Combined Air Emissions Reporting System (CAERS)

Reporting Control Devices in CAERS

January 30, 2025

Before we begin…

- Keep yourselves muted. Type your questions in the chat box as we go through the training.
- A copy of this ppt and the video will be uploaded to our CAERS website.
- 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.

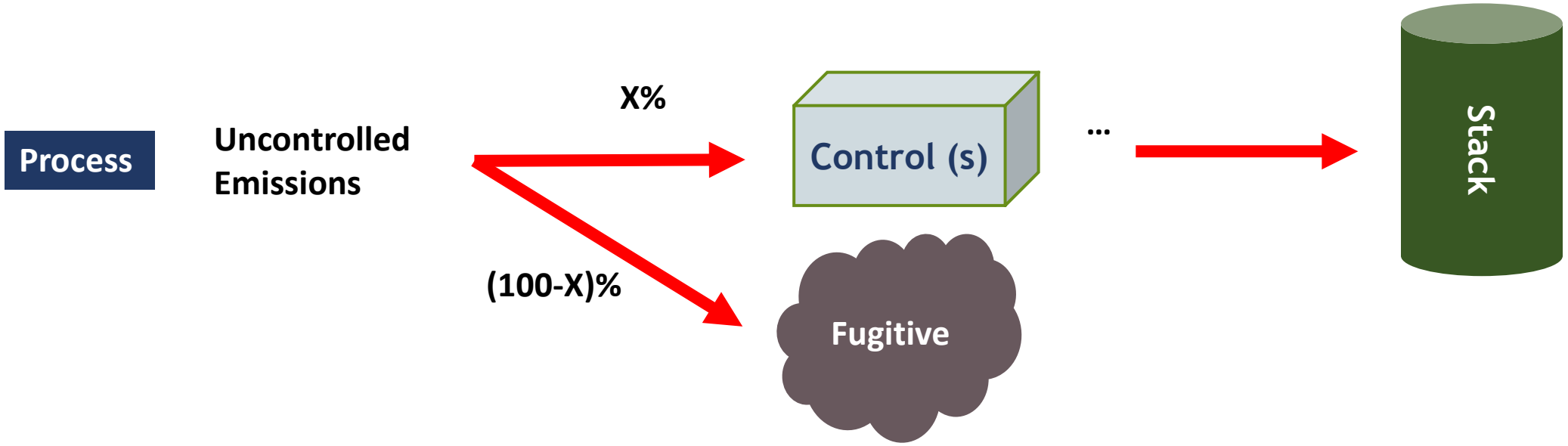
Outline of Training

- Control-related Concepts and Data Fields
- Where and How to enter your data
- Entering Data for Different Control Configurations
  - 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)%

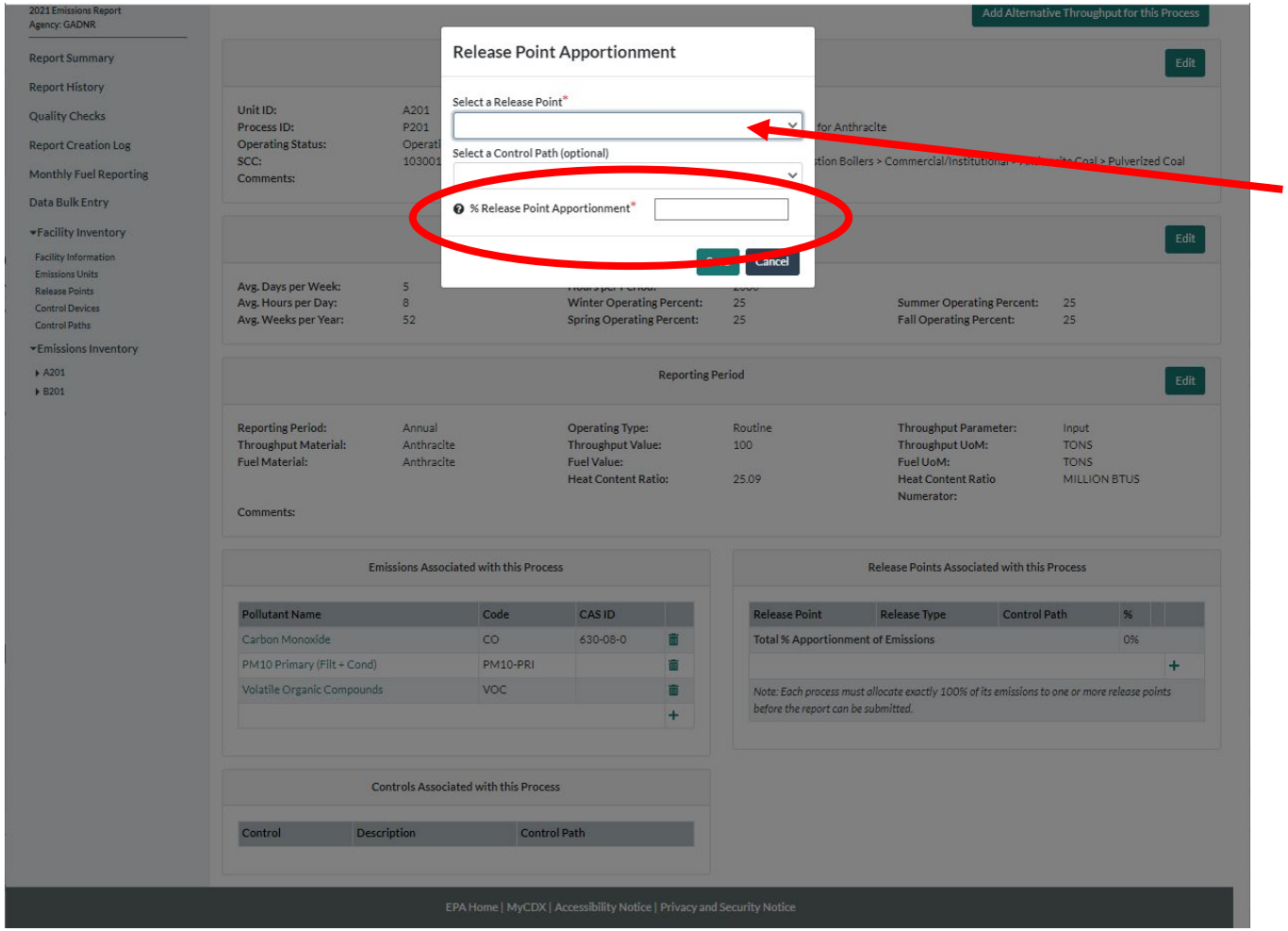


Note that 100% of the original emissions must be assigned to one or more release points

Release Point Apportionment - User Interface

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

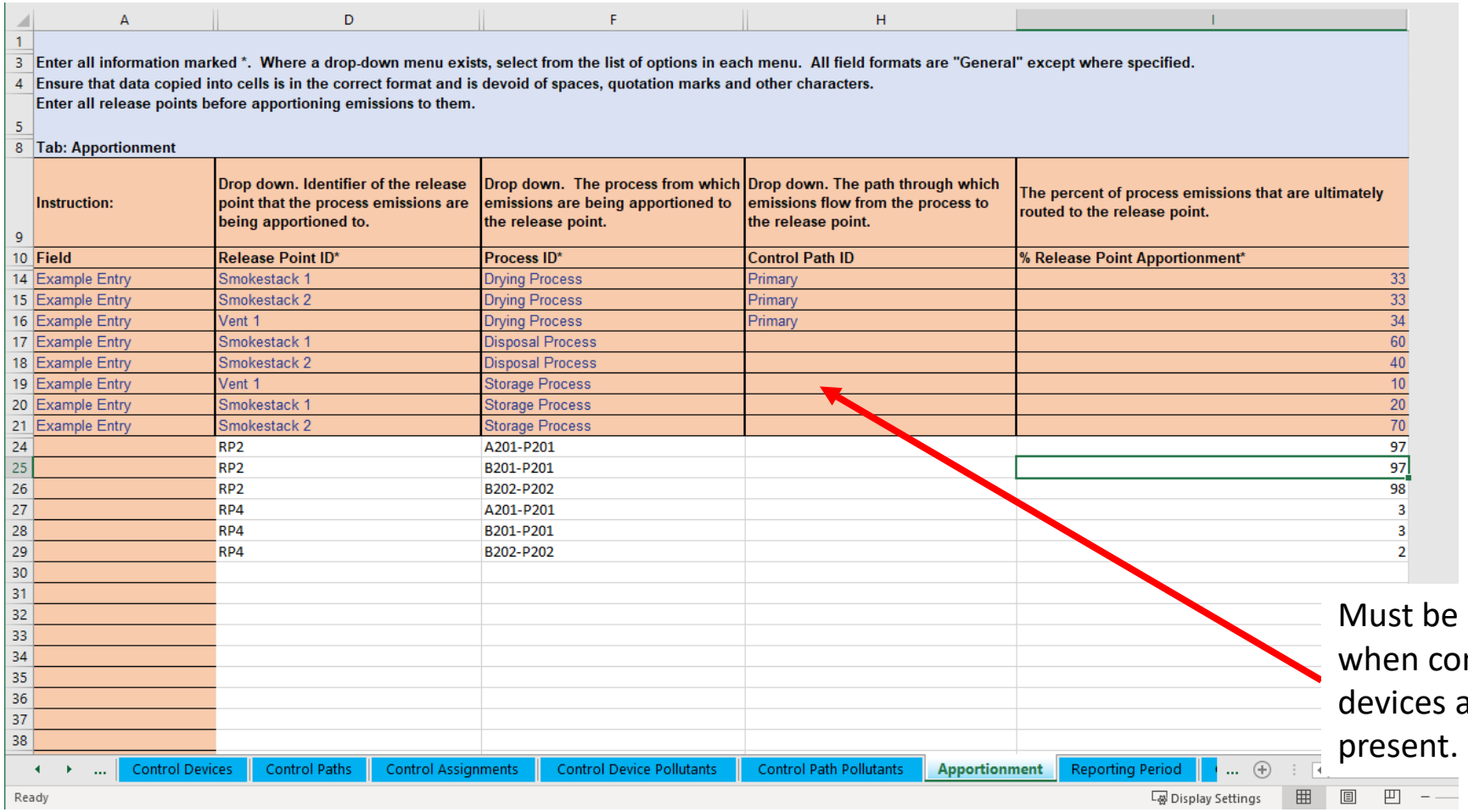
The process and release point(s) must exist in CAERs before emissions can be apportioned.



Must be entered when control devices are present.

Release Point Apportionment - Bulk Upload

Found in the “Apportionment” tab and can be entered for existing release points.



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 release points before apportioning emissions to them.

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
	RP2	A201-P201		97
	RP2	B201-P201		97
	RP2	B202-P202		98
	RP4	A201-P201		3
	RP4	B201-P201		3
	RP4	B202-P202		2

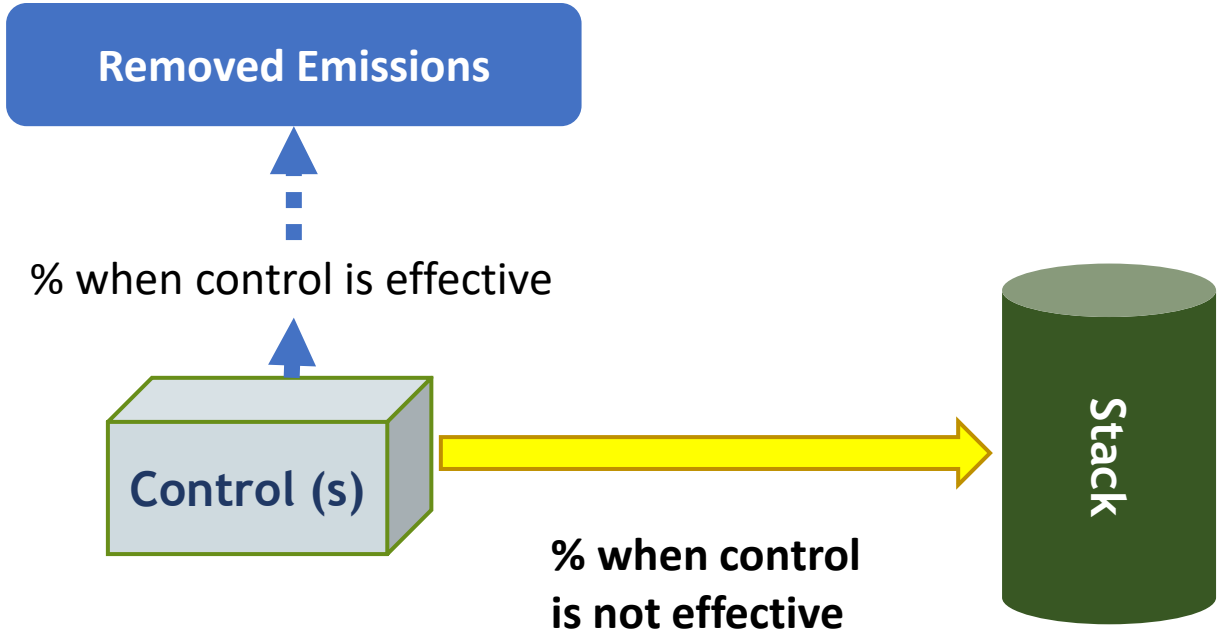
Control Devices | Control Paths | Control Assignments | Control Device Pollutants | Control Path Pollutants | Apportionment | Reporting Period

Ready

Must be entered when control devices are present.

Percent Control Device 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.

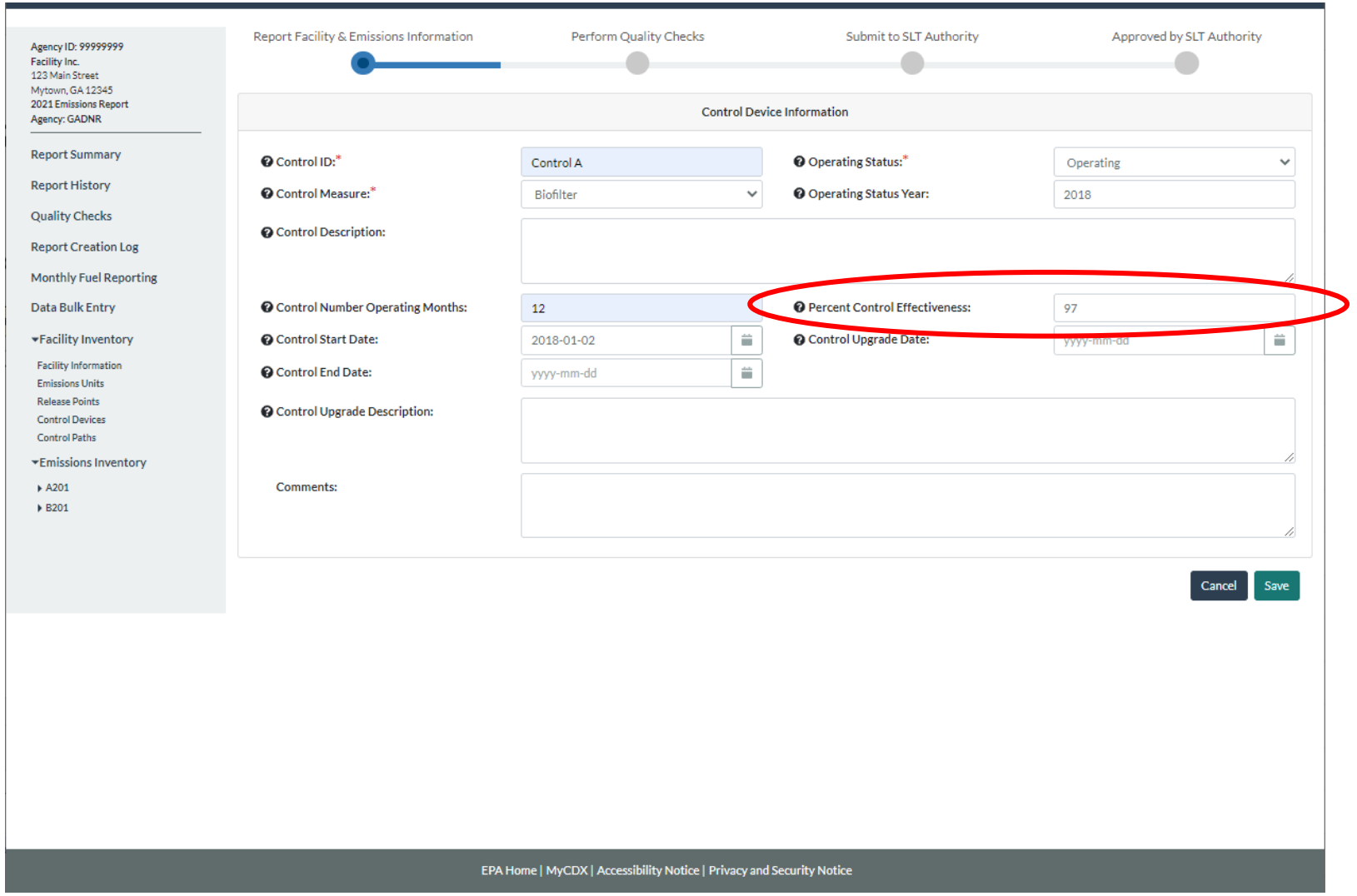


Example:
Control Effectiveness =
(2000-200)/(2000) *100 = 90%, where:

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

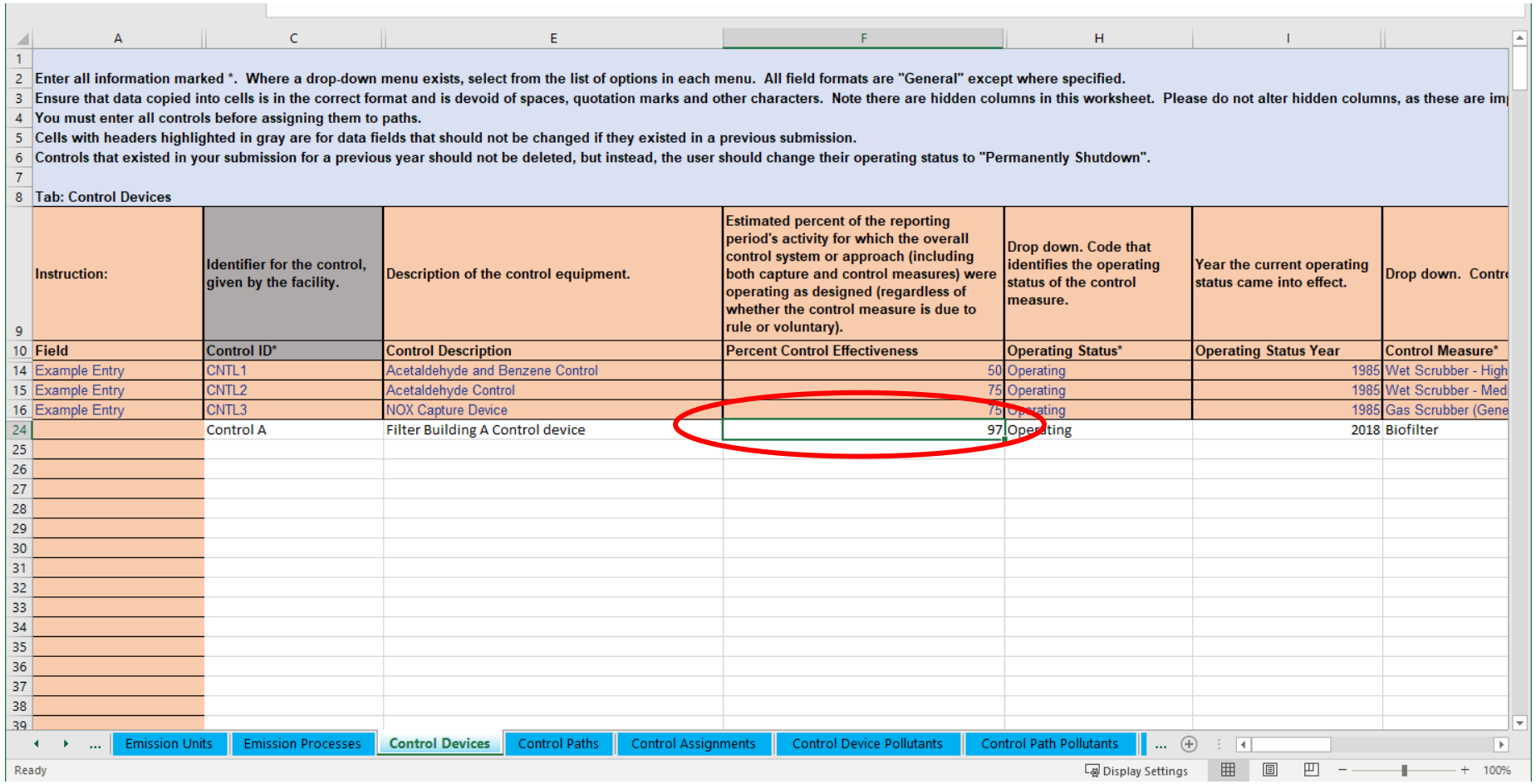
Control Device Effectiveness - User Interface

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



Control Device Effectiveness - Bulk Upload

Found in the "Control Device" tab.



