate

Control Device Pollutants Control Path Pollutants **Apportionment** Reporting Period Operating Details Emissions Emission Form ...

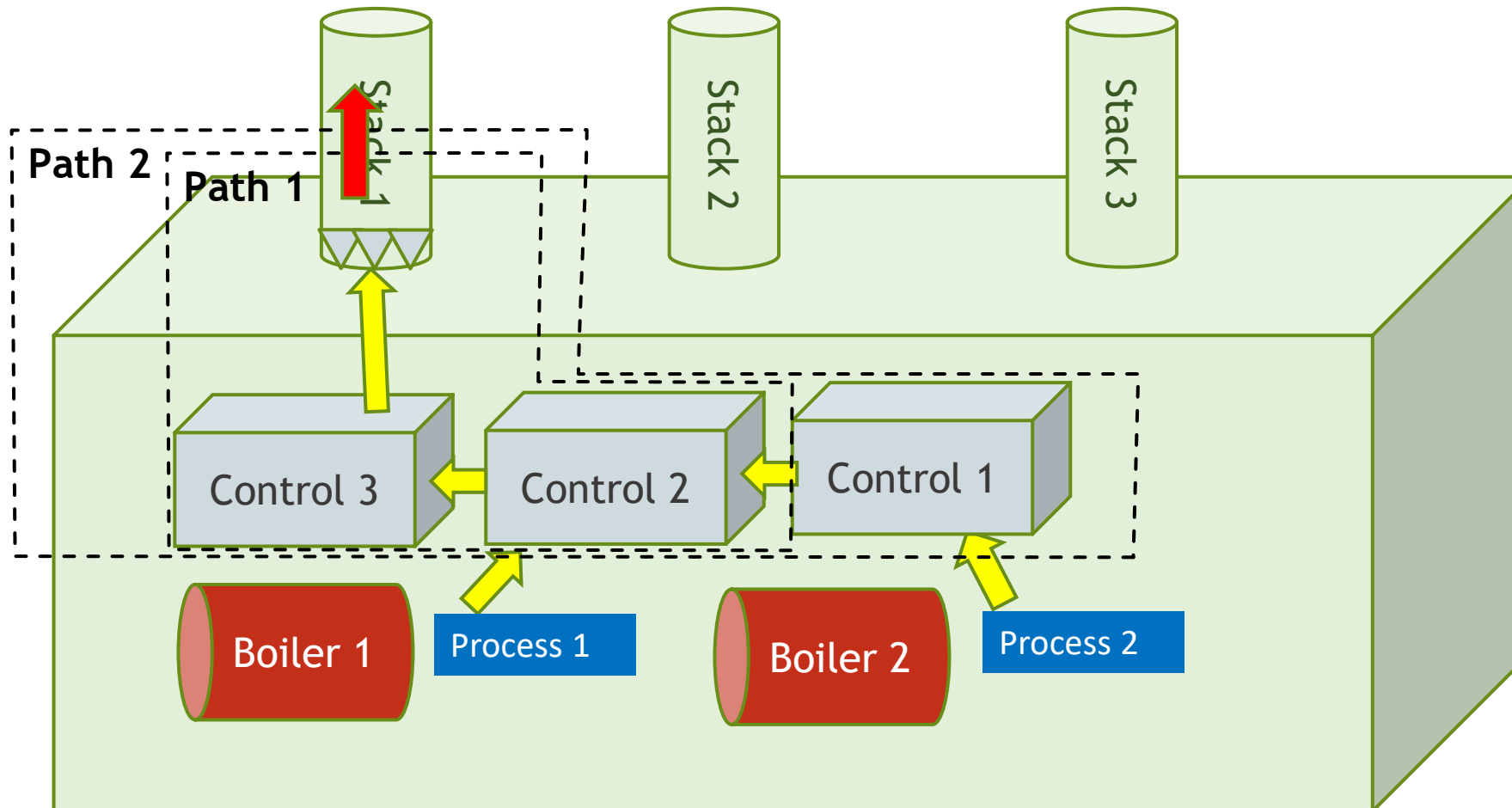
Display Settings 100%

Emissions for this Example

Tab: Emissions								
Instruction:	Drop down. The unit, process, and reporting period reference.	Drop down. Pollutant from the process in the reporting year.	Drop down. Select "true" if no emission factor exists, or the units of measure of the denominator of the available emission factor do not match your throughput units of measure.	Total emisison for the pollutant.	Drop down. Units of measure of the emissions.	The overall percent of the pollutant that is removed by the controls in the path from the process to the release point.	Emission factor for the calculation.	Description of the emission factor.
Field	Reporting Period*	Pollutant Name*	I prefer to calculate this emission myself	Total Emissions*	Emissions Unit of Measure*	Overall Control %	Emissions Factor	Emissions Factor Description
Example Entry	ML05-1-Annual	Acetaldehyde	false	1000	TON			6.200E-2 Lb per 1000 Sc
Example Entry	SCR-1-Annual	Benzene	false	1007.75	TON		0.592	5.900E-2 Lb per 1000 Sc
Example Entry	SCR-2-Annual	Nitrogen Oxides	true	2015.6	TON		0.6	
	B101-P101-Annual	Nitrogen Oxides	false	195.0	LB			3 This factor was present
	B101-P101-Annual	PM10 Filterable	false	22.282	LB	82.86		2 Acme Corporation User