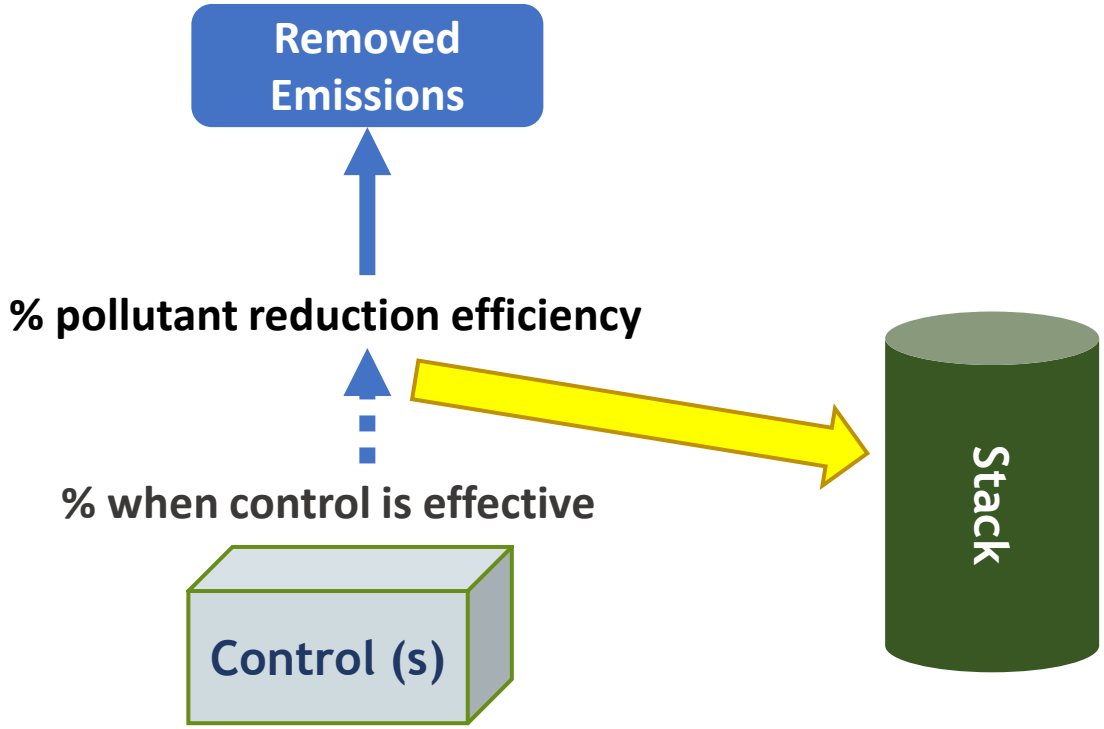
	A	C	E	F	H	I	
1							
2	Enter all information marked *. Where a drop-down menu exists, select from the list of options in each menu. All field formats are "General" except where specified.						
3	Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters. Note there are hidden columns in this worksheet. Please do not alter hidden columns, as these are im						
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						
9	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. Contr
10	Field	Control ID*	Control Description	Percent Control Effectiveness	Operating Status*	Operating Status Year	Control Measure*
14	Example Entry	CNTL1	Acetaldehyde and Benzene Control	50	Operating	1985	Wet Scrubber - High
15	Example Entry	CNTL2	Acetaldehyde Control	75	Operating	1985	Wet Scrubber - Med
16	Example Entry	CNTL3	NOX Capture Device	75	Operating	1985	Gas Scrubber (Gene
24		Control A	Filter Building A Control device	97	Operating	2018	Biofilter
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							

Emission Units | Emission Processes | Control Devices | Control Paths | Control Assignments | Control Device Pollutants | Control Path Pollutants

Ready | Display Settings | 100%

Control Percent Pollutant Reduction Efficiency

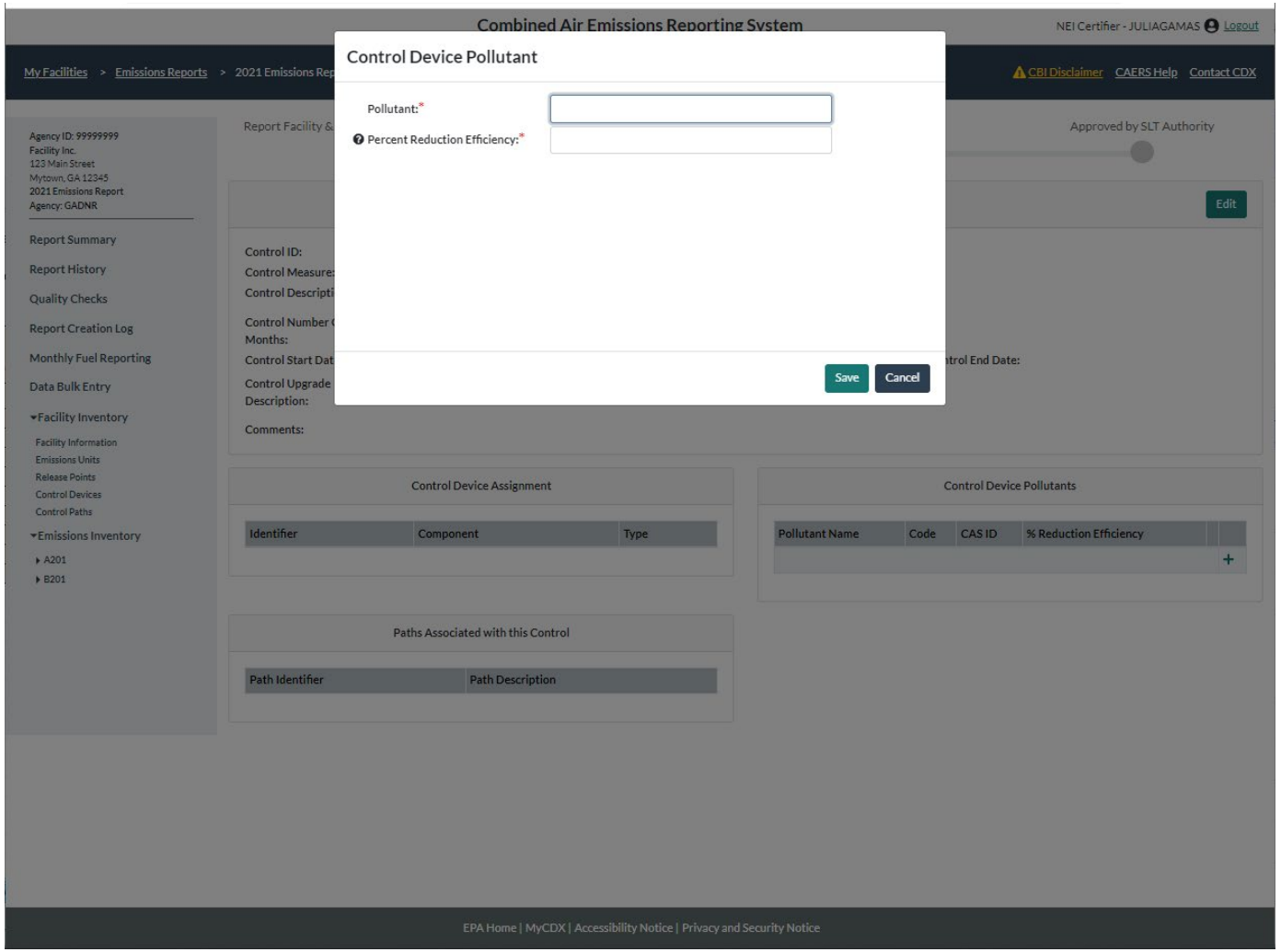
Percent Pollutant Reduction Efficiency: The percent reduction achieved for the pollutant when all control measures are operating as designed. This information could be obtained from the vendor or test data, for example.



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

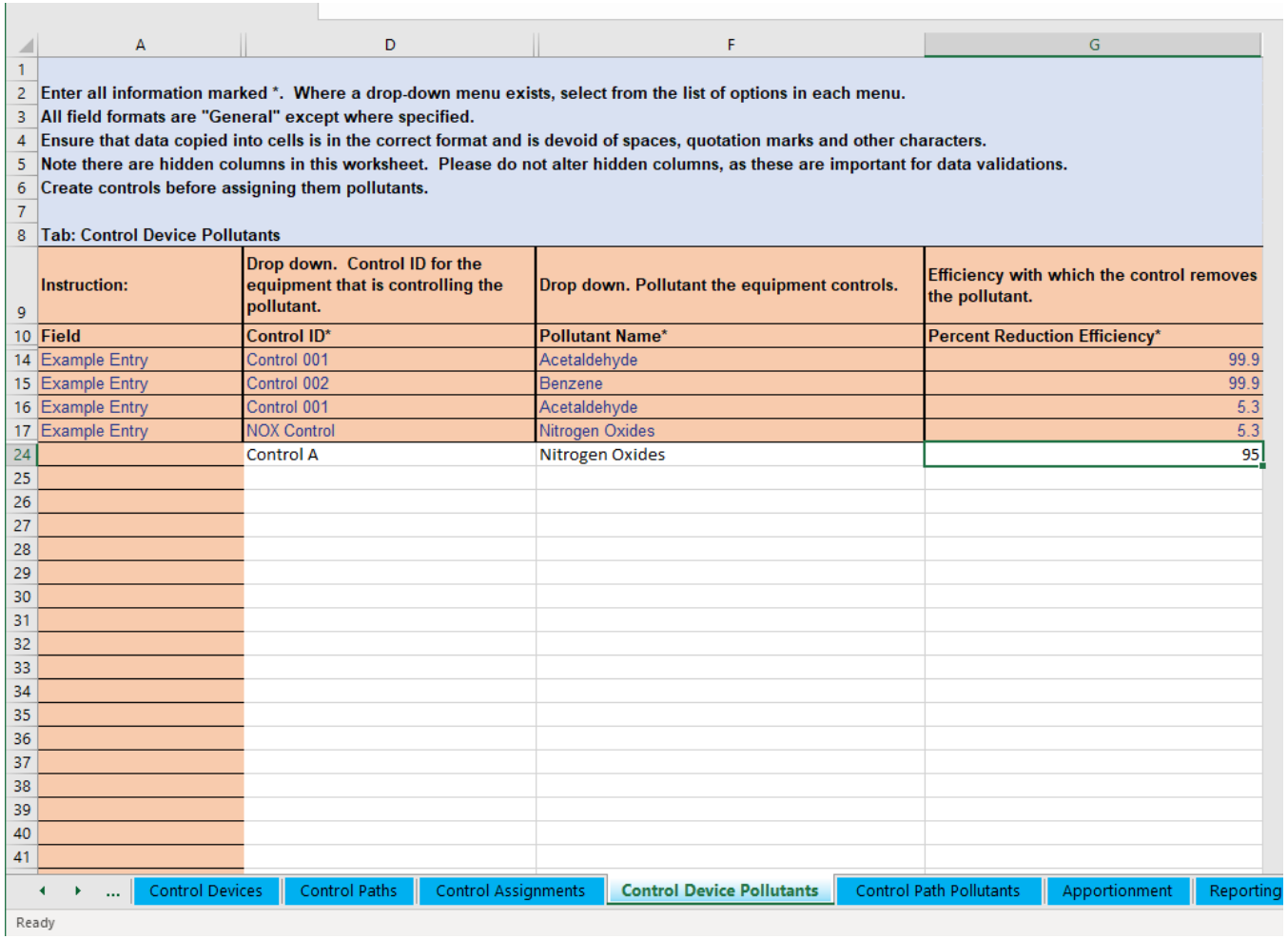
Control Percent Pollutant Reduction Efficiency - User Interface

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



Control Percent Pollutant Reduction Efficiency - Bulk Upload

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

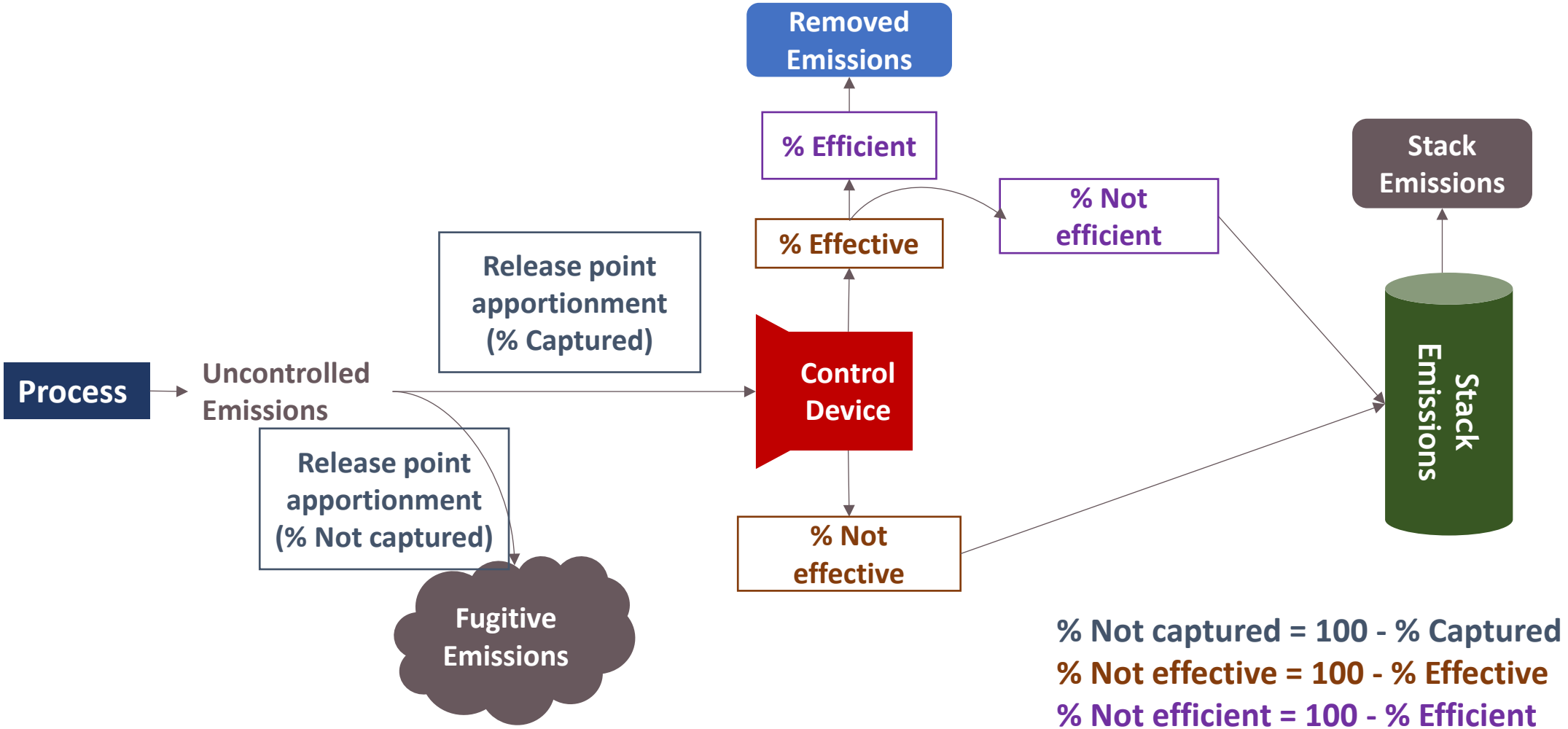


	A	D	F	G
1				
2	Enter all information marked *. Where a drop-down menu exists, select from the list of options in each menu.			
3	All field formats are "General" except where specified.			
4	Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other 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 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				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				

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

Ready

Flow of Uncontrolled Emissions



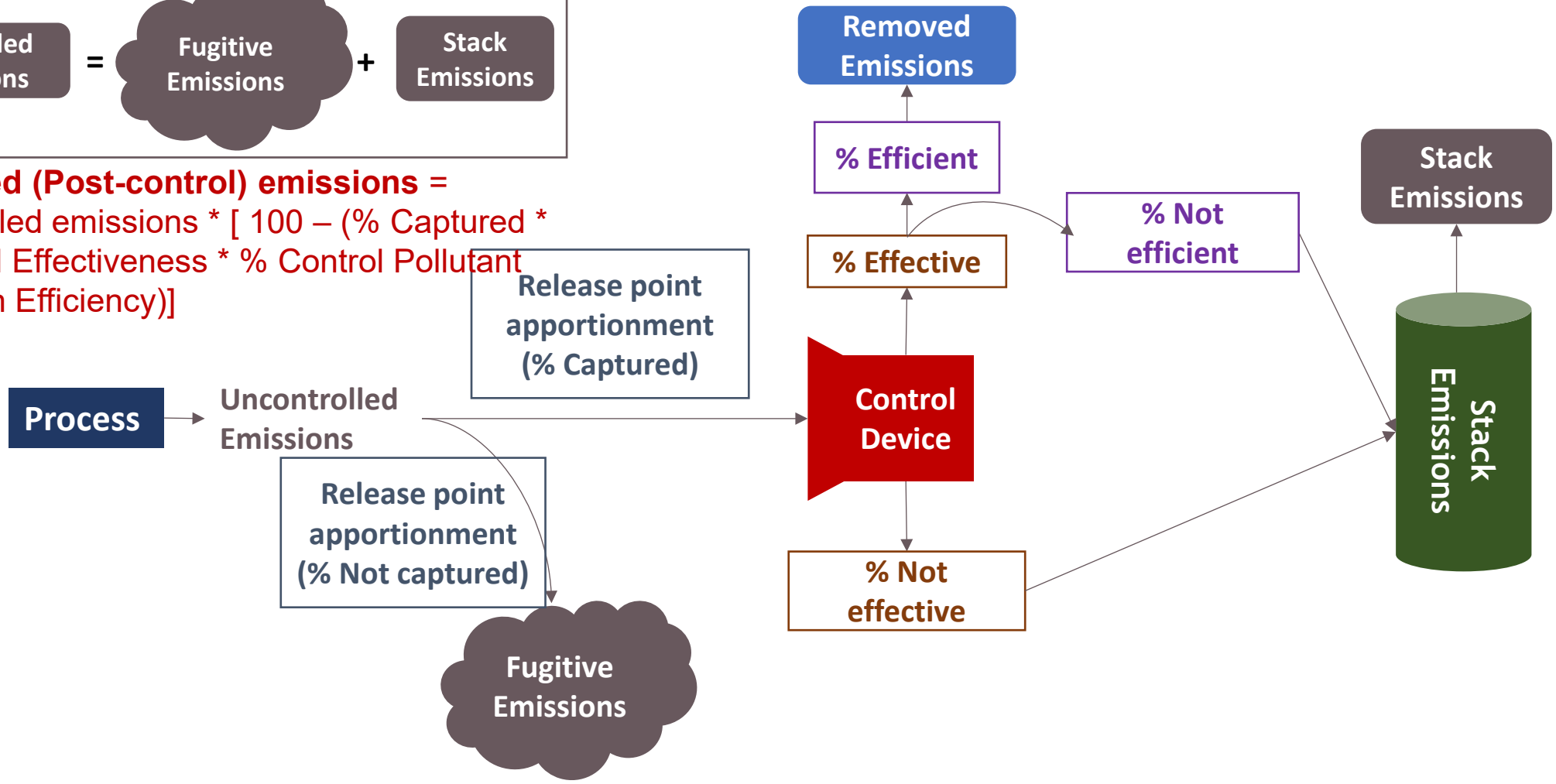
% Not captured = 100 - % Captured

% Not effective = 100 - % Effective

% Not efficient = 100 - % Efficient

Controlled (Post-Control) Emissions

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



Accounting for the Entire Emissions Stream

- Uncontrolled emissions apportioned to release points => fugitives + captured emissions (emissions apportioned to non-fugitive or stack release points)
- 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
- Controlled (Post-control) Emissions = uncontrolled emissions * (1 – captured * control effectiveness * control pollutant reduction efficiency)

Reporting Control Devices

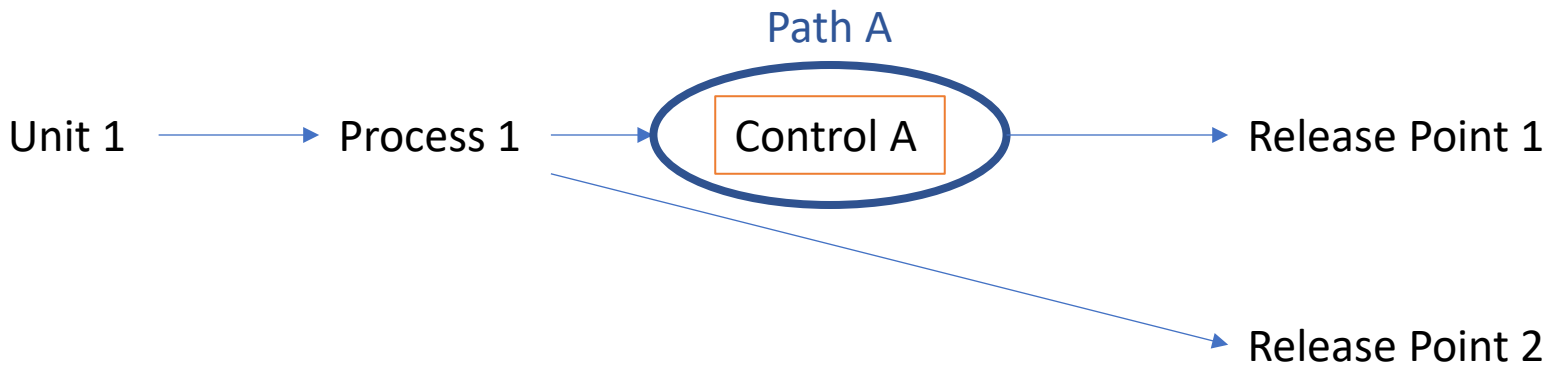
- Individual control devices are listed for the facility.
- Pollutants removed by each control device are listed with it.
- Control device configuration is defined:
  - Single
  - In series
  - In parallel
  - Combinations / Complex Configurations
- Are placed in paths individually or with other control devices to associate them between a units/processes and release points so we may track the emissions stream flow.

Paths

Path: A “container” of one or more control devices that are connected, and through which an emissions stream flows.

- ***Child* Path:** is a path contained within another path
- ***Parent* Path:** contains one or more child paths and may also contain additional control devices. A parent path can be a child path to a larger parent path
- ***Primary or Main* Path**:
  - Contains one or more control devices and/or child paths
  - Is the path ultimately associating the control devices/paths it contains from a unit/process to a release point

Simplest Example of a Path



Path Concepts

Control Path Assignment: the position that a control devices occupies within a path with respect to other control devices contained in that path. The first control device in a path is assigned 1.

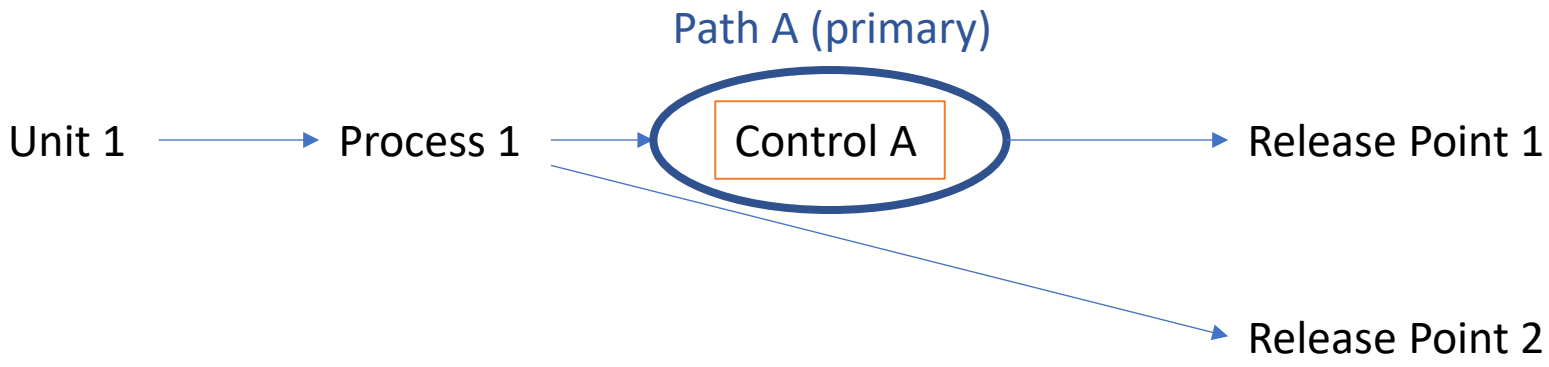
Control Apportionment: the percentage of the emissions that are being directed to the next control or path.

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

Single Control Device

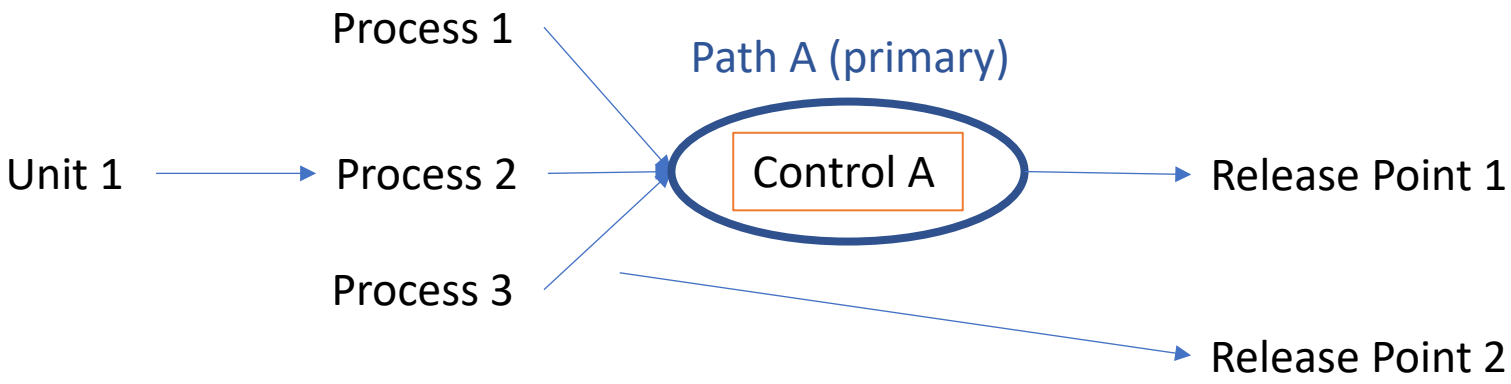
For a single control device one path is needed. The control is placed in that path. That path will be the primary path, and it will associate the process to the release point. Because there's only one control, path assignment is just equal to 1.



Information You Need: release point apportionment (% to Release Point 1 and 2), control effectiveness, pollutant reduction efficiency, path assignment = 1, control apportionment = 100%, path effectiveness = control effectiveness, path efficiency = control efficiency.

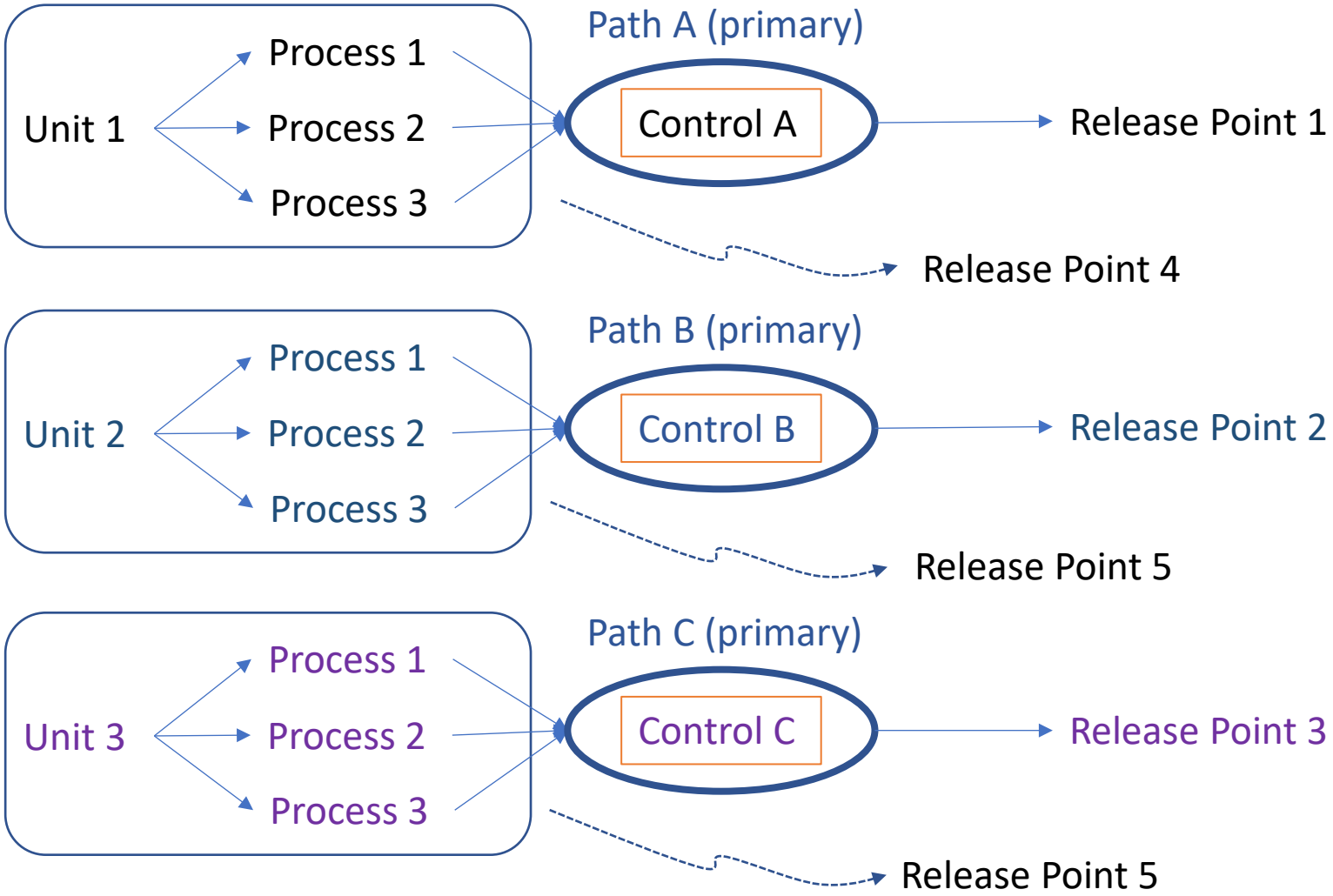
Single Control Device on Multiple Units/Processes

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.



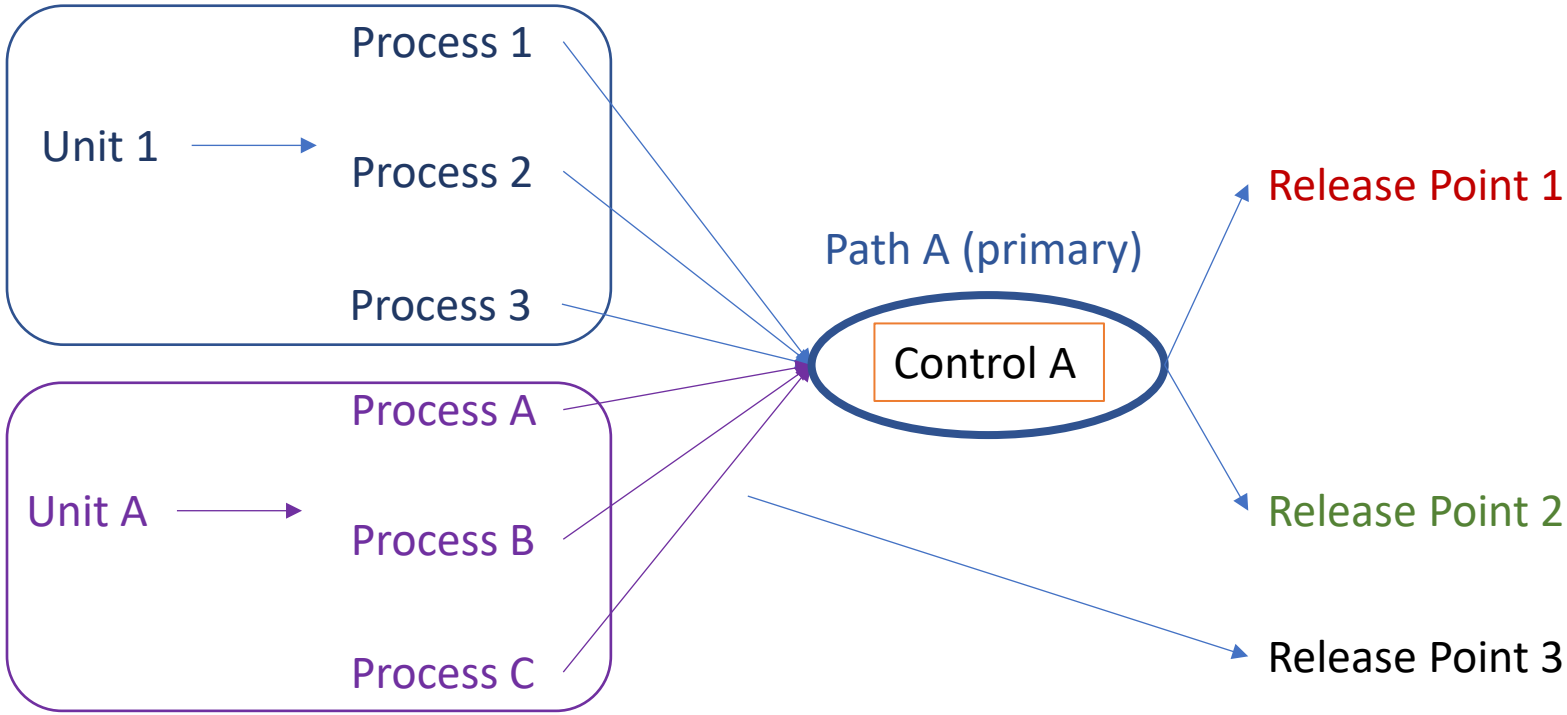
Information You Need: release point apportionment, control effectiveness, pollutant reduction efficiency, path assignment = 1, control apportionment = 100%, path effectiveness = control effectiveness, path efficiency = control efficiency.

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%, path effectiveness = control effectiveness, path efficiency = control efficiency, 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

Information You Need: release point apportionment (% to Release Points 1,2, and 3), control effectiveness, pollutant reduction efficiency, path assignment = 1, control apportionment = 100%, path effectiveness = control effectiveness, path efficiency = control efficiency.

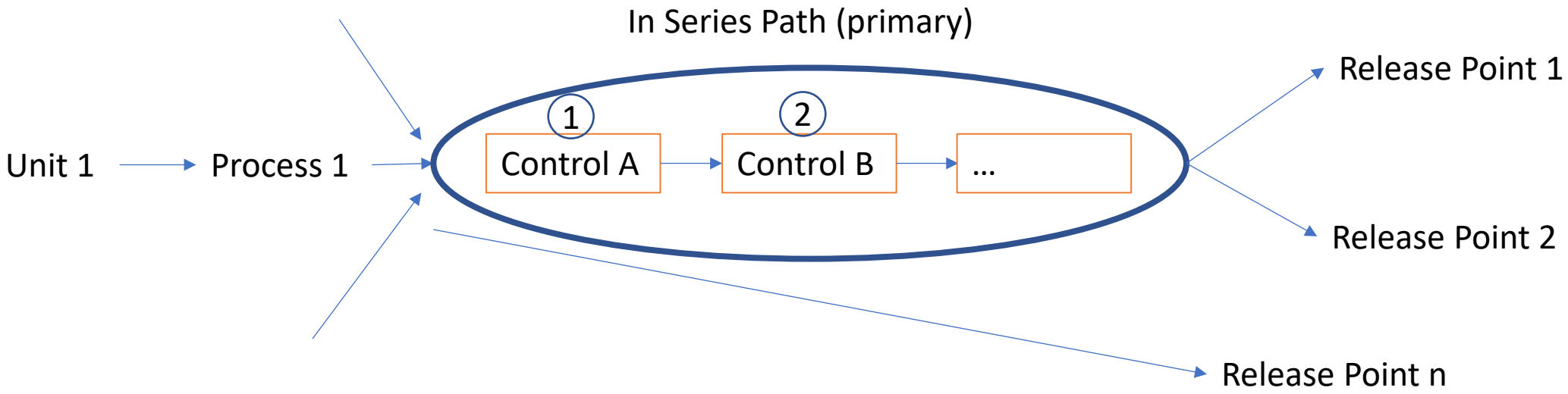
Control Path Assignment

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

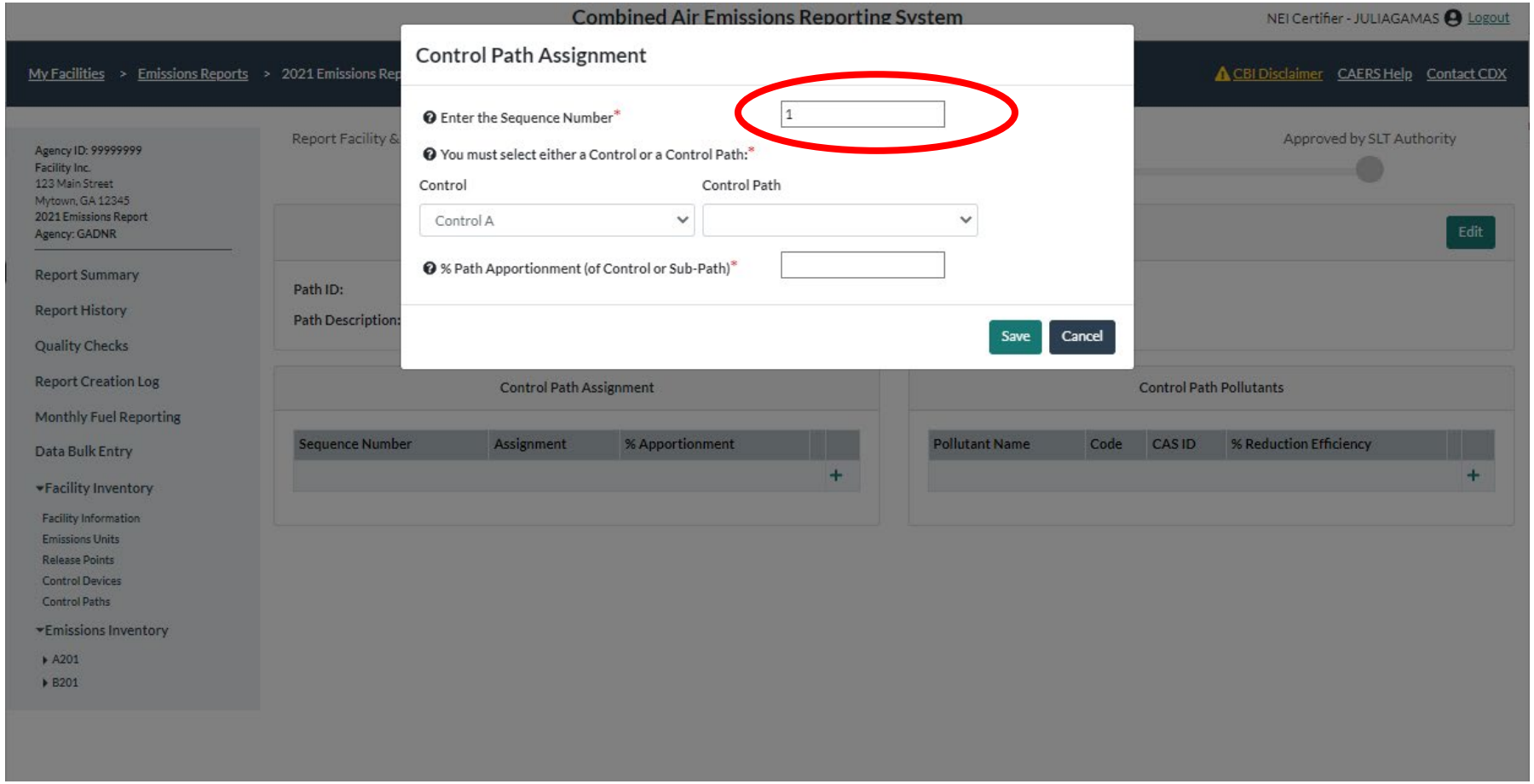
Multiple controls in series can be placed in a path and that path can be reused by many processes going to the same release point(s), if it is the primary path between each process and release point(s), as in the previous slide.



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%. Path efficiency and effectiveness are a combination of the efficiency and effectiveness of the individual controls. Consult your SLT for appropriate calculation method to use. See slides 33-38.

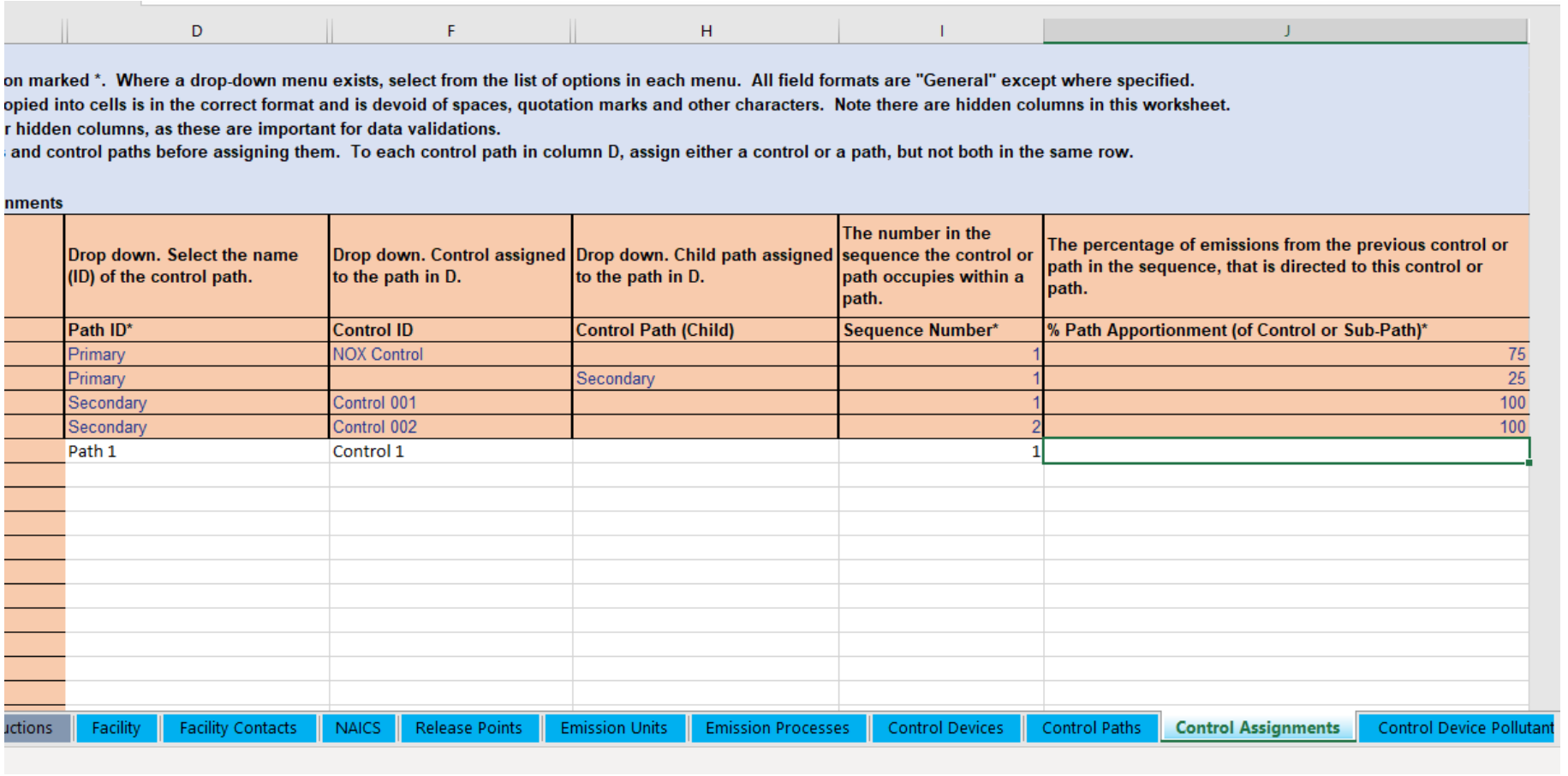
Control Path Assignment - User Interface

Found in the screen for each existing path.



Control Path Assignment - Bulk Upload

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.
opied 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.
r 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.

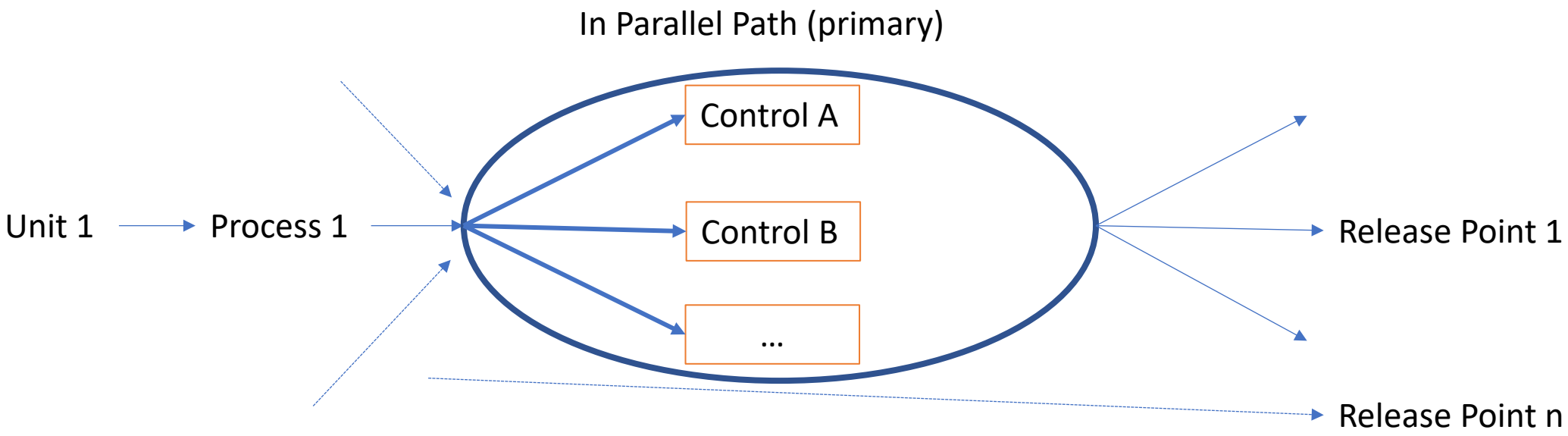
nments

	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	

uctions | Facility | Facility Contacts | NAICS | Release Points | Emission Units | Emission Processes | Control Devices | Control Paths | Control Assignments | Control Device Pollutant

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). Path efficiency and effectiveness are a combination of the efficiency and effectiveness of the individual controls. Consult your SLT for appropriate calculation method to use. See slides 33 to 38.