	B101-P101-Annual	PM2.5 Filterable	false	11.141	LB	82.86		1 Acme Corporation User
	B101-P101-Annual	Sulfur Dioxide	false	195.0	LB			3 Approved by SLT on Ma
	B101-P101-Annual	Volatile Organic Compounds	false	390.0	LB			6 CEMS Ratio
	B102-P102-Annual	PM10 Filterable	false	6630.0	LB			EPA. October, 1996. Se
	B102-P102-Annual	PM2.5 Filterable	false	3744.0	LB			PM Calculator. EPA. Ja
	B201-P201-Annual	PM2.5 Primary (Filt + Cond)	false	200000.0	LB			5 SLT approved on 3/21/2
	B201-P201-Annual	Sulfur Dioxide	false	4000.0	LB			
	B201-P201-Annual	Volatile Organic Compounds	false	120000.0	LB			3 Tested on 03/2017.
	B301-P301-Annual	Volatile Organic Compounds	false	54.945	LB		83.35	3 Information your SLT w

Examples of More Complex Control Device Configurations

In Series



Control devices 1, 2, 3, and 4 are set up in sequence. Boiler and Process 2 send emissions to control 1. Boiler and process 1 send emissions to control 2. Path 1 is the primary path between Boiler and Process 1 to Stack 1. Path 2 is the primary path between boiler and process 2 and stack 1. Path 1 is a “child” path of Path 2. Path 2 is a “primary” path.

Numerical Example of Controls in Series and their Paths

Controls

Control ID	% Effectiveness	Pollutant	% Efficiency	Overall % Reduction
Control 1	95%	VOC	80%	76%
Control 1	-	CO	95%	90%
Control 2	90%	PM10-PRI	90%	81%
Control 2	-	PM-CON	100%	90%
Control 3	90%	NOX	90%	81%
Control 4	90%	SO2	90%	81%