Control Apportionment

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

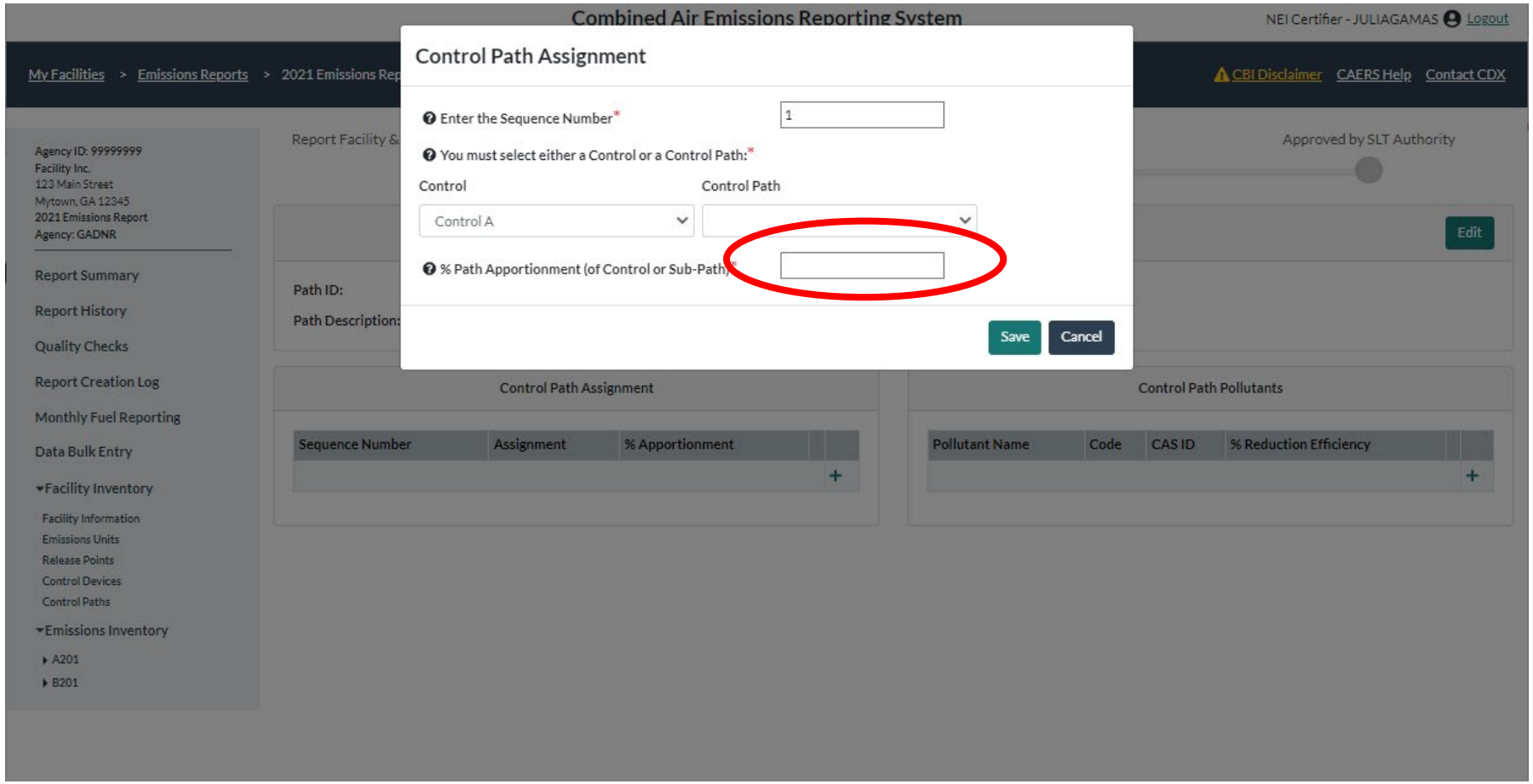
- % of the emissions are routed to the next control or path.
- 100% of the emissions are tracked, a control apportionment percentage < 100% for a control device means that some emission are also being routed to another control device or path.
- Are entered when entering control path assignment data.

Release Point Apportionment (revisited)

- Different than control apportionment
- 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 (captured)
    - Fugitive
  - 100% of the original emissions must be assigned to one or more release points

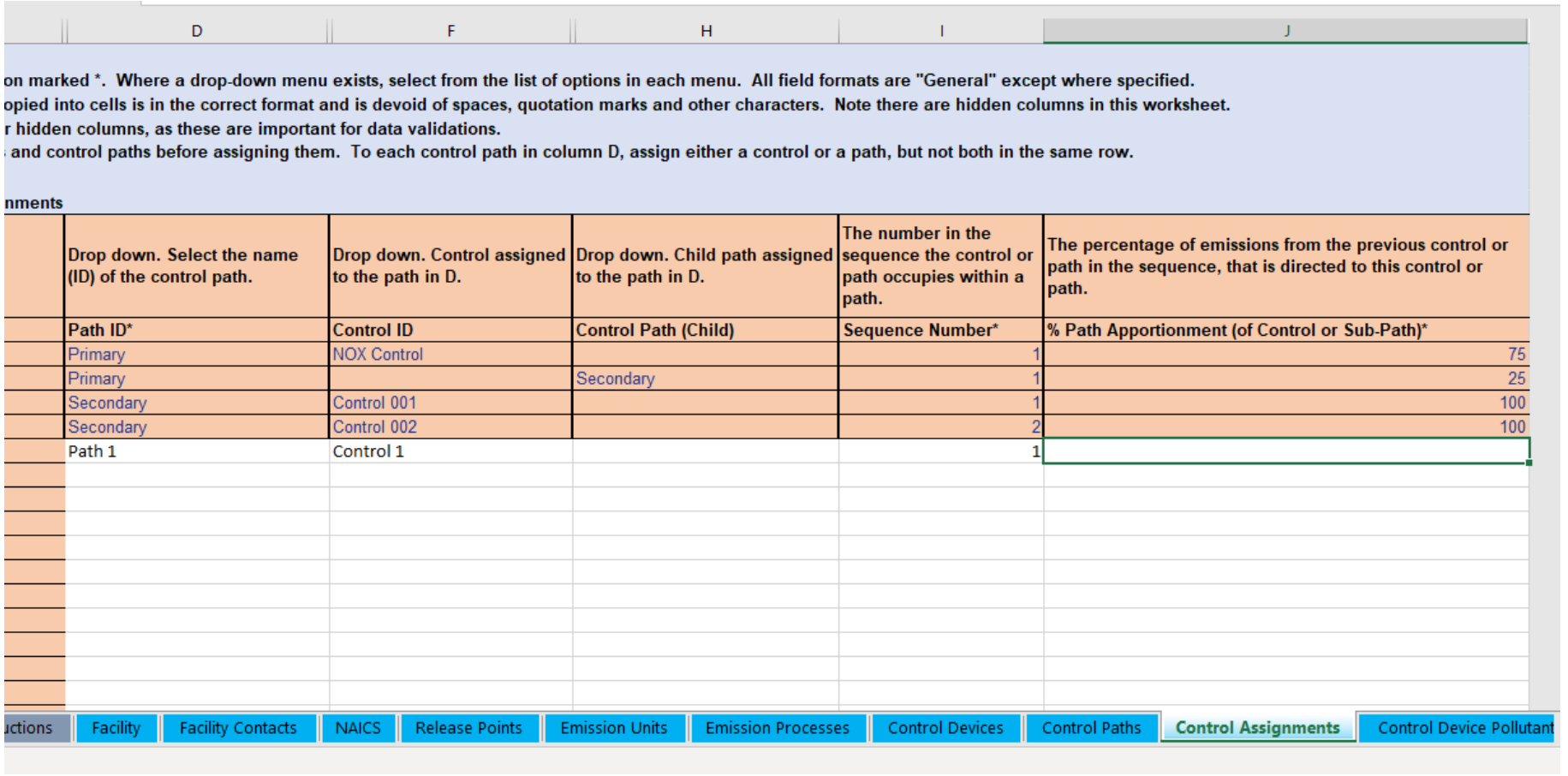
Control Apportionment - User Interface

Found in the screen for each existing path.



Control Apportionment - Bulk Upload

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.
opied 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.
r 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.

nments

	D	F	H	I	J
	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	

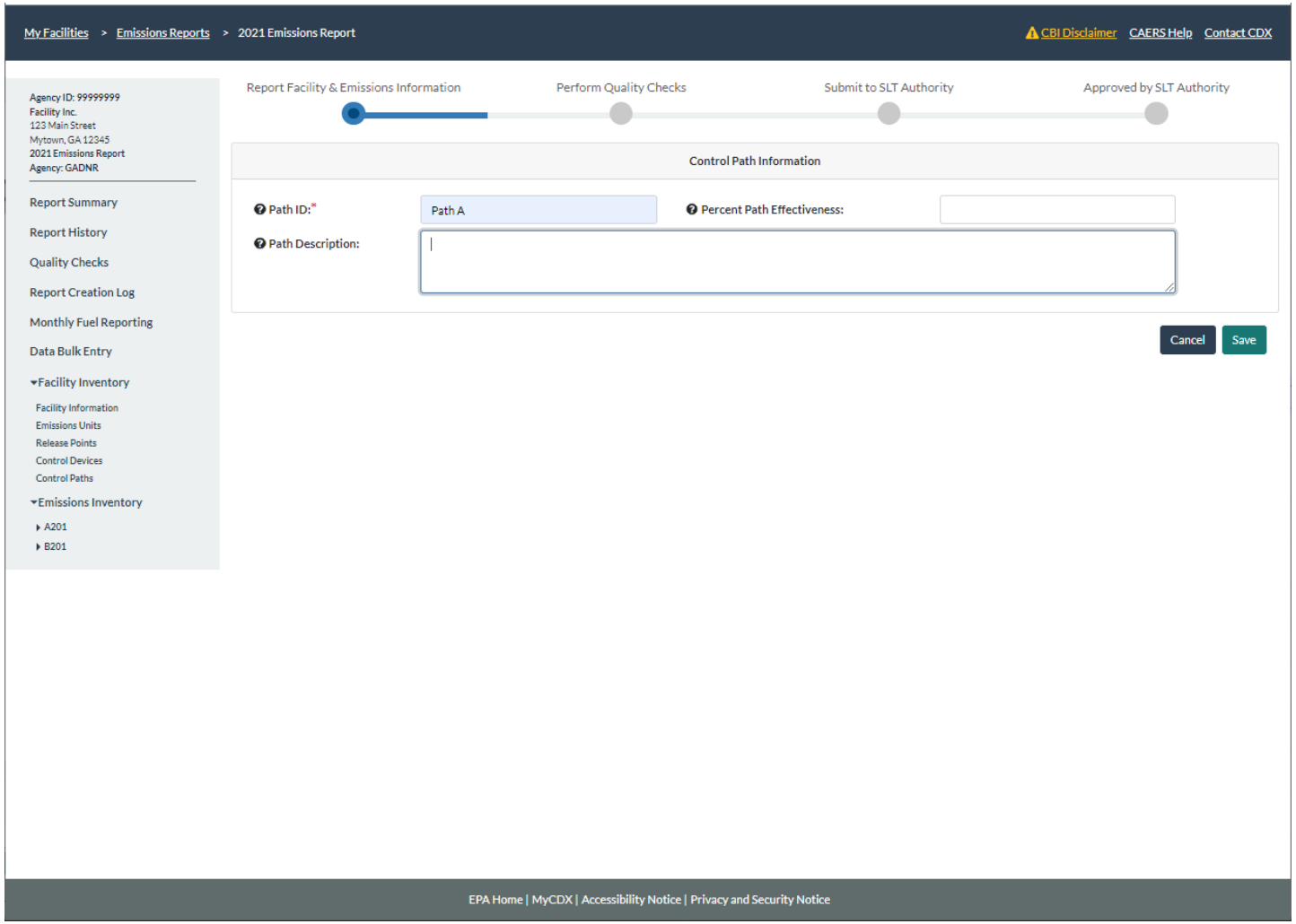
uctions | Facility | Facility Contacts | NAICS | Release Points | Emission Units | Emission Processes | Control Devices | Control Paths | Control Assignments | Control Device Pollutant

Percent Path Effectiveness

- *Required* on main paths (those associated with a release point apportionment)
- If only one control device is in the path, it is equal to the percent control effectiveness for that control.
- Depends control device configuration (in sequence, parallel, a combination):
  - In series: the multiplication of % control effectiveness,
  - 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 configuration.
- Entered in the screen for each path.

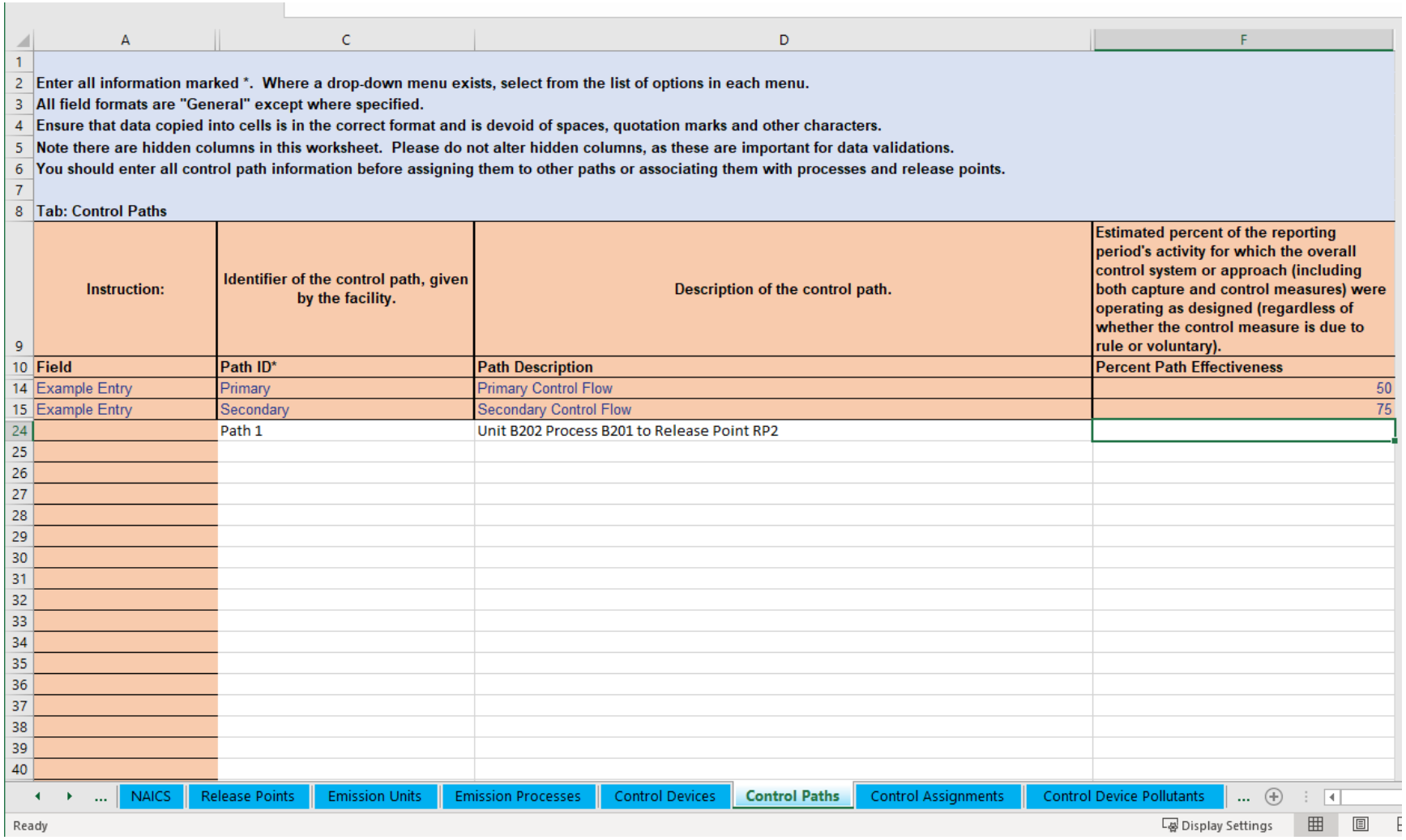
Path Effectiveness - User Interface

Found in the screen for each path.



Path Effectiveness - Bulk Upload

Found in the "Control Paths" tab.

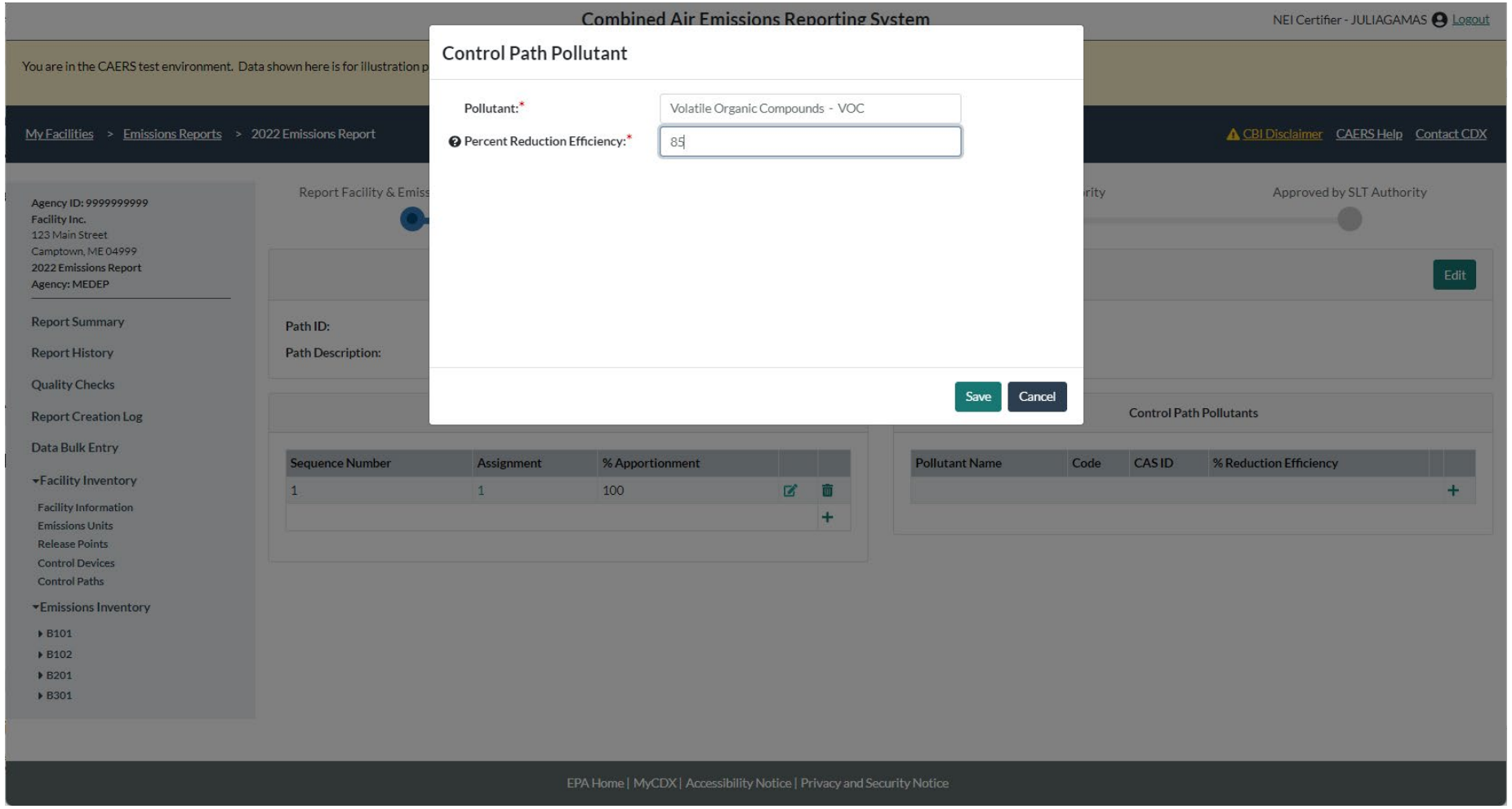


	A	C	D	F
1				
2	Enter all information marked *. Where a drop-down menu exists, select from the list of options in each menu.			
3	All field formats are "General" except where specified.			
4	Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other 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			
9	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).
10	Field	Path ID*	Path Description	Percent Path Effectiveness
14	Example Entry	Primary	Primary Control Flow	50
15	Example Entry	Secondary	Secondary Control Flow	75
24		Path 1	Unit B202 Process B201 to Release Point RP2	
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

Path Pollutant Percent Reduction Efficiency

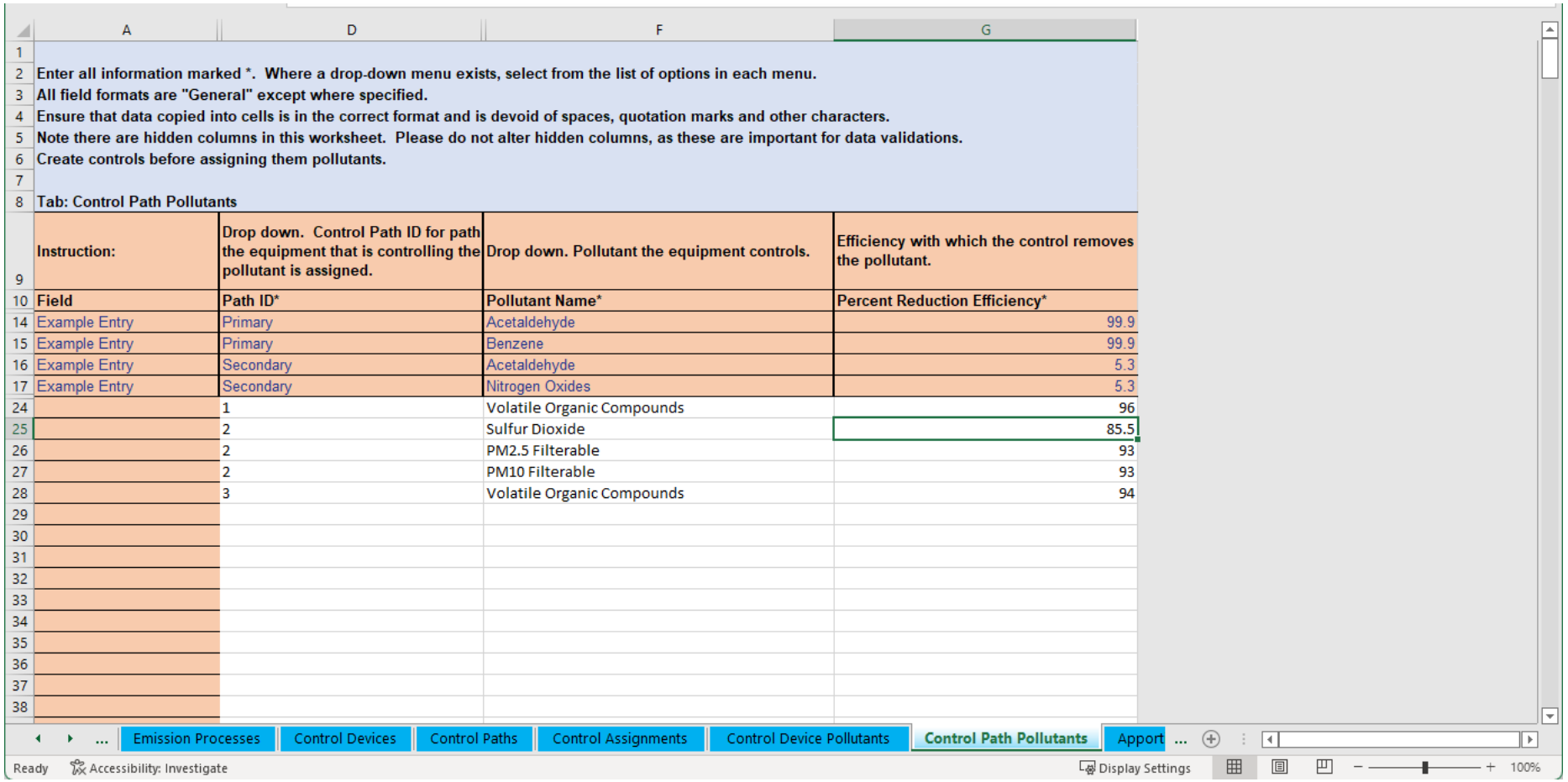
- *Required* on main paths (those associated with a release point apportionment)
- If there is only one control device, then it is the same as the control percent reduction efficiency.
- If there are more than one control device reducing the same pollutant, it is a combination of the reduction efficiency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

Path Pollutants - User Interface



Can be added in the screen for an existing path.

Path Pollutants - Bulk Upload



	A	D	F	G
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			
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	94
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				

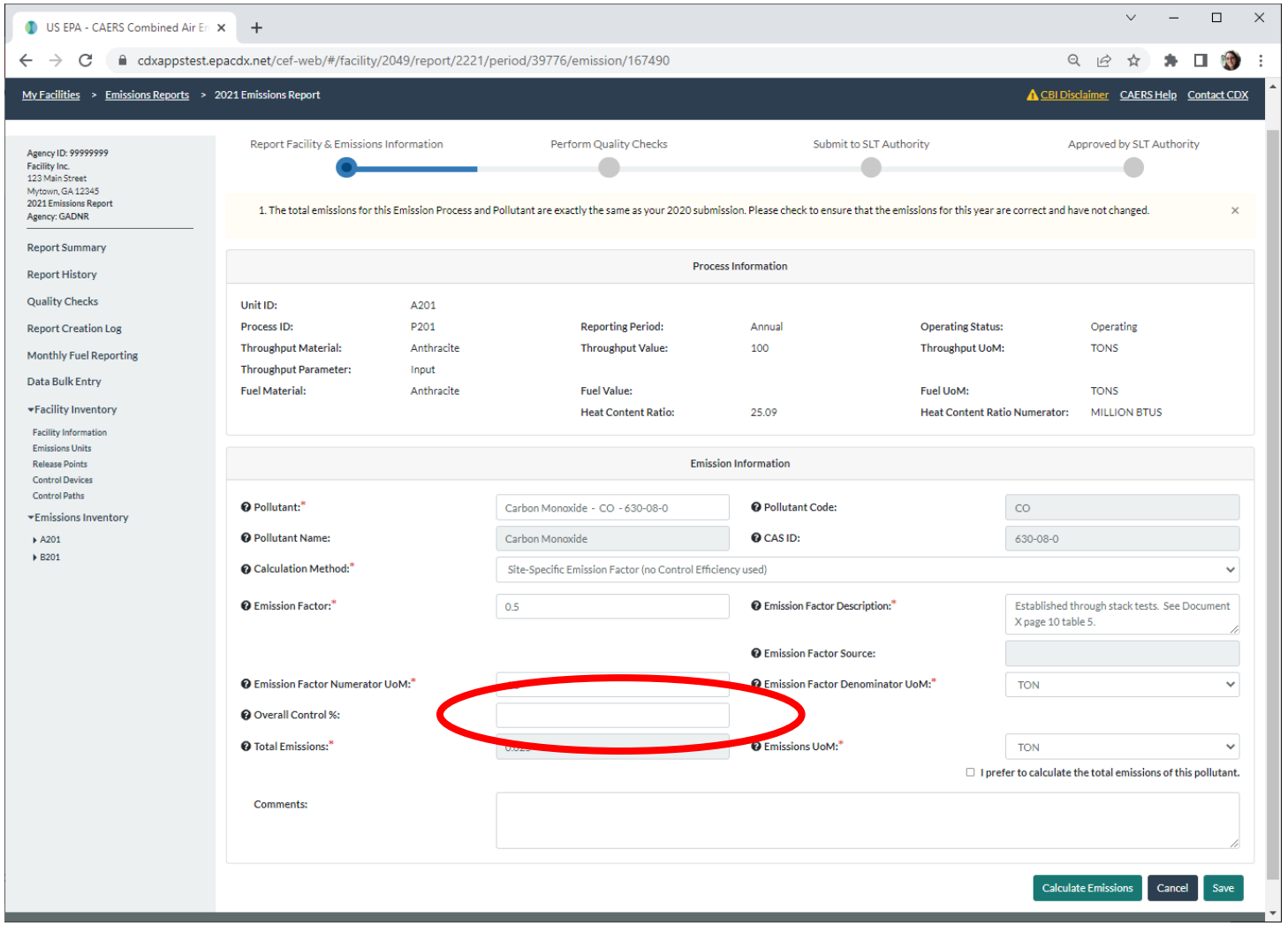
Can be entered, for an existing path, in the “Control Path Pollutants” tab of the bulk upload template.

Overall Percent Control - CAERS

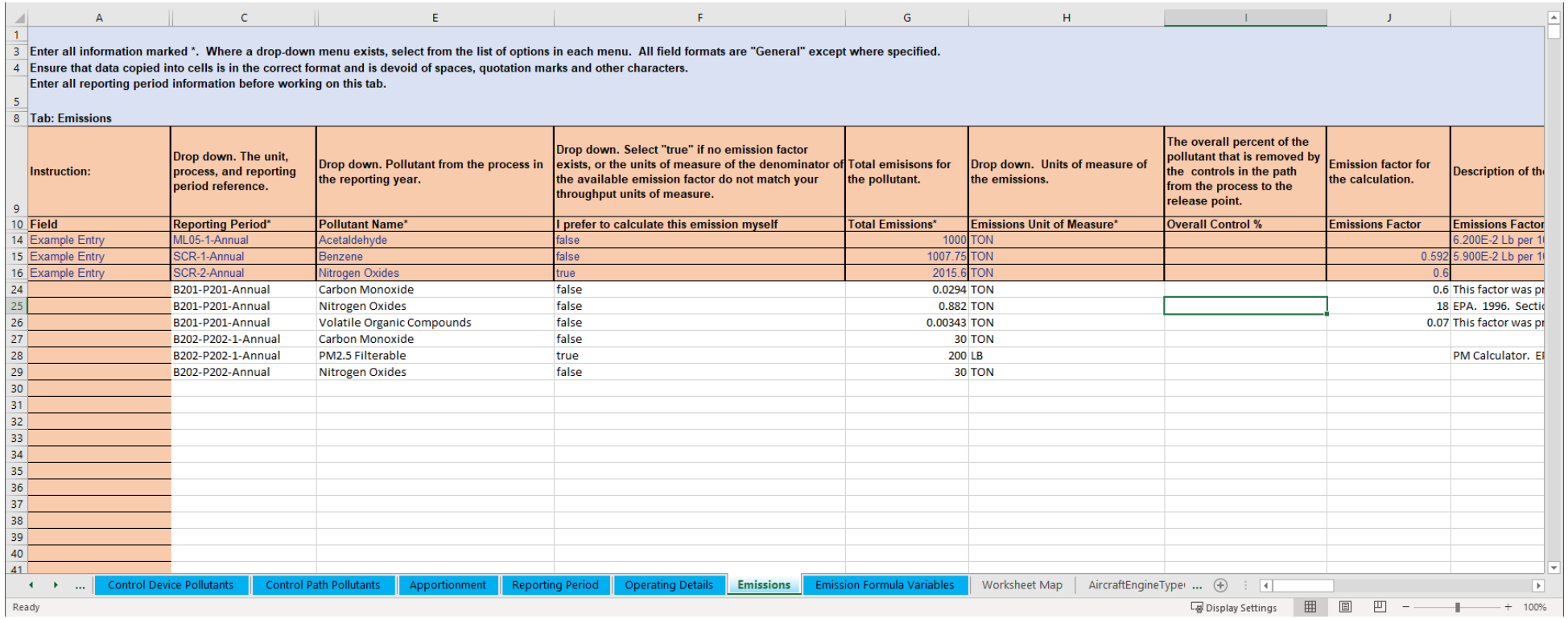
- *Not* required. CAERS will factor in the overall percent control in your emissions calculation *if* you have entered it:
  - Single Control Overall Percent Control = percent captured * efficiency * effectiveness.
  - Parallel Controls that control the same pollutant: add individual overall %
  - In 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.
- Select a method of calculation that does *not* include control reductions to avoid double counting the reductions. E.g. EPA Factor (no control efficiency).

Overall Percent Control - User Interface

Found in the emissions estimation screen.



Overall Percent Control - 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 emisisons 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 th
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			

Control Device Pollutants | Control Path Pollutants | Apportionment | Reporting Period | Operating Details | Emissions | Emission Formula Variables | Worksheet Map | AircraftEngineType

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

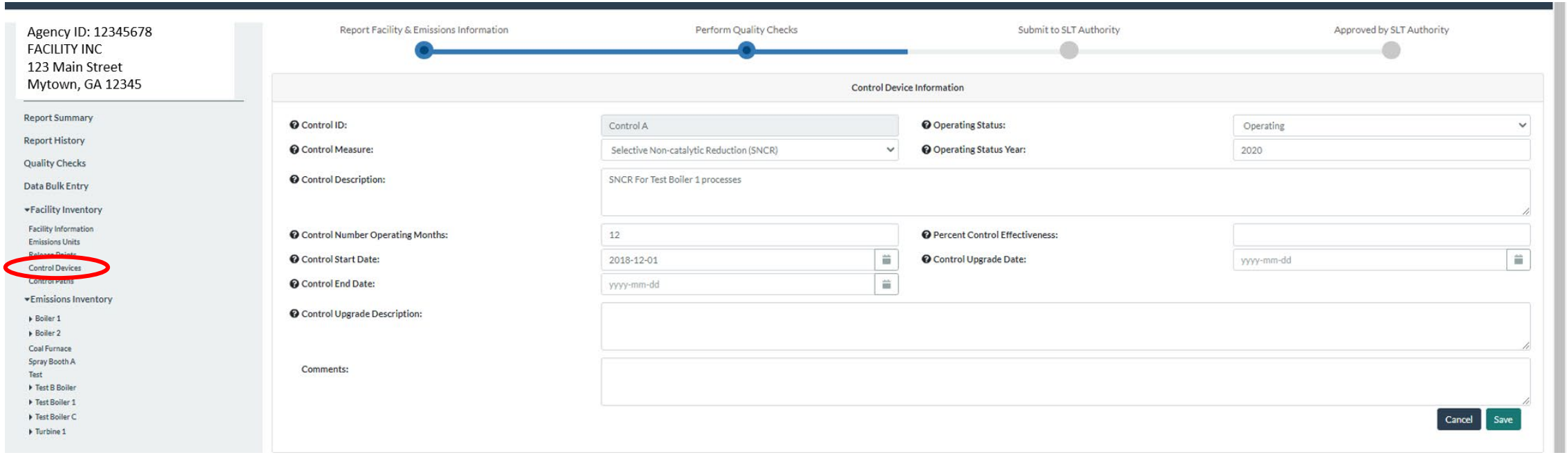
Steps to Enter Data

General Data Entry Steps for Control Devices and Paths in CAERS

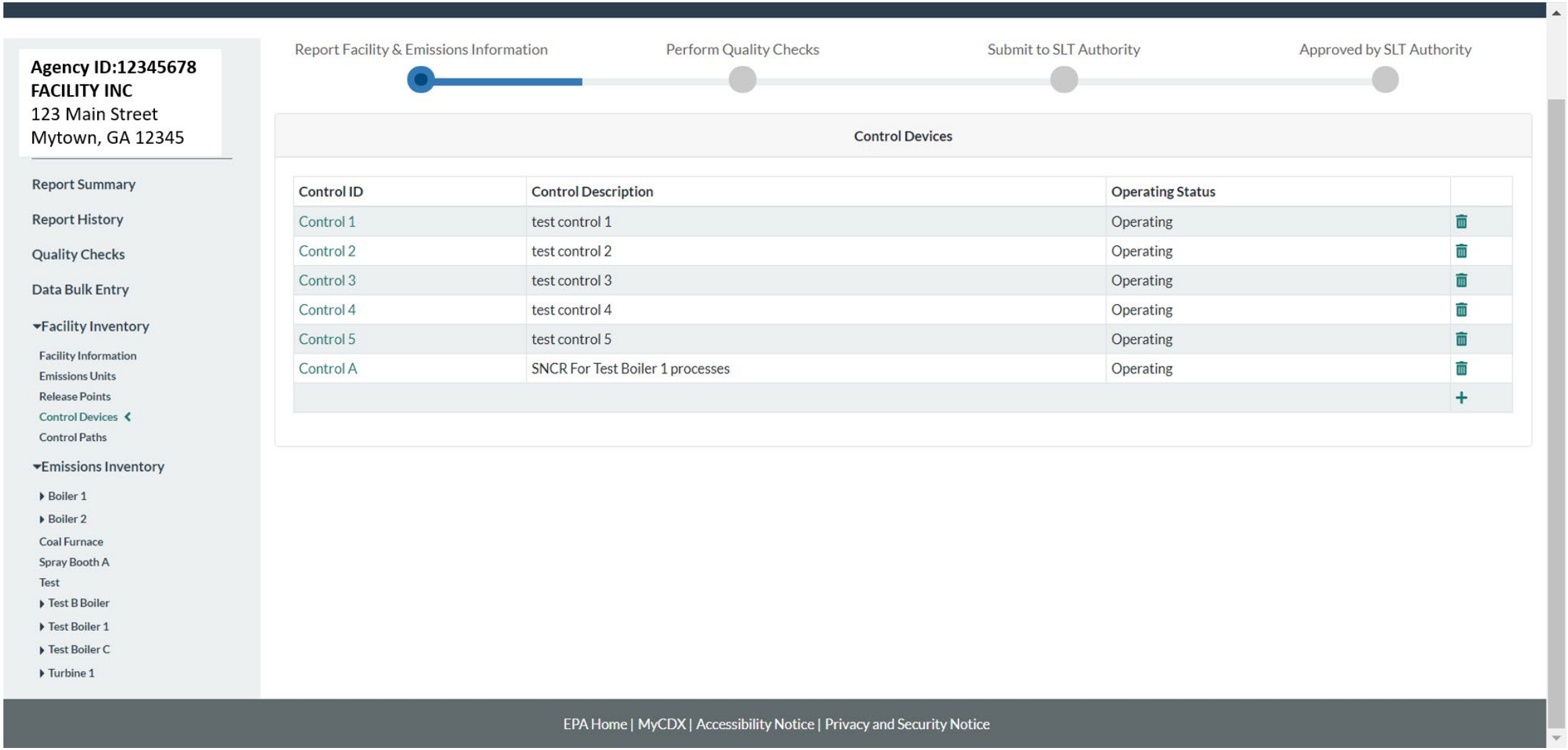
1. Ensure unit/process and release point data are available first.
2. Enter control device data: effectiveness, pollutant and % pollutant reduction efficiency
3. Place the control into a path: assignment (sequence #), control apportionment
   - Control into path
   - Child path into parent path
   - 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

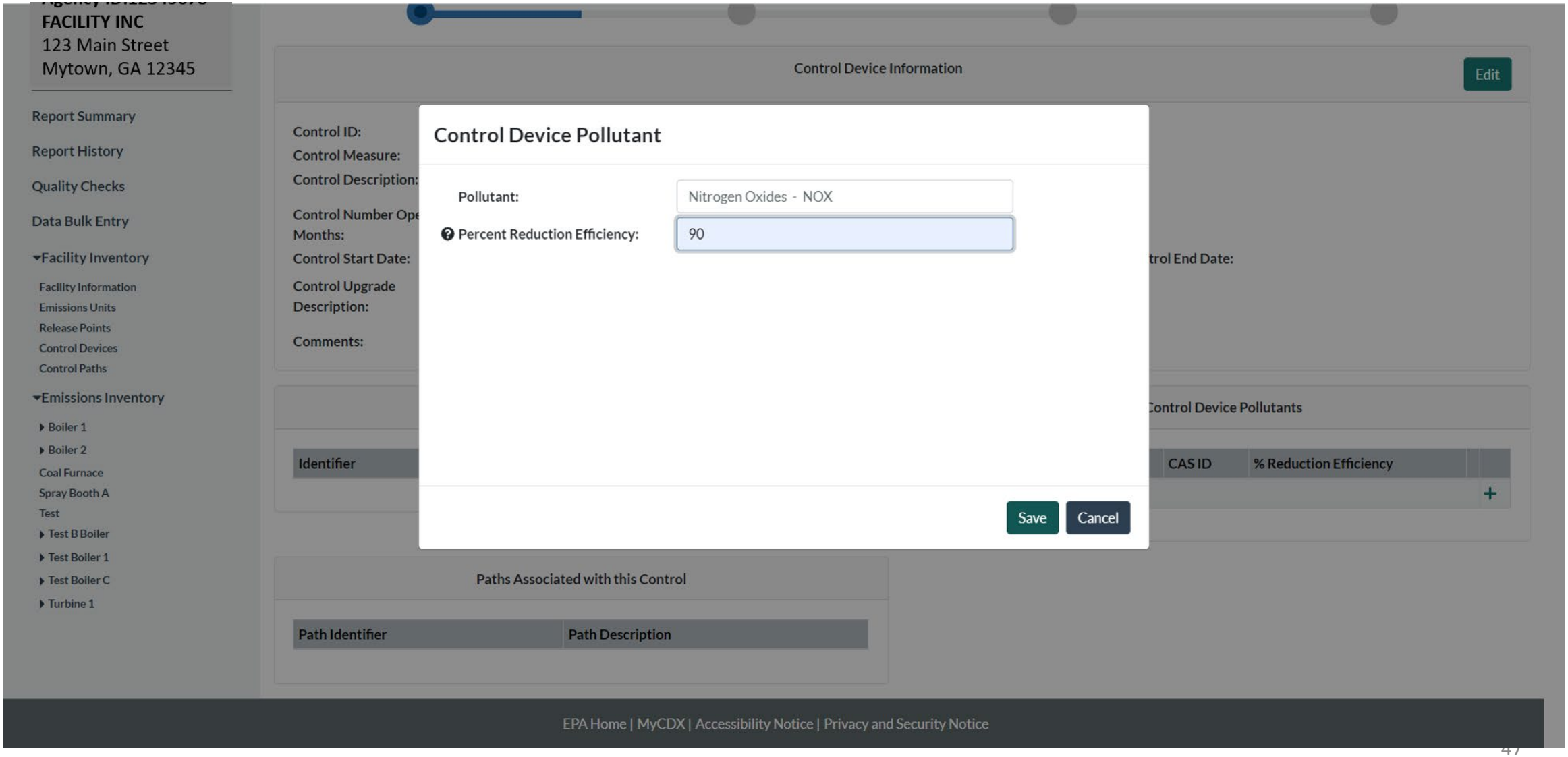
Select Control Devices and Add New Control Device



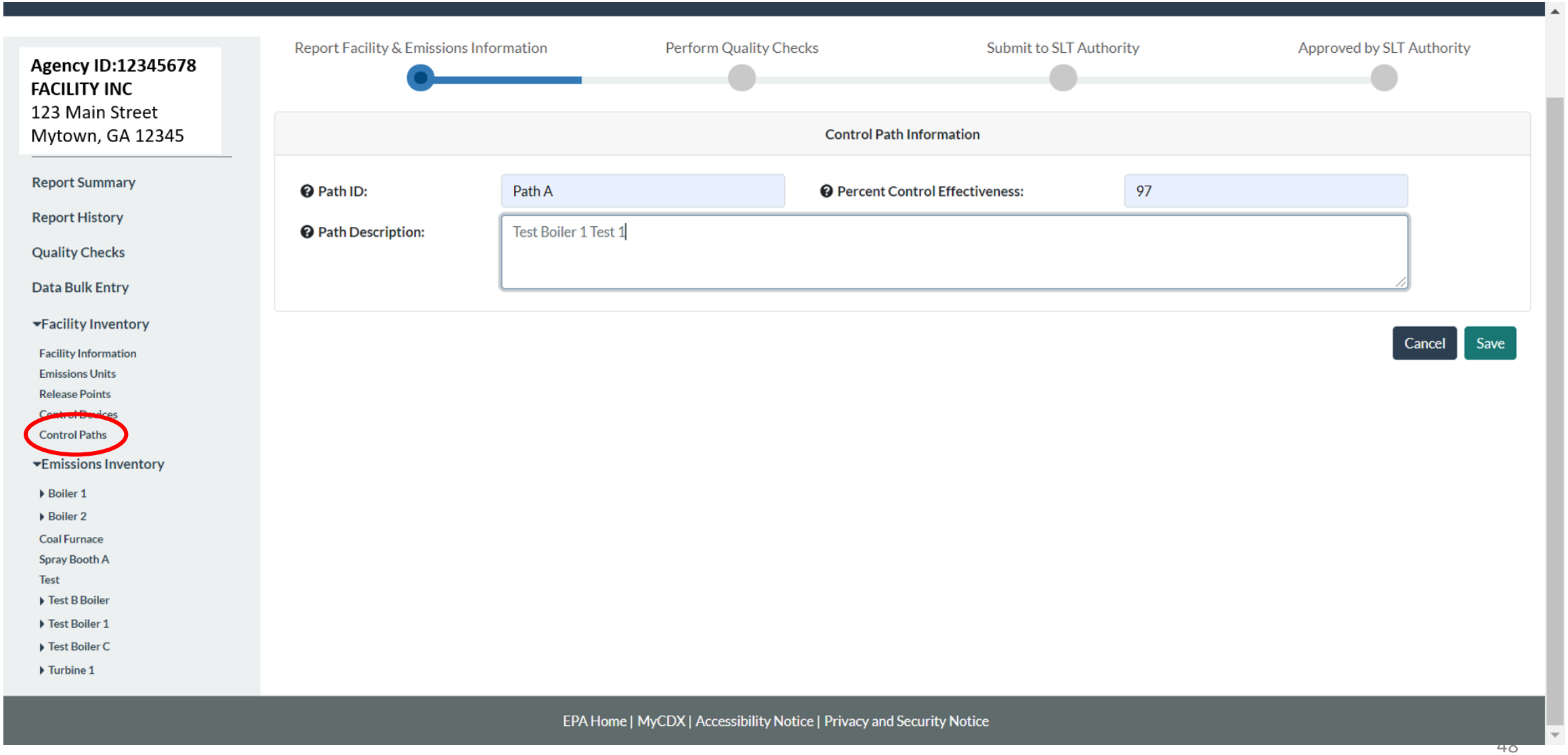
See New Control in List of Control Devices