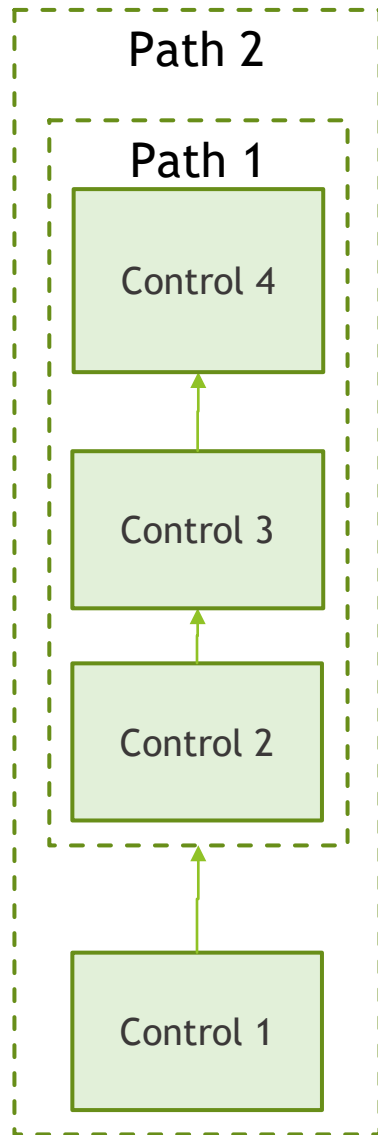
Paths

Path ID	Sequence Number	Assignment (Control or Path)	Apportionment (Control or Path)
Path 1	1	Control 2	100%
Path 1	2	Control 3	100%
Path 1	3	Control 4	100%