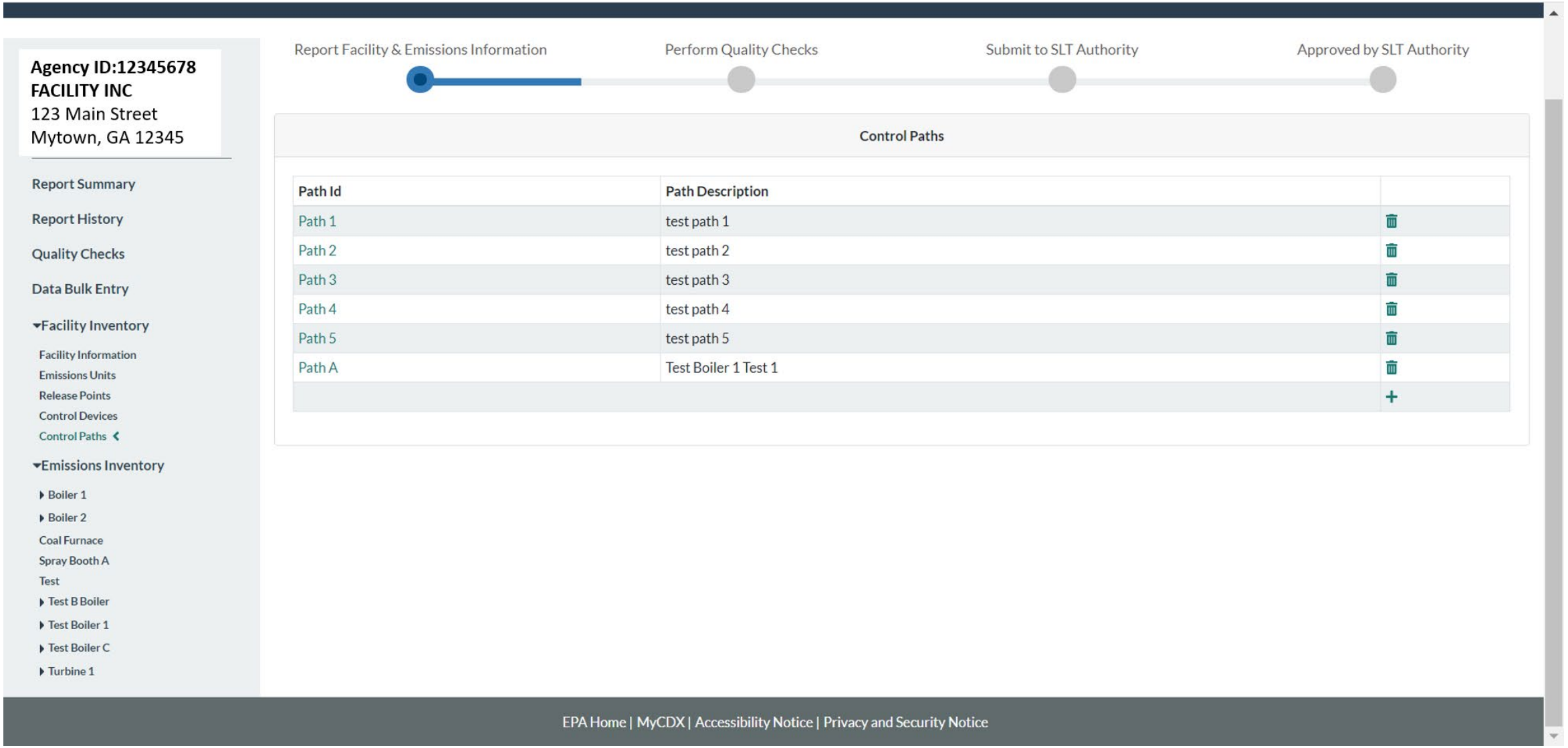
Select Control Device and Add Pollutant Data