Path 2	1	Control 1	100%
Path 2	2	Path 1	100%

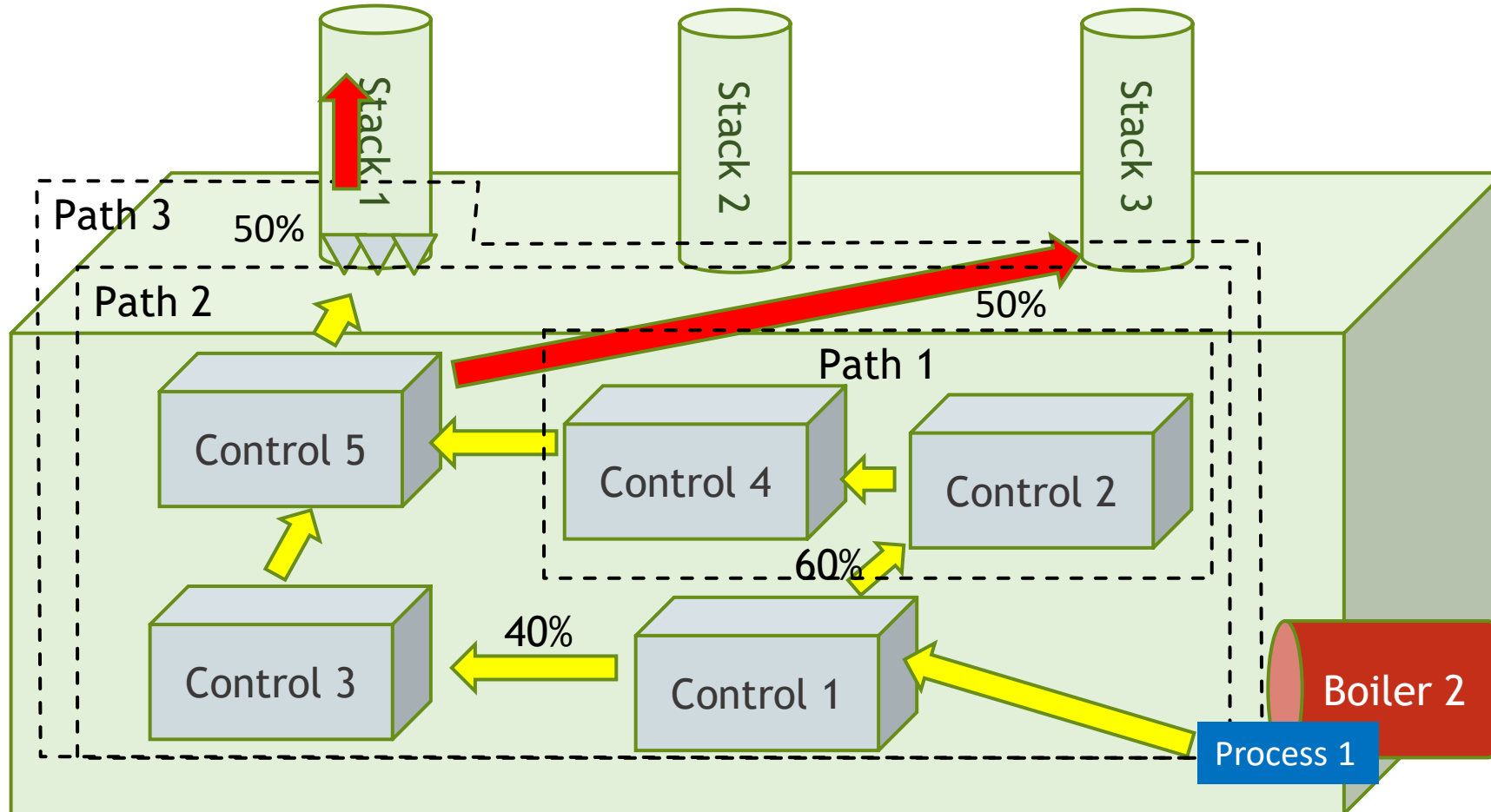
In this example we assume 100% of emissions are routed to the release point (% capture = 100%, no fugitives).

Release Points

Unit ID	Process ID	Path ID	Release Point ID	Release Point Apportionment
Boiler 1	Process 1	Path 1	Stack 1	100%
Boiler 2	Process 2	Path 2	Stack 1	100%

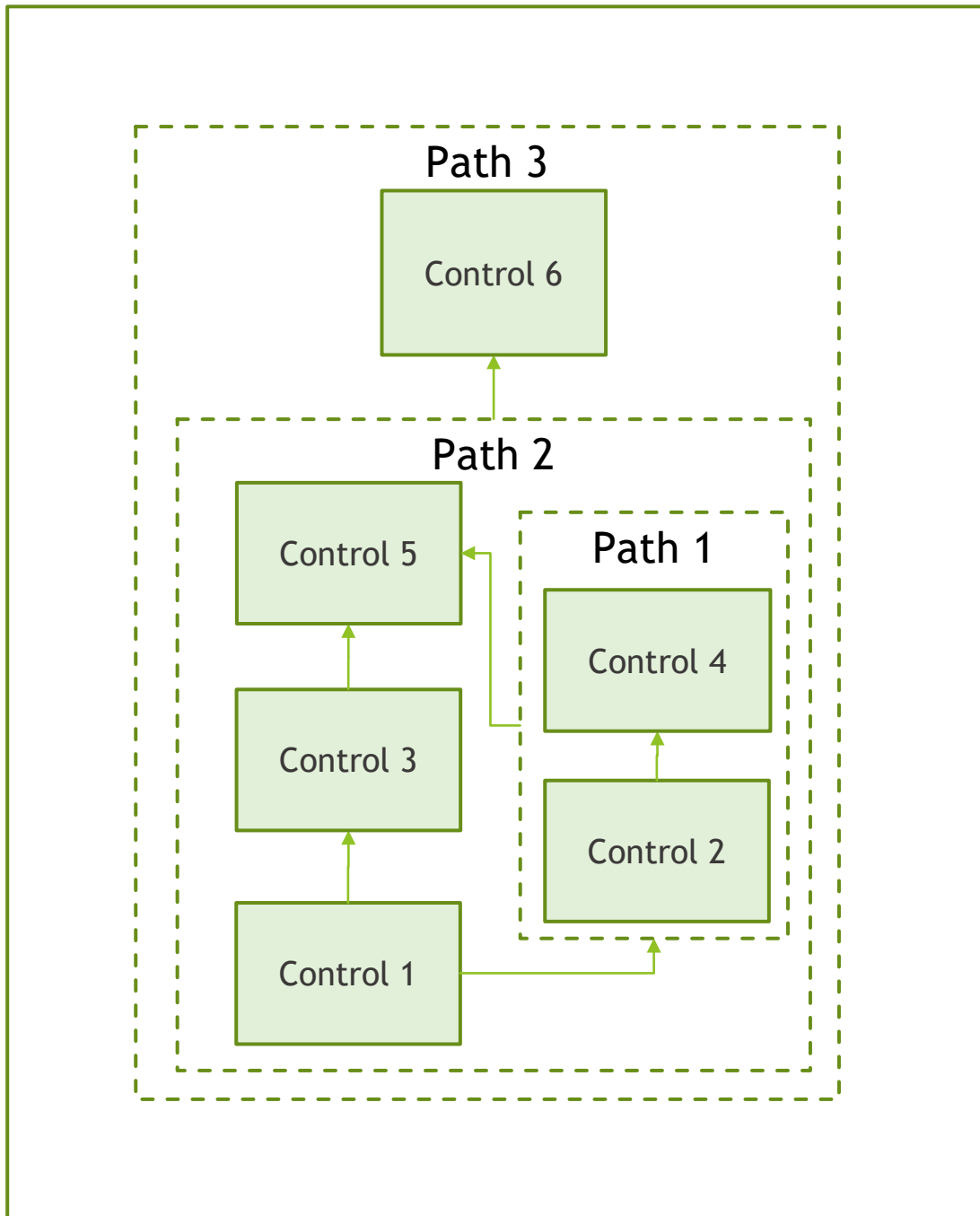


In Parallel