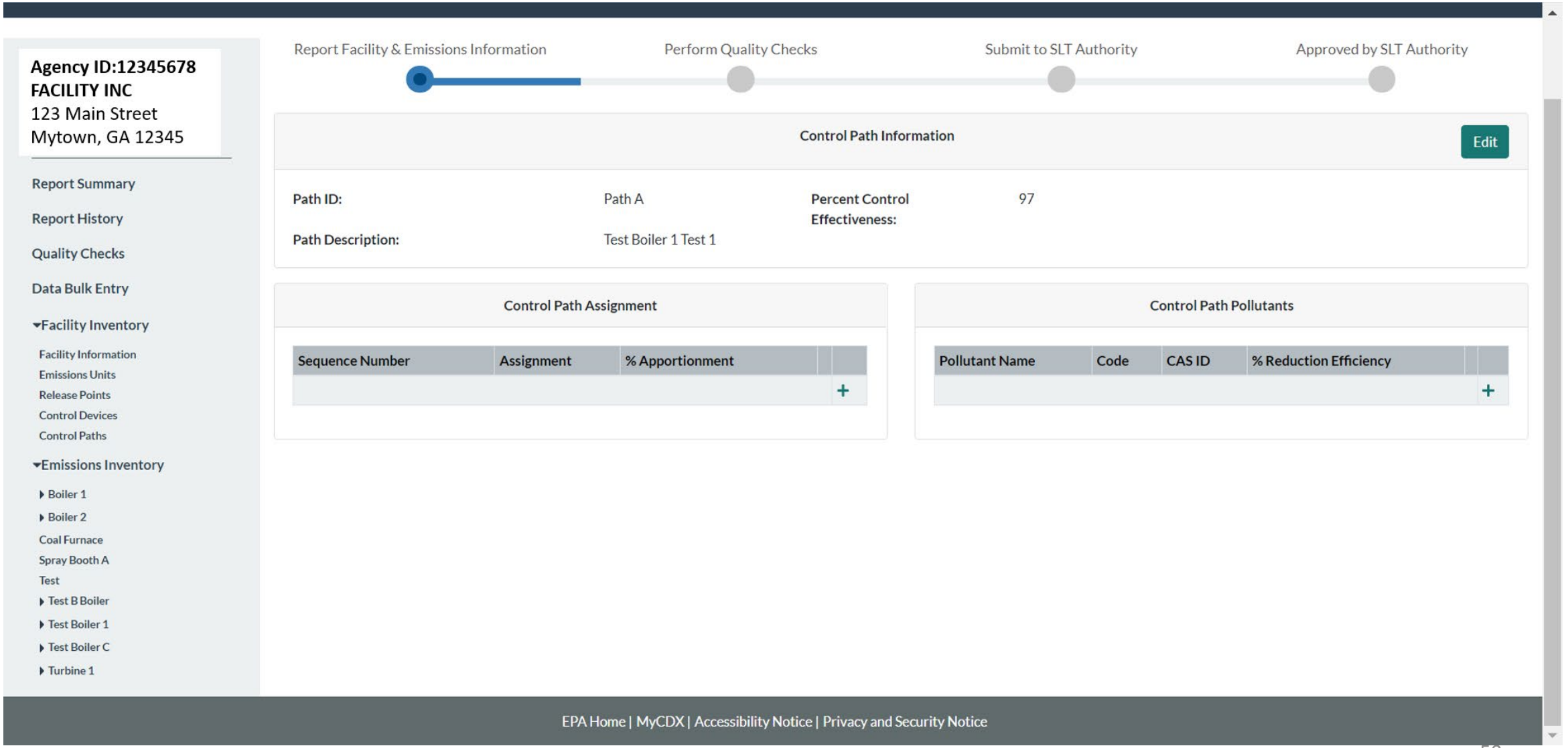
Select Control Paths and Add New Path



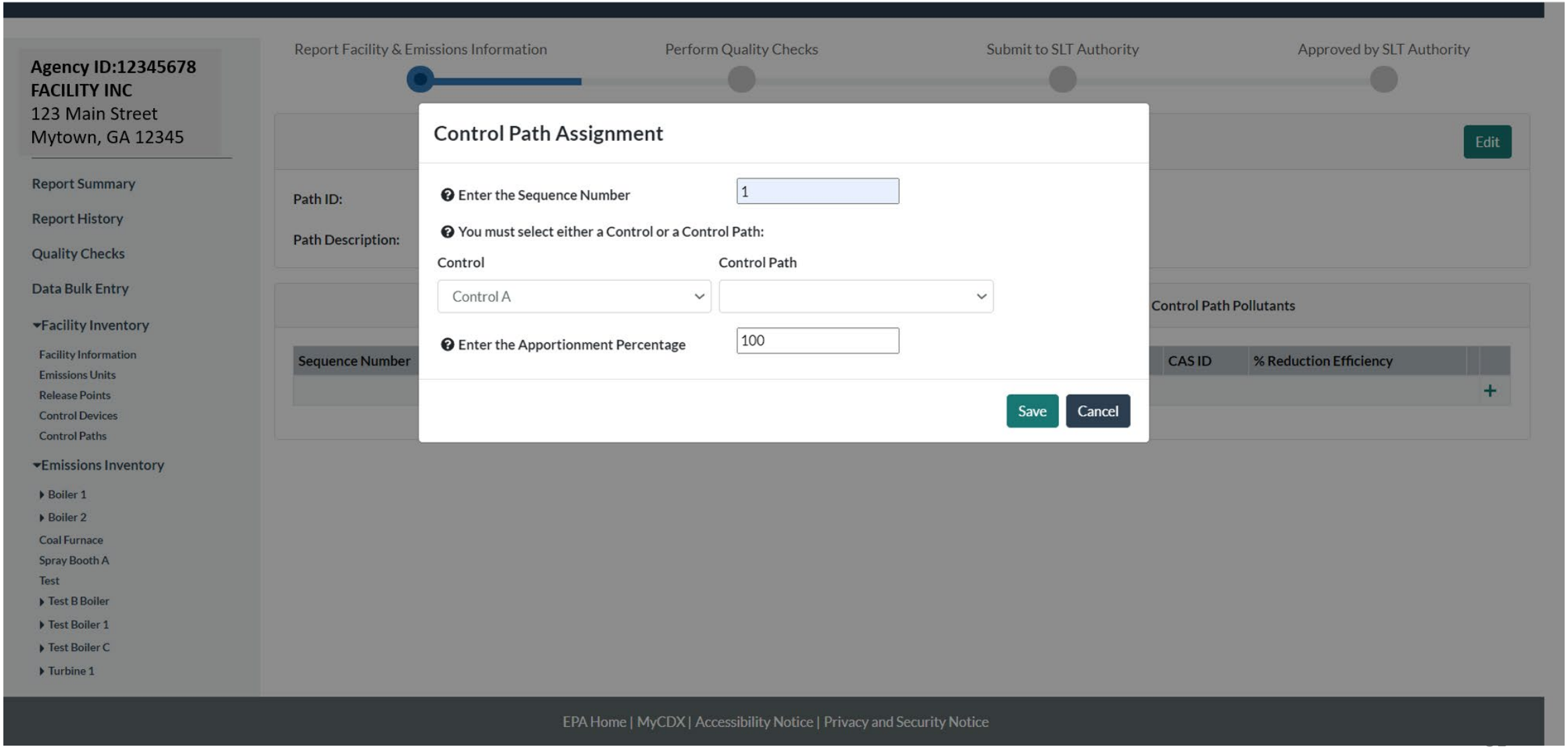
See New Path in List of Paths



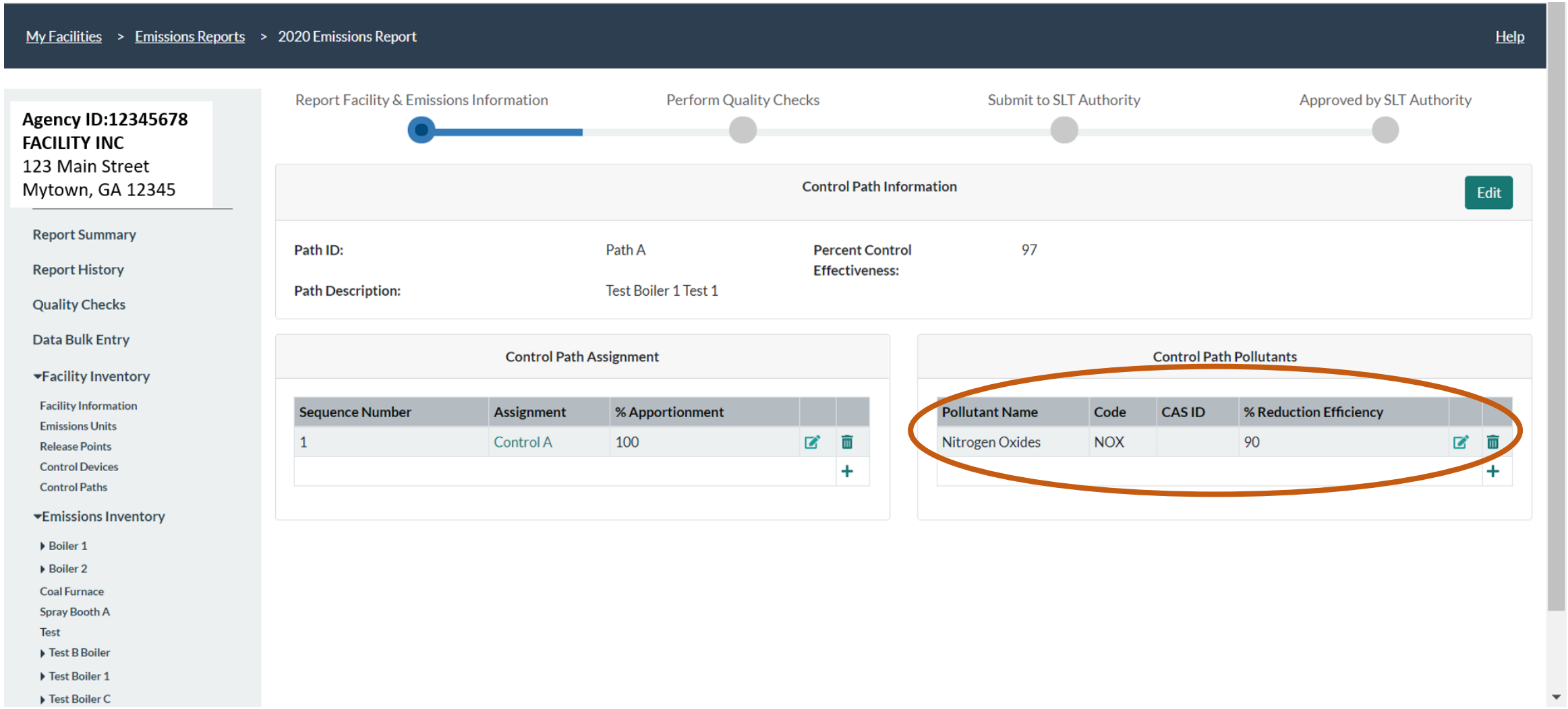
Select Path and Add Data



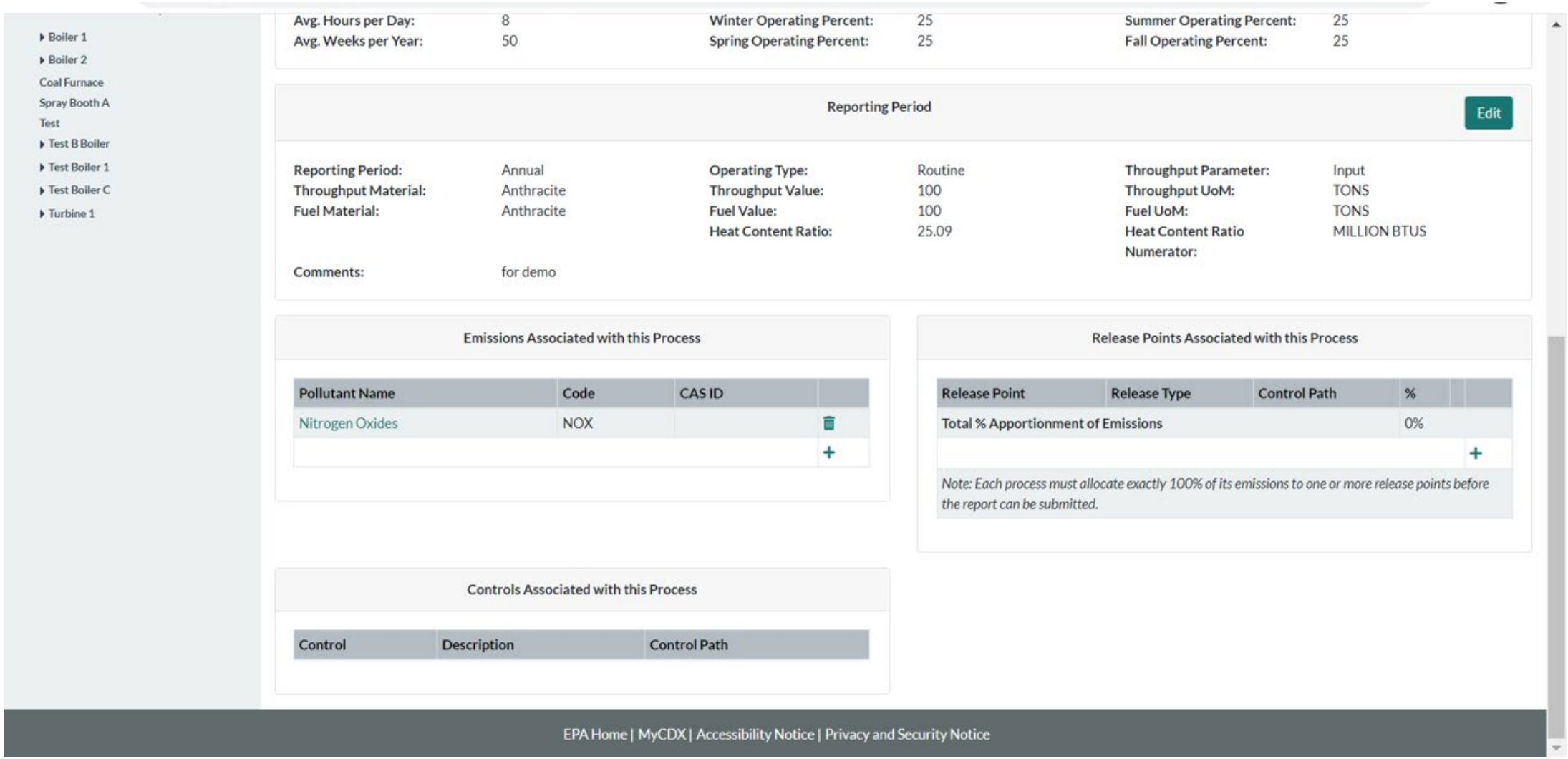
Control Path Assignment Data



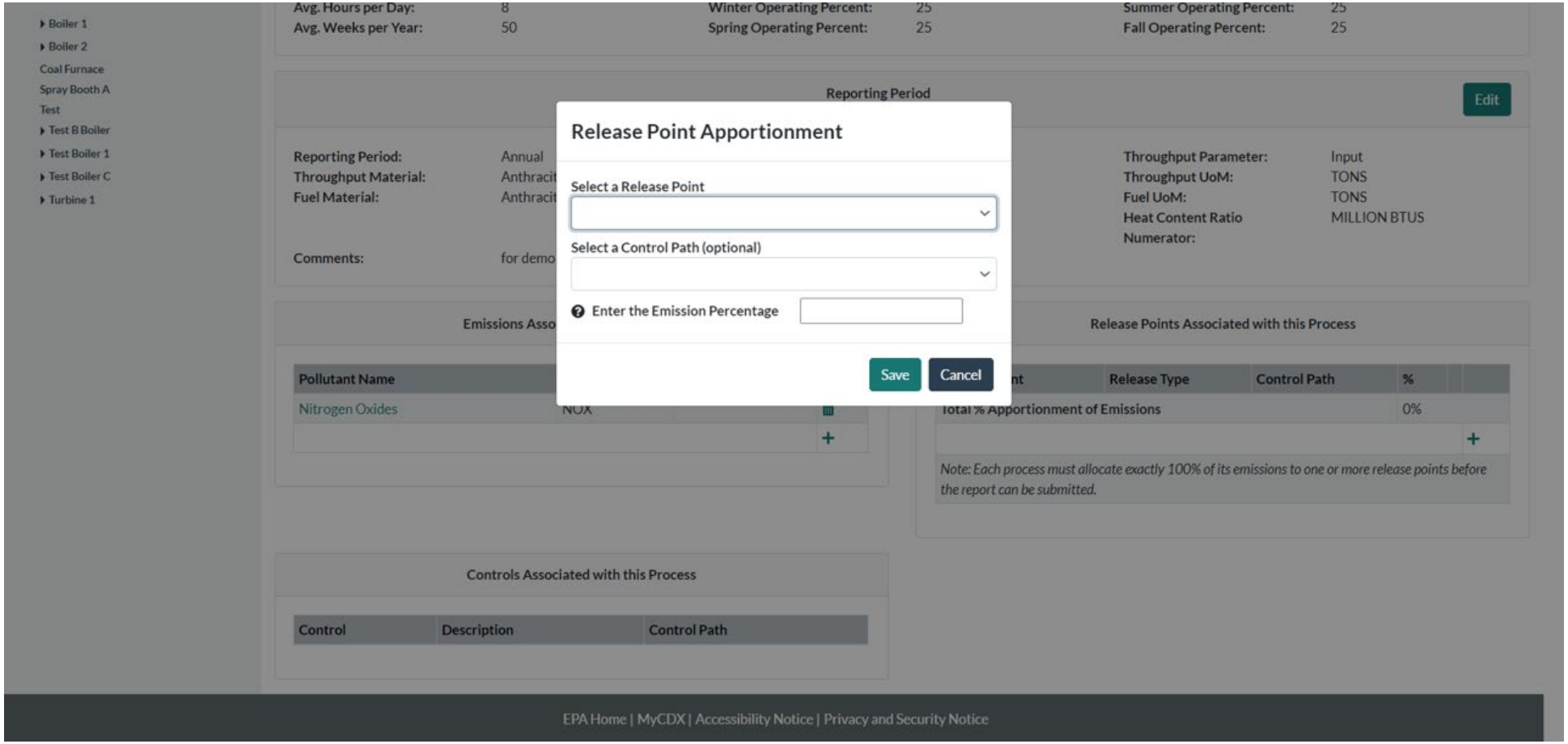
Add Control Path Pollutants



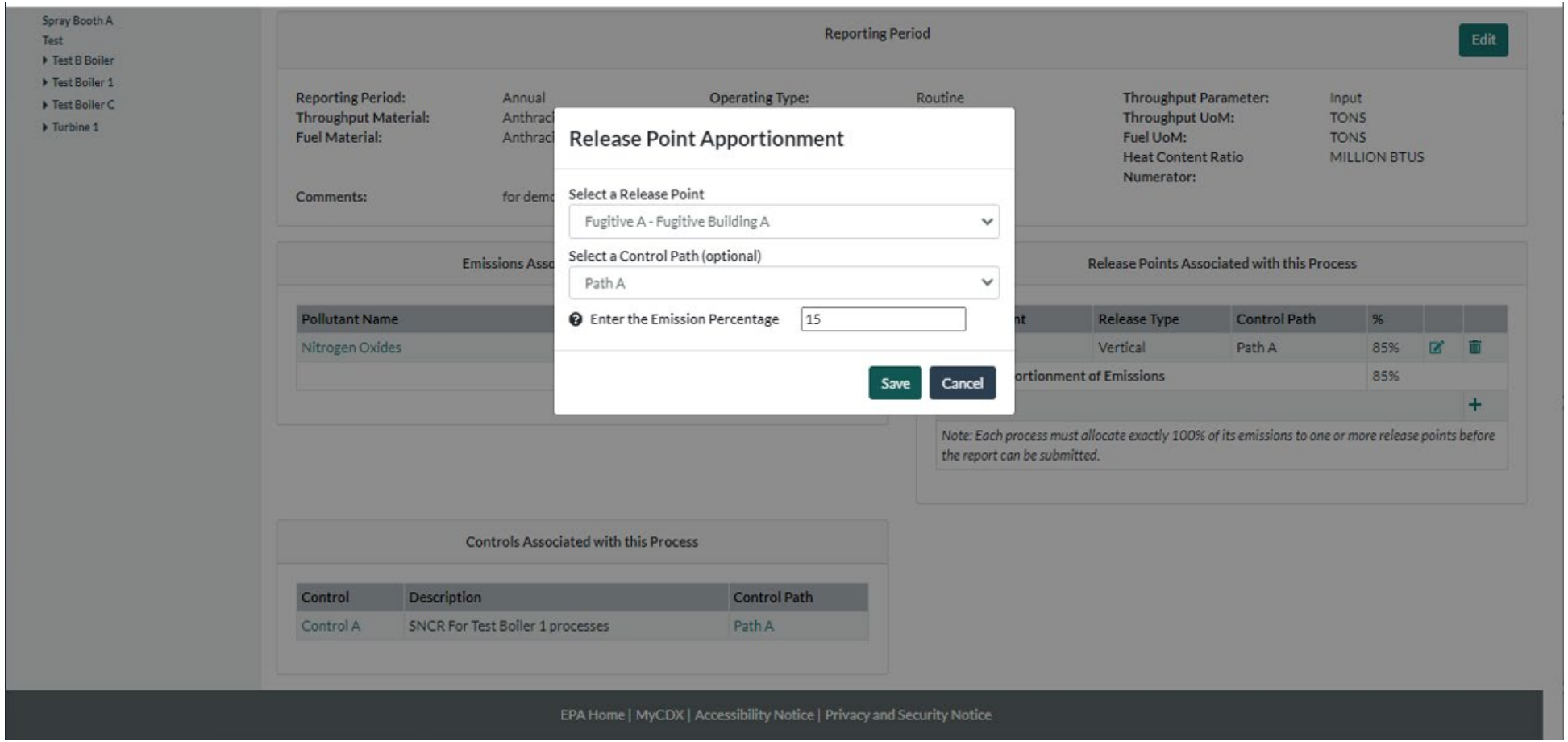
Select the Process for the Control Device



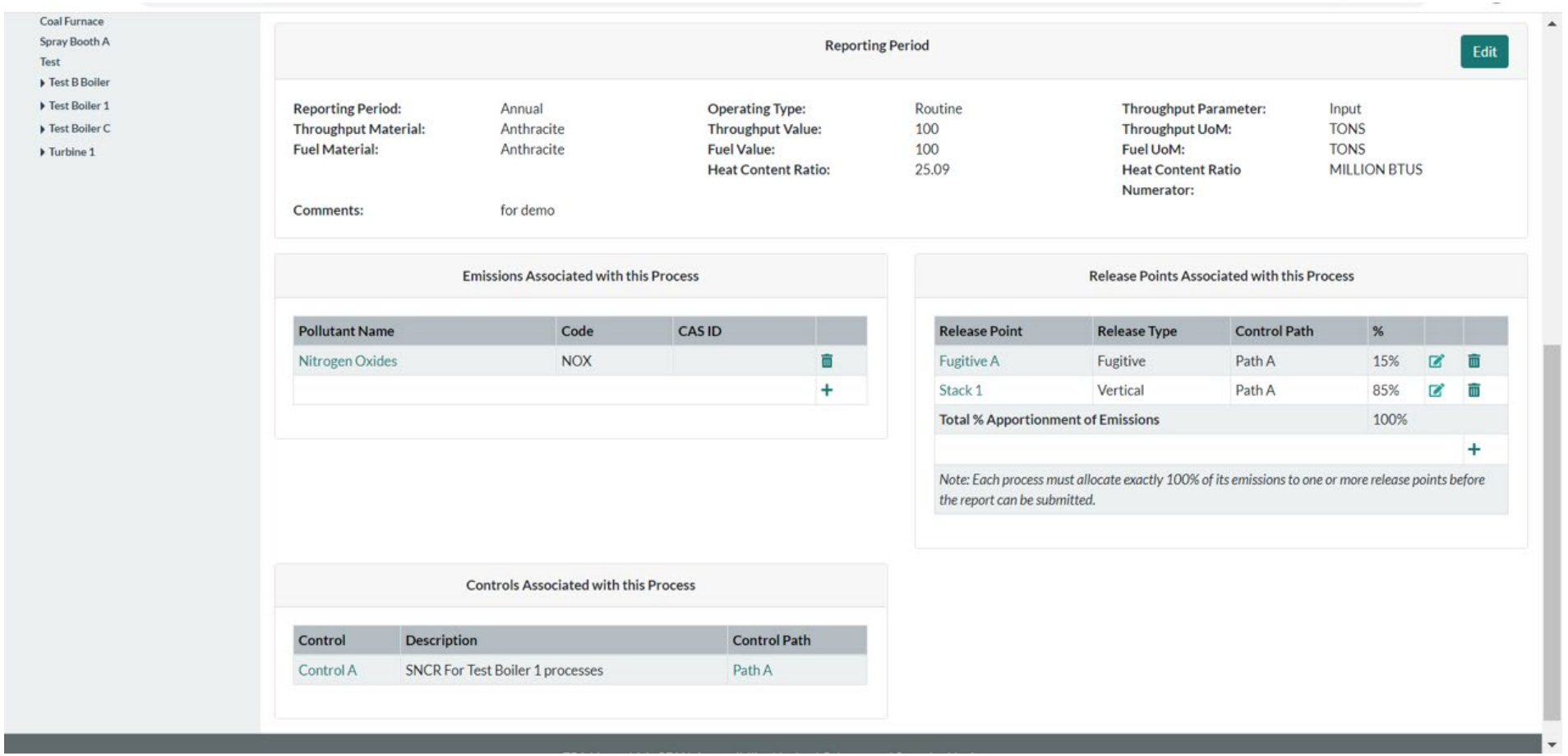
Select Release Point for that Process



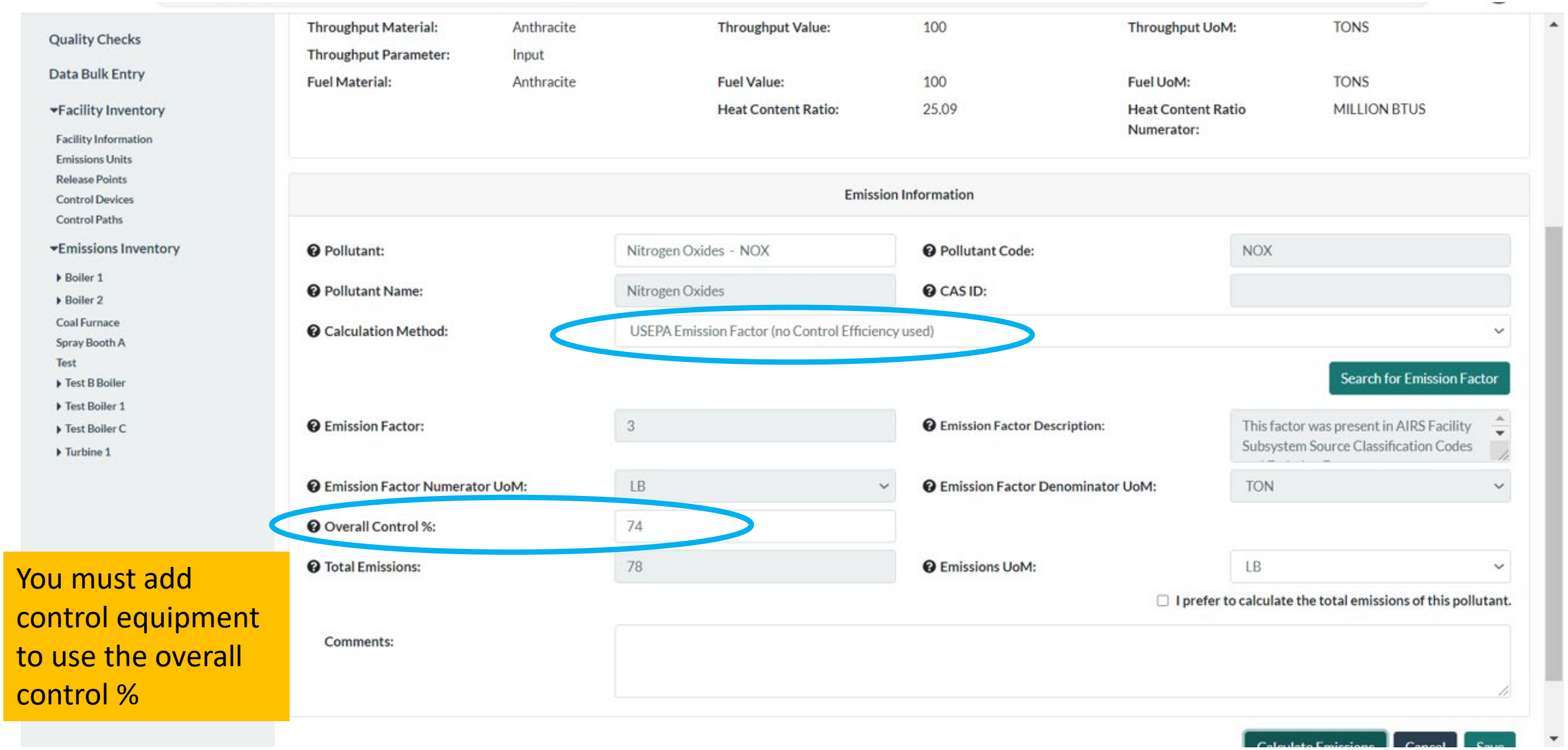
Associate Process and Release Point



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

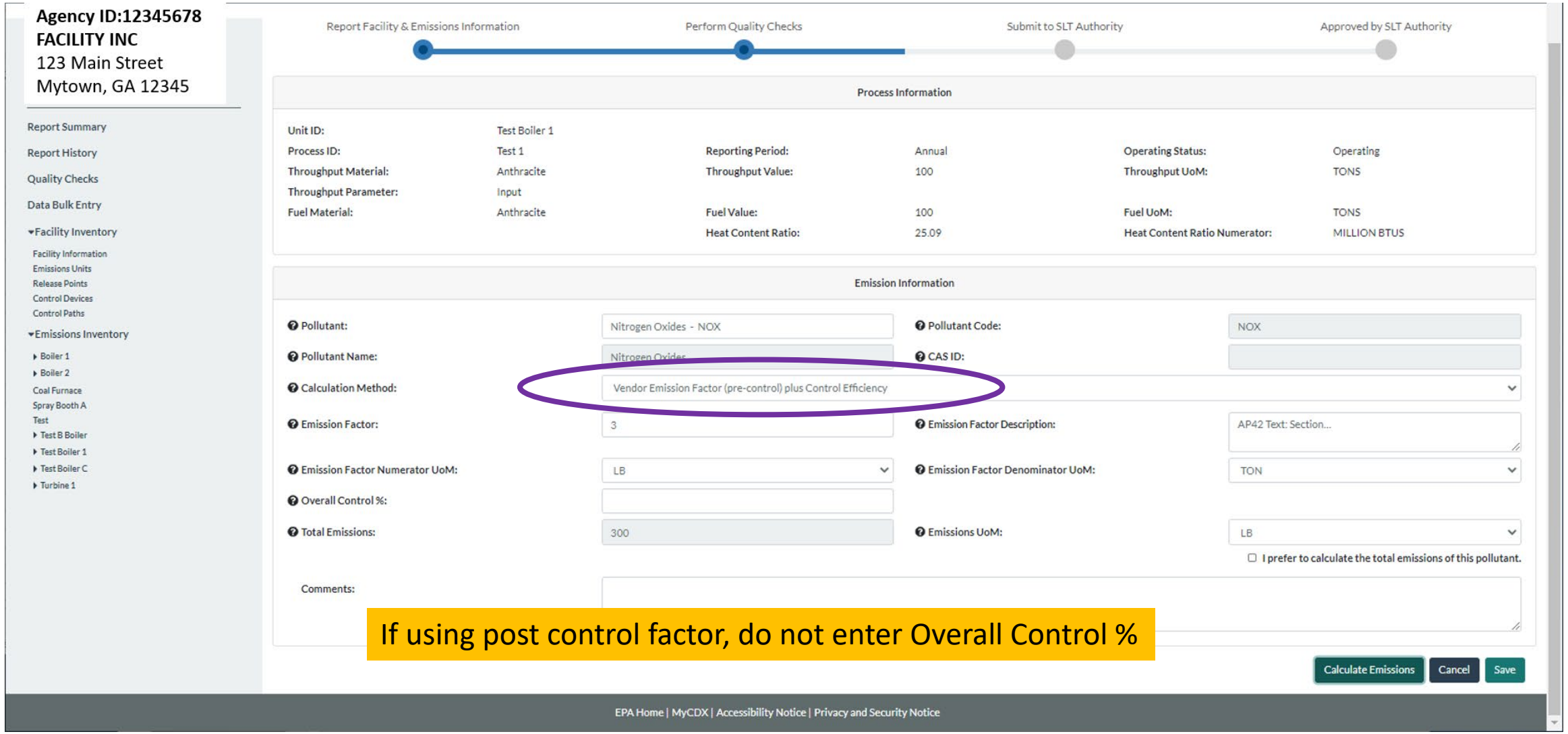


Option 1: Use Pre-Control Emission Factor



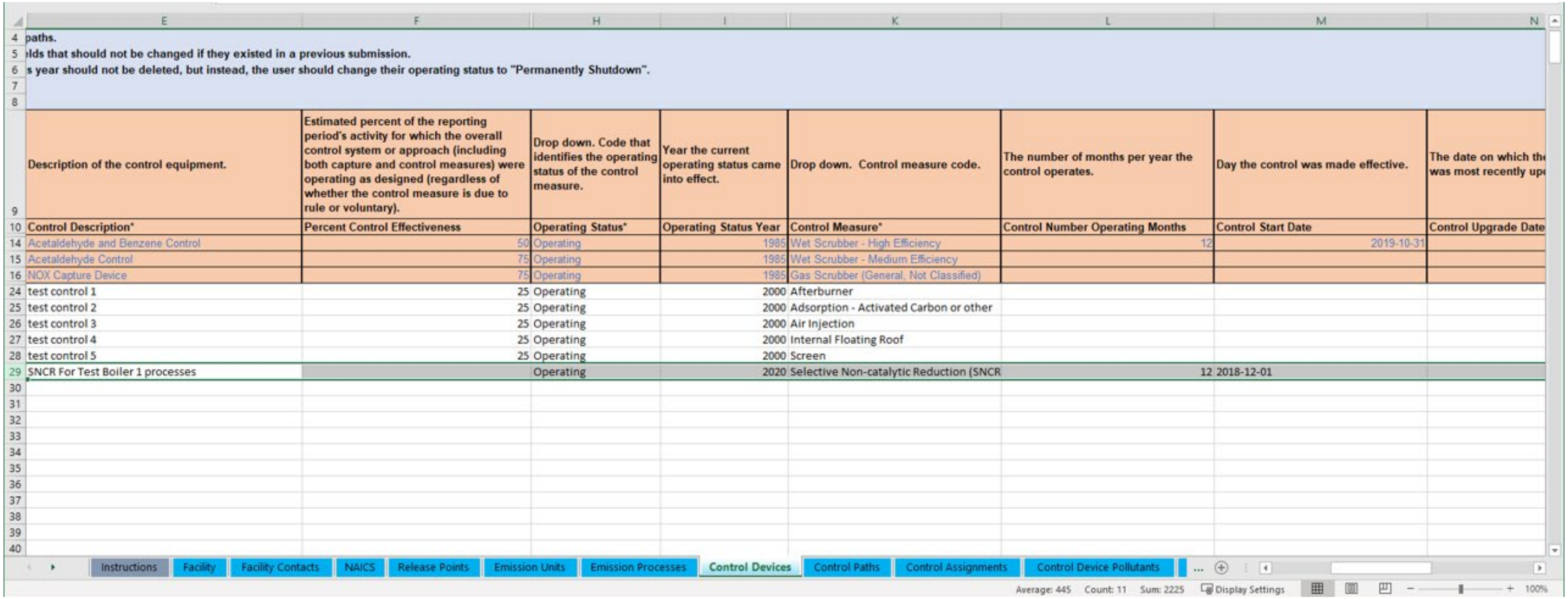
You must add control equipment to use the overall control %

Option 2: Can Use Post-Control Emission Factor



Control Device in Bulk Upload

Enter Data in Control Devices Tab



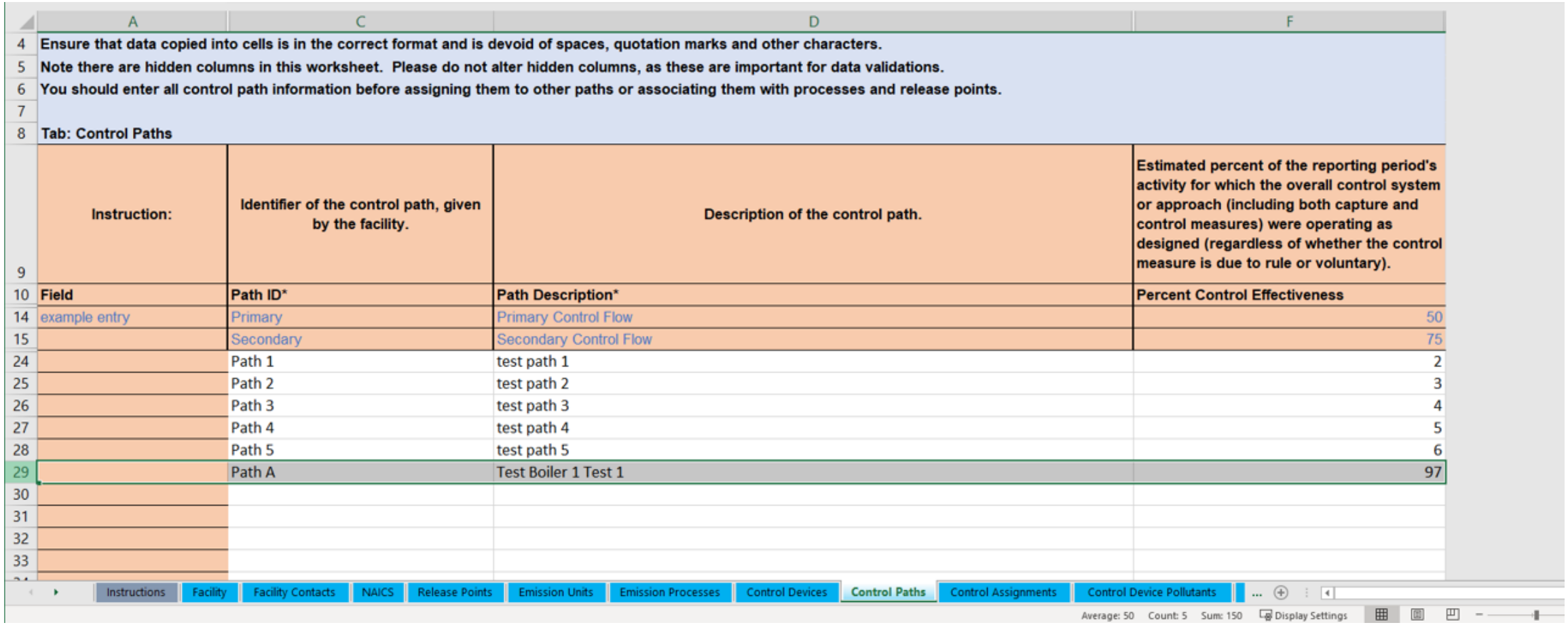
paths.
lds that should not be changed if they existed in a previous submission.
s year should not be deleted, but instead, the user should change their operating status to "Permanently Shutdown".