Path 1 is a child path of Path 2. Path 2 is a “primary path” between the process and Stack 3. Path 2 is a child path of Path 3. Path 3 is a “primary path” between the process and Stack 1.

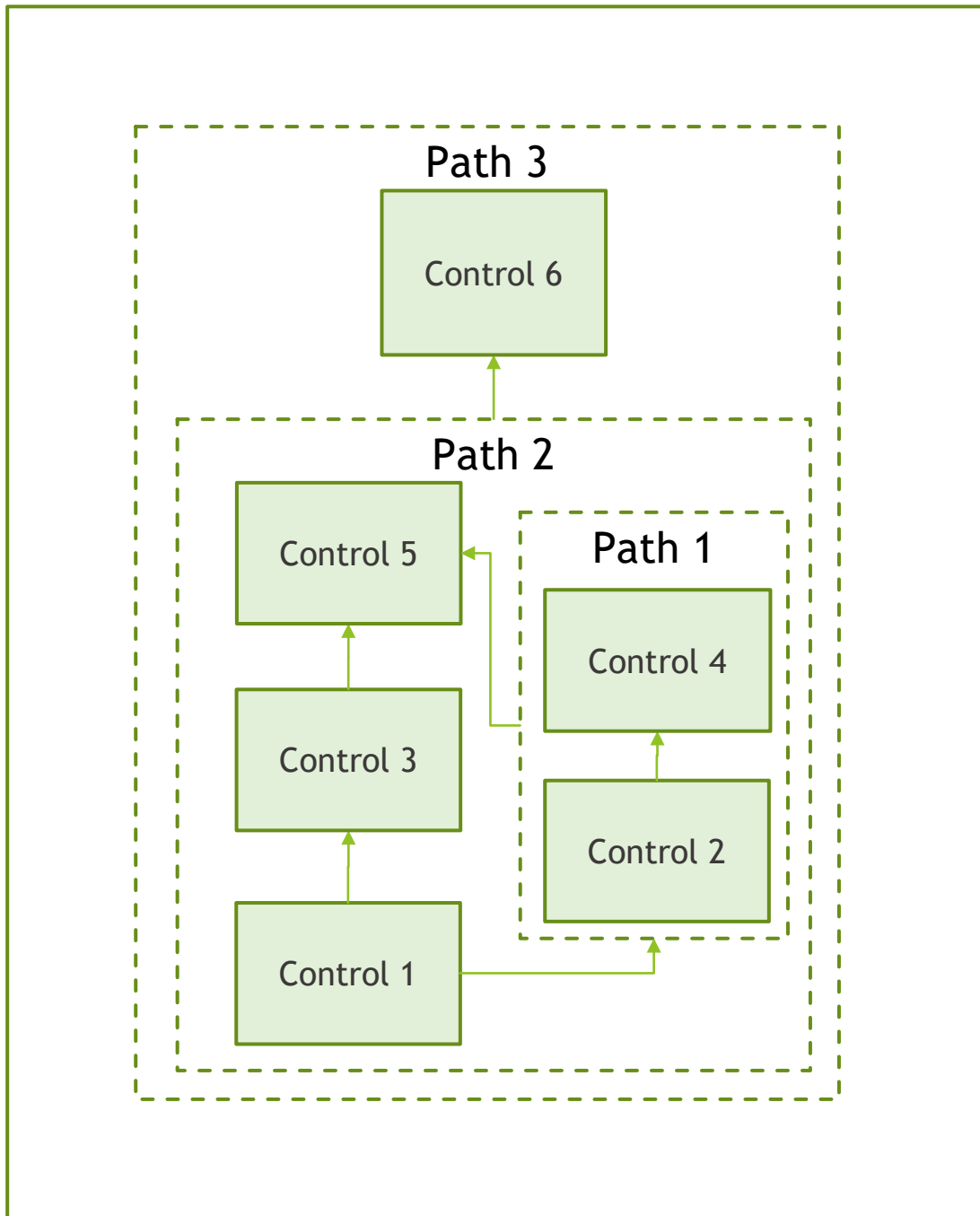
Numerical Example of Controls in Parallel and Series



Controls

Control ID	% Effectiveness	Pollutant	% Efficiency	Overall % Reduction
Control 1	95%	VOC	80%	68%
Control 2	90%	PM10-PRI	90%	81%
Control 2	-	PM-CON	100%	90%
Control 3	90%	CO	95%	86%
Control 4	95%	NOX	99%	75%
Control 5	90%	Pb	95%	81%
Control 6	98%	SO2	97%	95%

Controls in Parallel and Series Paths and Release Points



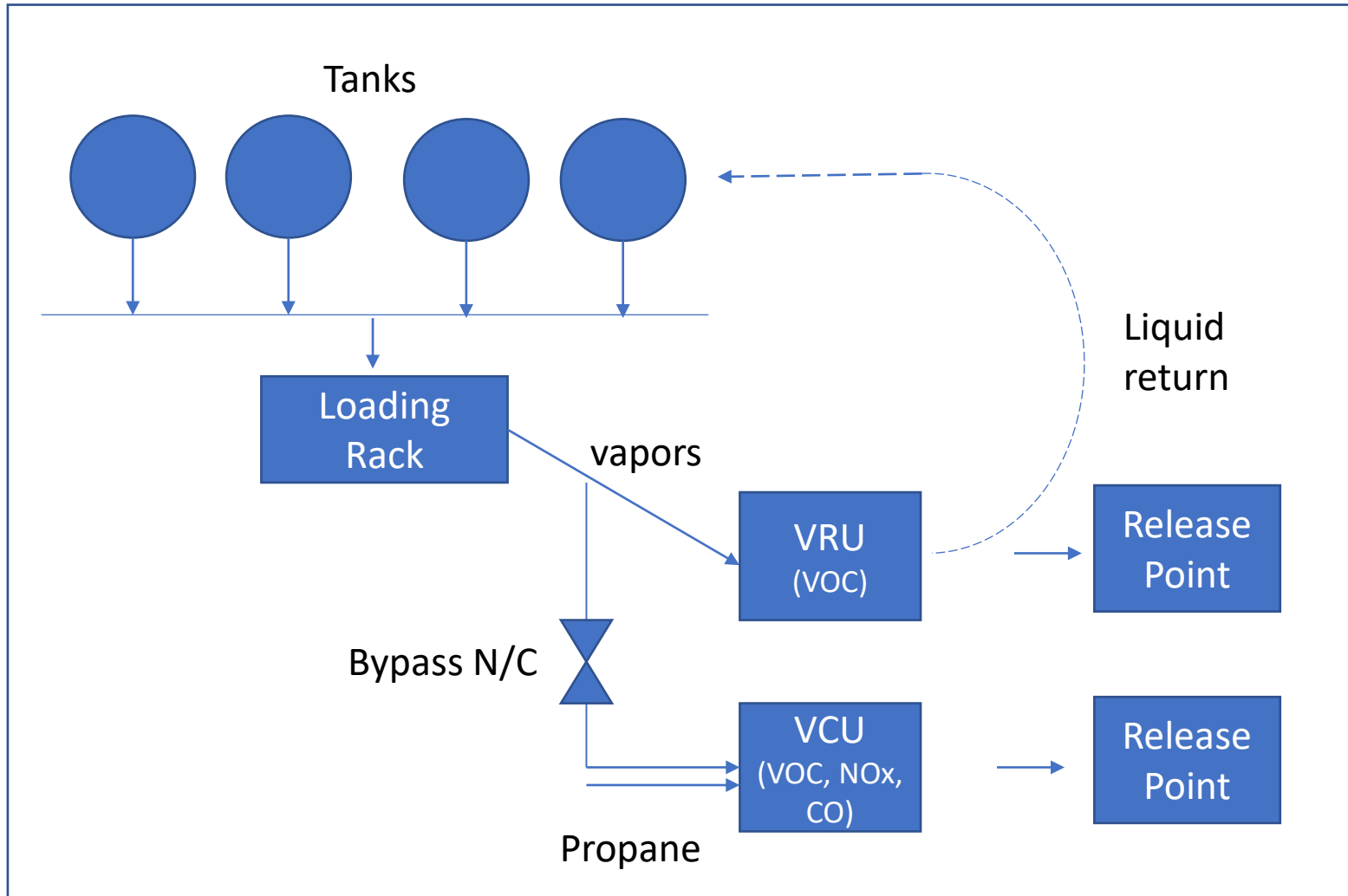
Paths

Path ID	Sequence Number	Assignment (Control or Path)	Apportionment (Control or Path)
Path 1	1	Control 2	100%
Path 1	2	Control 4	100%
Path 2	1	Control 1	100%
Path 2	2	Control 3	40%
Path 2	2	Path 1	60%
Path 2	3	Control 5	100%
Path 3	1	Path 2	100%
Path 3	2	Control 6	100%

Release Points

Unit ID	Process ID	Path ID	Release Point ID	Release Point Apportionment
Boiler 2	Process 1	Path 2	Stack 3	47%
Boiler 2	Process 1	Path 3	Stack 1	47%
Boiler 2	Process 1	Path 2	Fugitive	3%
Boiler 2	Process 1	Path 3	Fugitive	3%

Example with a Back-Up Process

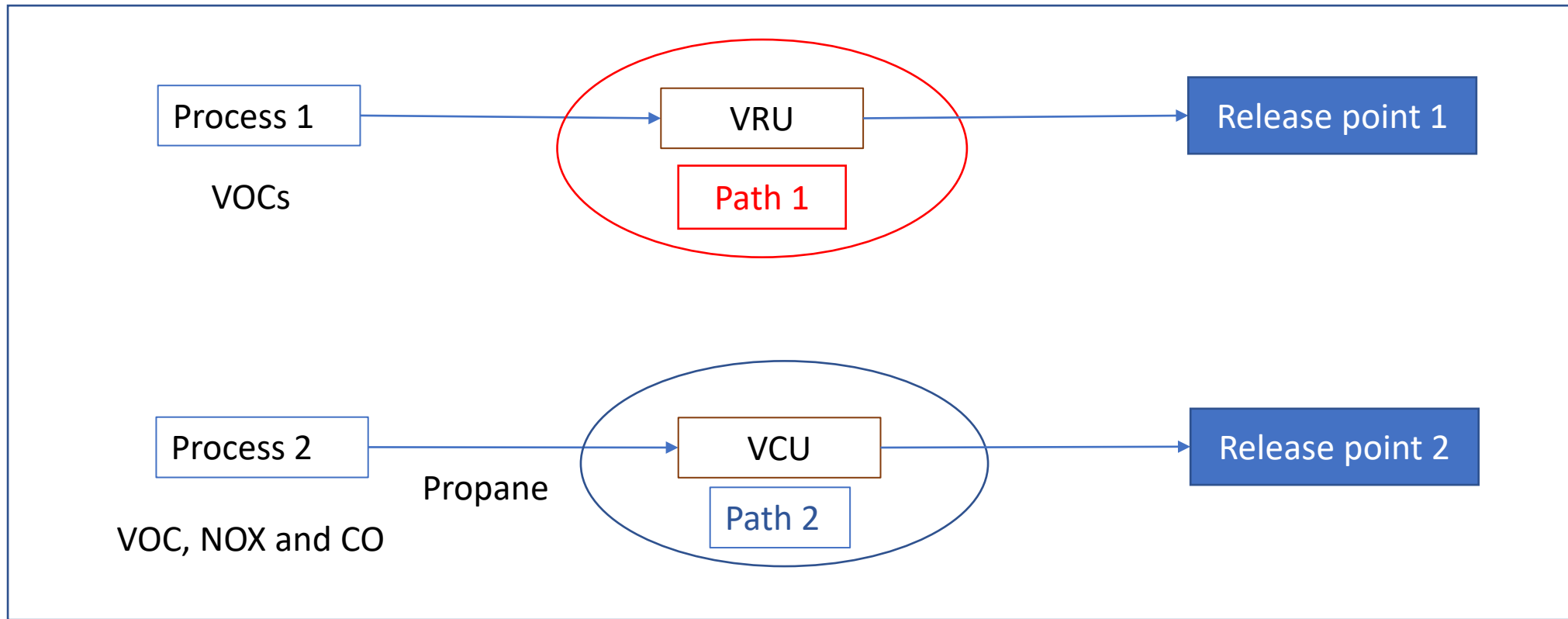


1. The emissions only go to the VCU when the VRU is not working, per permit. The VCU is a backup to the VRU and was only used about 1% of 2019 or about 100 hours.

2. Only one runs at a time, taking 100% of the inlet/emissions.

3. Two different release points. A vent off the VRU, the VCU is a stack/flare.

4. Gasoline vapor is only emissions off the loading rack. So VCU emissions are VOCs. Because we use propane in the VRC it has VOC and NOx/CO.



Process 1 (VOC)

Path 1:
VRU sequence 1

If individual control capture isn't 100% then rel apportionment should be adjusted to reflect % going to fugitives.

Process 2 (VOC, NOX and CO)

Path 2
VCU Sequence 1

Recall VCU is a "backup" for the first process. When the VRU is offline, the VCU is running.

VRU and VCU Path and Release Point Data

Paths

Path ID	Sequence Number	Control or Child Path Assignment	Assigned Control or Child Path Apportionment
Path 1	1	Planer Mill Cyclofilter	100%

Release Points

Unit ID	Process ID	Path ID	Release Point ID	Release Point Apportionment
Planer	Process 1	Path 1	Stack 1	100%
Planer Trim Block Hog	Process 2	Path 1	Stack 1	100%

There are two different processes with different SCCs:

Evaporation recovery unit of gasoline vapors, for VOC and HAP-VOC pollutants.

Propane combustion process including all combustion pollutants, plus whatever VOC wasn't combusted.

How long each control runs (100 hours), etc. would be entered with the process information.

In this case effectiveness would be 100% as you are entering the hours that the VRU and VCU are effective.

How to Get Help

Regardless of what help you need always send your SLT:

1. Facility name and ID
2. Screenshot(s) of error you are getting
3. BU template (if using) that is giving you errors
4. Diagram -even if by hand and scanned in- of the controls set up you have (especially for complex controls)

Steps:

1. If CAERS issue: Help Desk first (Click Help in UI top right of your screen)
2. If questions about calculations: Your SLT (they will elevate to EPA as needed)

Questions