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 th was most recently up
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

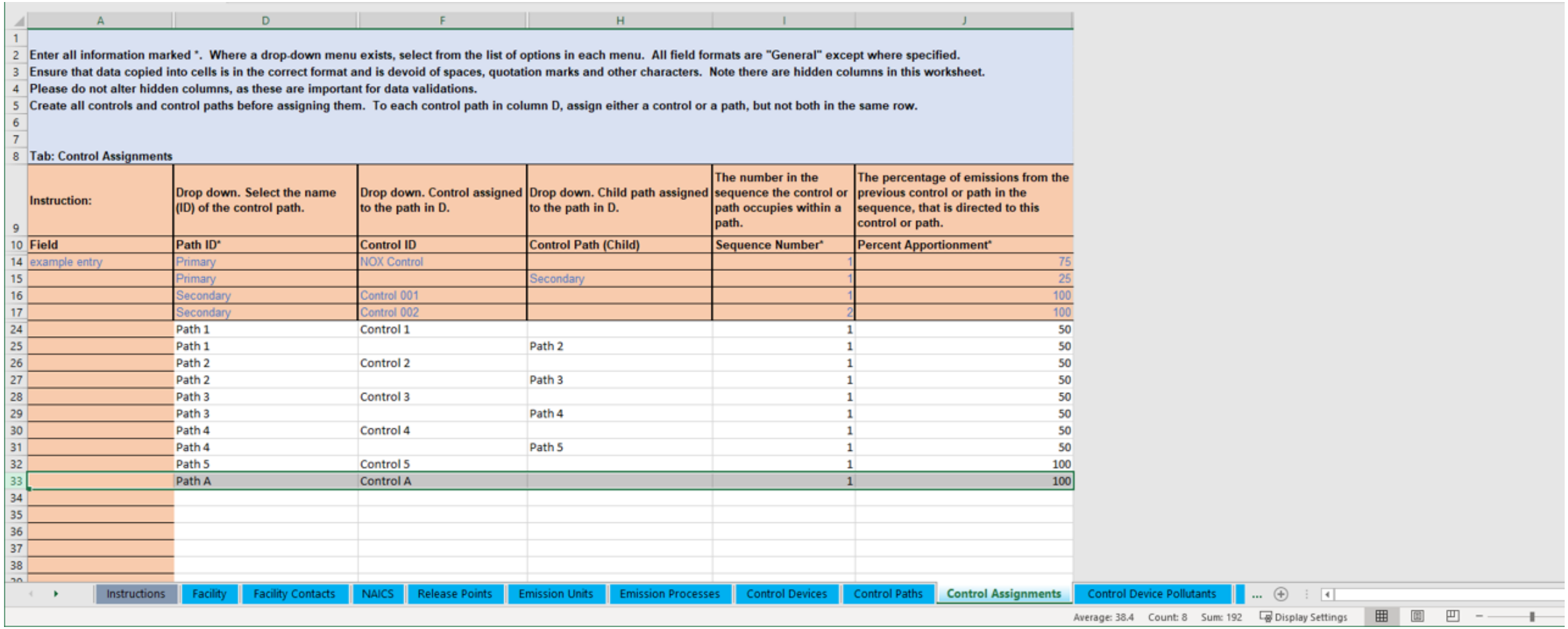
Average: 445 Count: 11 Sum: 2225 Display Settings 100%

Enter Data in the Control Paths Tab



	A	C	D	F
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	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).
10	Field	Path ID*	Path Description*	Percent Control Effectiveness
14	example entry	Primary	Primary Control Flow	50
15		Secondary	Secondary Control Flow	75
24		Path 1	test path 1	2
25		Path 2	test path 2	3
26		Path 3	test path 3	4
27		Path 4	test path 4	5
28		Path 5	test path 5	6
29		Path A	Test Boiler 1 Test 1	97
30				
31				
32				
33				

Enter Data in the Control Assignments Tab



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 for data validations.
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.

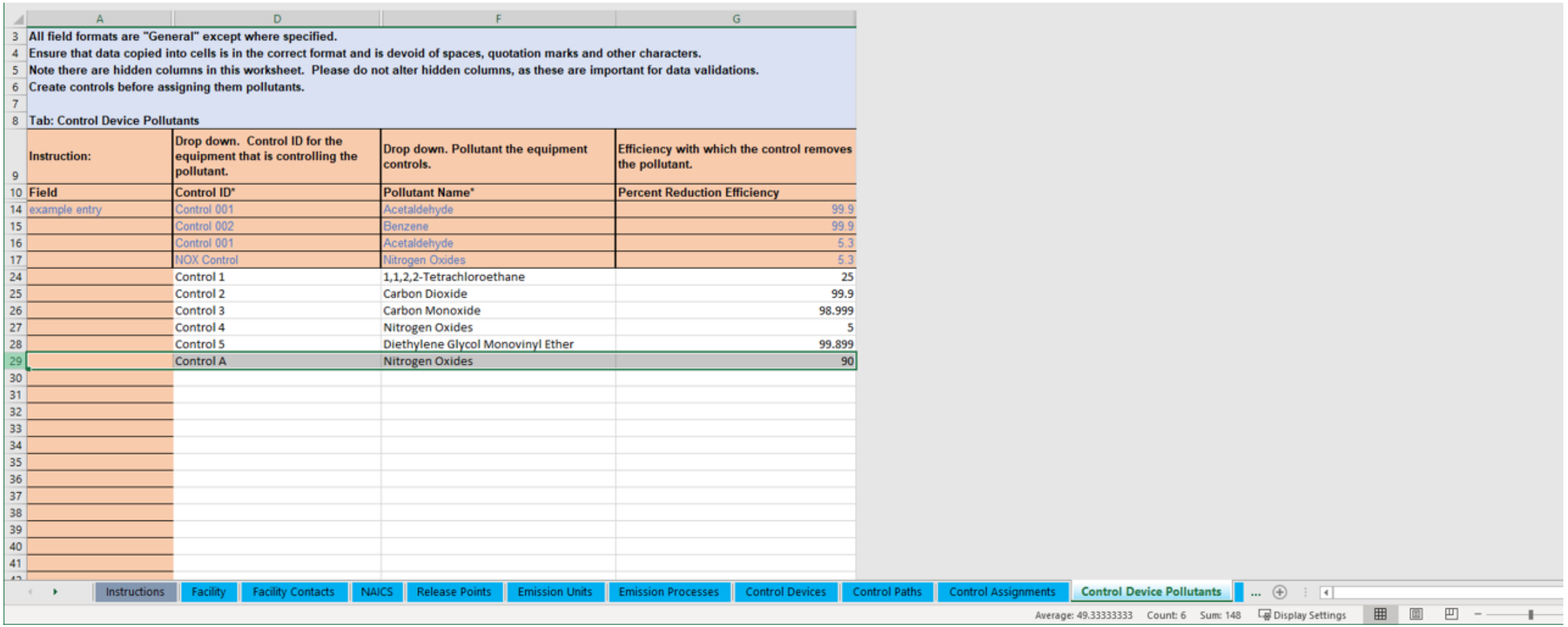
Tab: Control Assignments

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

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

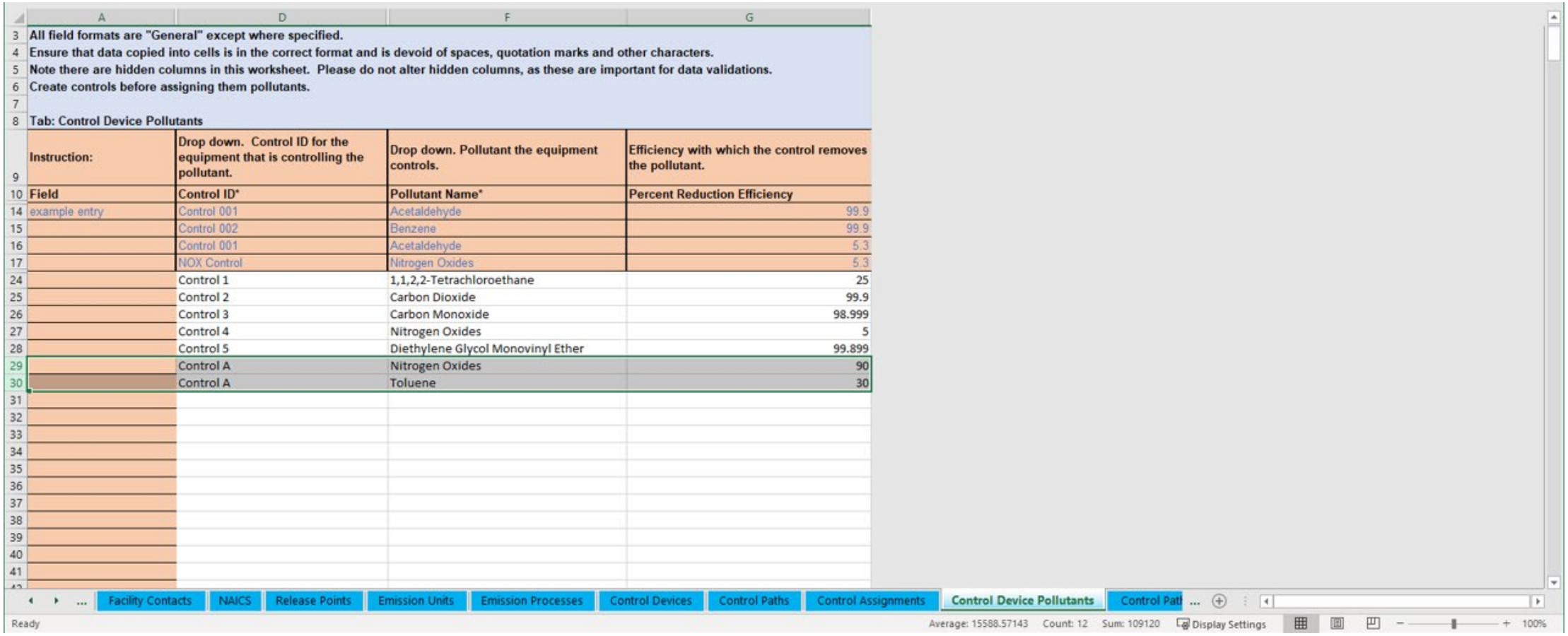


	A	D	F	G
3	All field formats are "General" except where specified.			
4	Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other characters.			
5	Note there are hidden columns in this worksheet. Please do not alter hidden columns, as these are important 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				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				

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

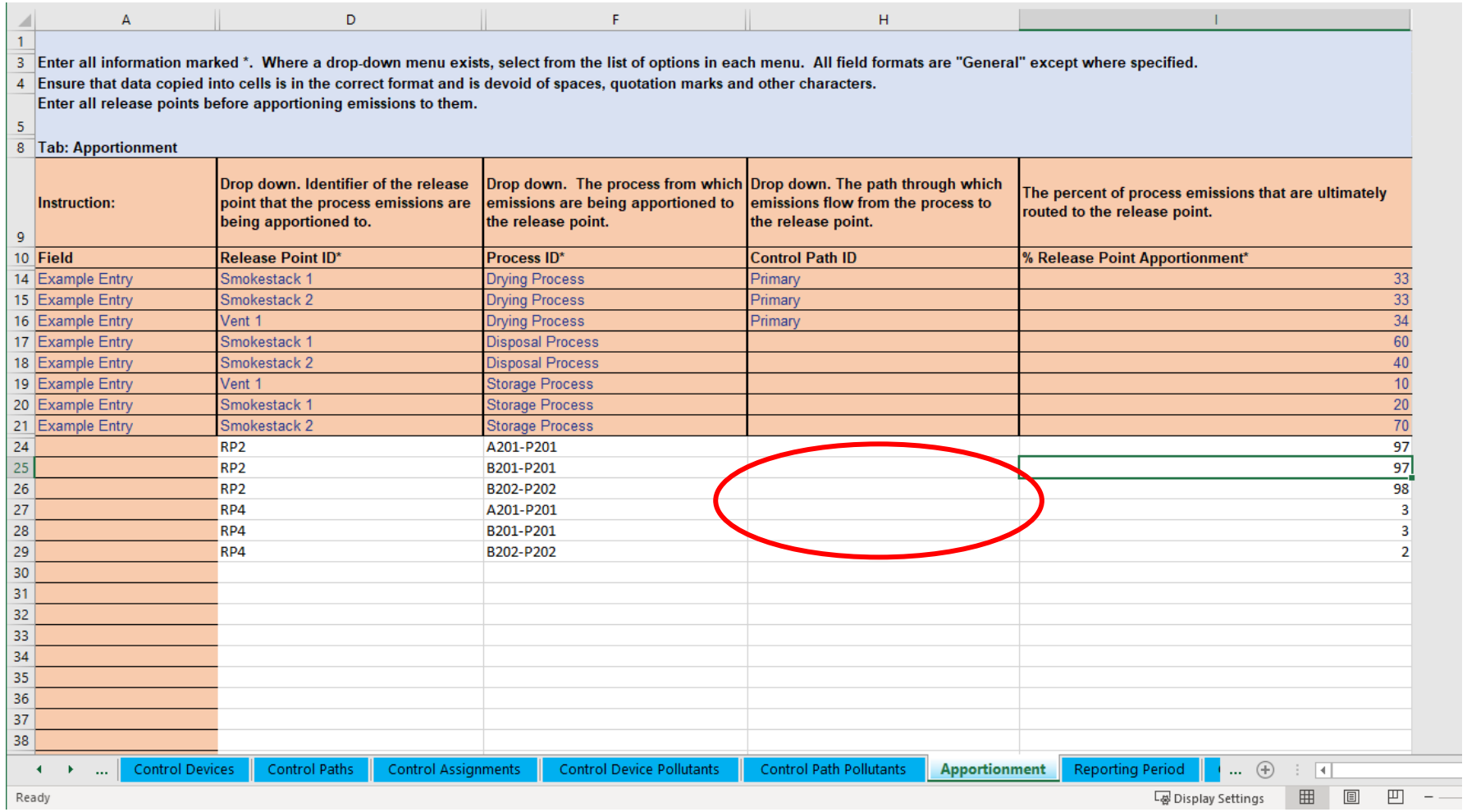
Average: 49.33333333 Count: 6 Sum: 148 Display Settings

Enter All Pollutants if More than One



	A	D	F	G
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				

Enter Data in the Apportionment Tab



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 release points before apportioning emissions to them.

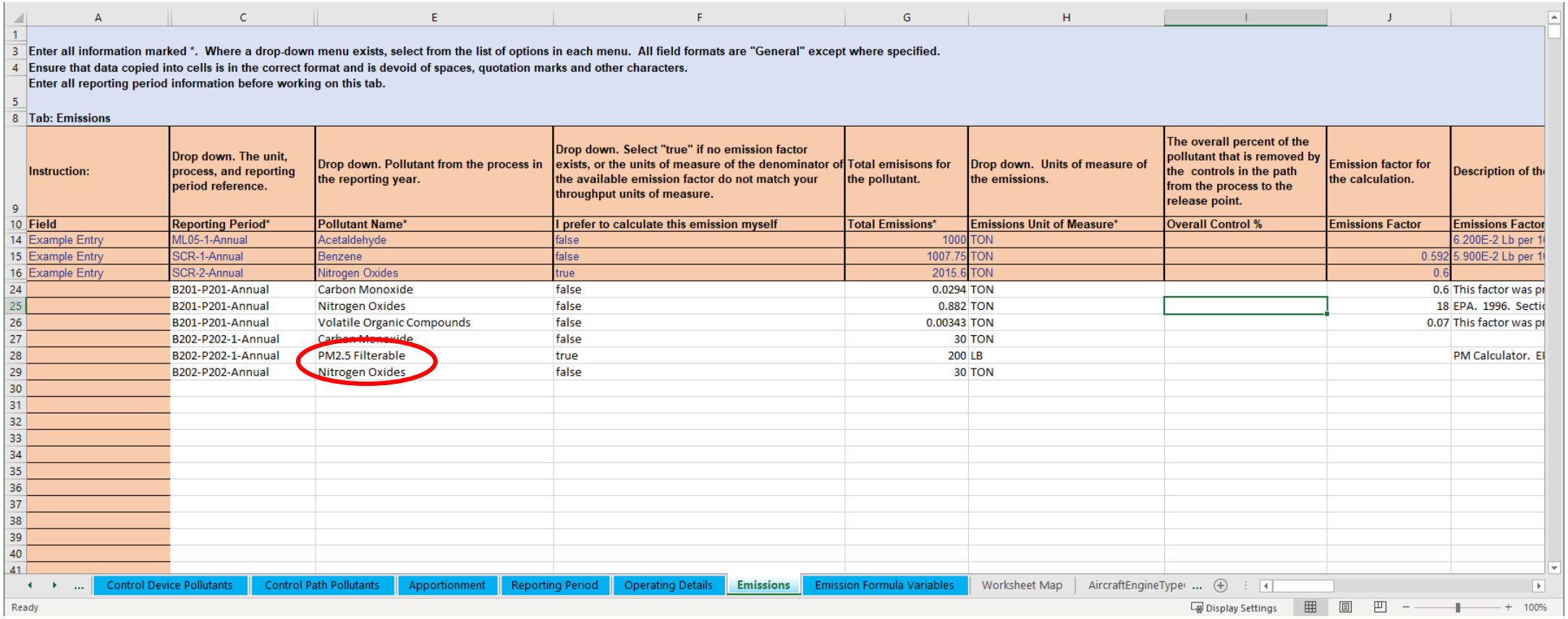
Tab: Apportionment

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
	RP2	A201-P201		97
	RP2	B201-P201		97
	RP2	B202-P202		98
	RP4	A201-P201		3
	RP4	B201-P201		3
	RP4	B202-P202		2

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

Ready

List Pollutants in Emissions Tab



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.

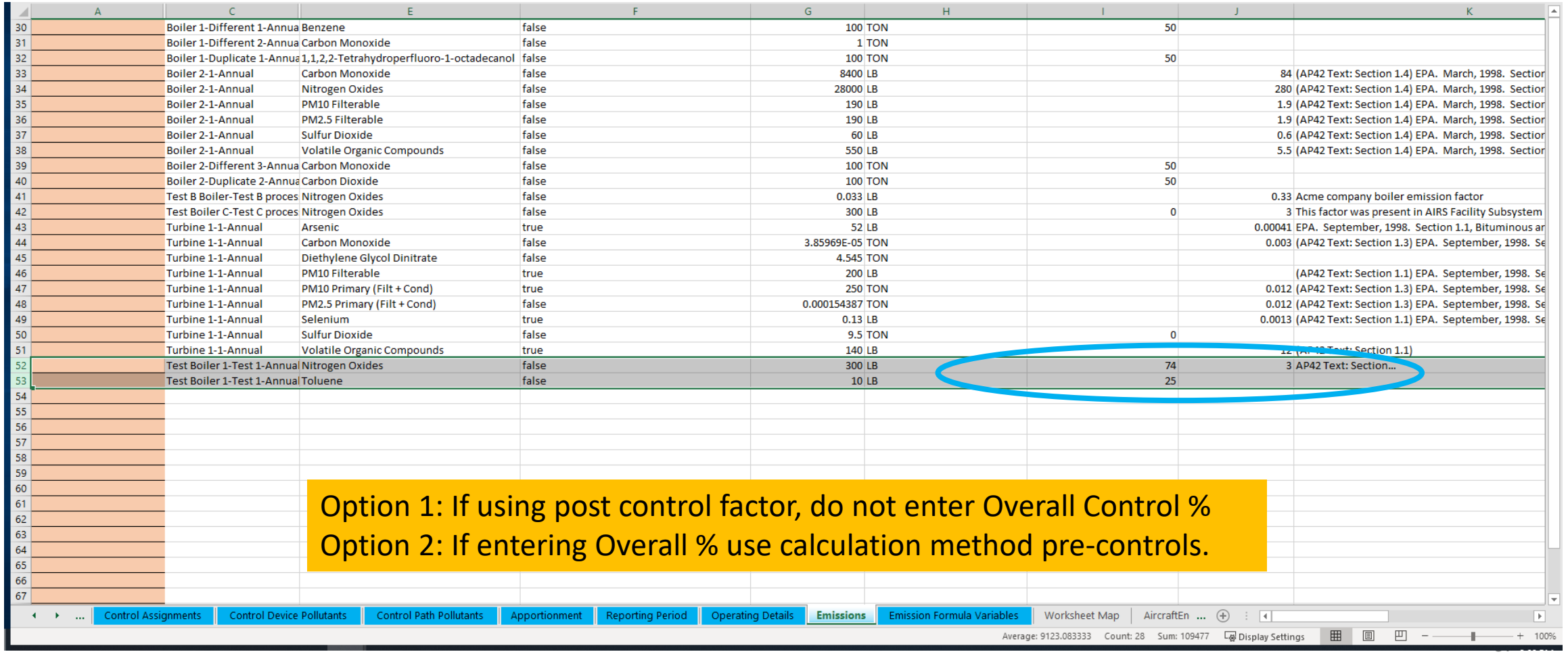
Tab: Emissions

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 emisisons 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 th
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			

Control Device Pollutants | Control Path Pollutants | Apportionment | Reporting Period | Operating Details | Emissions | Emission Formula Variables | Worksheet Map | AircraftEngineType

Ready

Option to List Overall in the Emissions Tab



	A	C	E	F	G	H	I	J	K
30		Boiler 1-Different 1-Annua	Benzene	false	100	TON	50		
31		Boiler 1-Different 2-Annua	Carbon Monoxide	false	1	TON			
32		Boiler 1-Duplicate 1-Annua	1,1,2,2-Tetrahydroperfluoro-1-octadecanol	false	100	TON	50		
33		Boiler 2-1-Annual	Carbon Monoxide	false	8400	LB		84	(AP42 Text: Section 1.4) EPA. March, 1998. Sectior
34		Boiler 2-1-Annual	Nitrogen Oxides	false	28000	LB		280	(AP42 Text: Section 1.4) EPA. March, 1998. Sectior
35		Boiler 2-1-Annual	PM10 Filterable	false	190	LB		1.9	(AP42 Text: Section 1.4) EPA. March, 1998. Sectior
36		Boiler 2-1-Annual	PM2.5 Filterable	false	190	LB		1.9	(AP42 Text: Section 1.4) EPA. March, 1998. Sectior
37		Boiler 2-1-Annual	Sulfur Dioxide	false	60	LB		0.6	(AP42 Text: Section 1.4) EPA. March, 1998. Sectior
38		Boiler 2-1-Annual	Volatile Organic Compounds	false	550	LB		5.5	(AP42 Text: Section 1.4) EPA. March, 1998. Sectior
39		Boiler 2-Different 3-Annua	Carbon Monoxide	false	100	TON	50		
40		Boiler 2-Duplicate 2-Annua	Carbon Dioxide	false	100	TON	50		
41		Test B Boiler-Test B proces	Nitrogen Oxides	false	0.033	LB		0.33	Acme company boiler emission factor
42		Test Boiler C-Test C proces	Nitrogen Oxides	false	300	LB	0	3	This factor was present in AIRS Facility Subsystem
43		Turbine 1-1-Annual	Arsenic	true	52	LB		0.00041	EPA. September, 1998. Section 1.1, Bituminous ar
44		Turbine 1-1-Annual	Carbon Monoxide	false	3.85969E-05	TON		0.003	(AP42 Text: Section 1.3) EPA. September, 1998. Se
45		Turbine 1-1-Annual	Diethylene Glycol Dinitrate	false	4.545	TON			
46		Turbine 1-1-Annual	PM10 Filterable	true	200	LB			(AP42 Text: Section 1.1) EPA. September, 1998. Se
47		Turbine 1-1-Annual	PM10 Primary (Filt + Cond)	true	250	TON		0.012	(AP42 Text: Section 1.3) EPA. September, 1998. Se
48		Turbine 1-1-Annual	PM2.5 Primary (Filt + Cond)	false	0.000154387	TON		0.012	(AP42 Text: Section 1.3) EPA. September, 1998. Se
49		Turbine 1-1-Annual	Selenium	true	0.13	LB		0.0013	(AP42 Text: Section 1.1) EPA. September, 1998. Se
50		Turbine 1-1-Annual	Sulfur Dioxide	false	9.5	TON	0		
51		Turbine 1-1-Annual	Volatile Organic Compounds	true	140	LB		12	(AP42 Text: Section 1.1)
52		Test Boiler 1-Test 1-Annual	Nitrogen Oxides	false	300	LB	74	3	AP42 Text: Section...
53		Test Boiler 1-Test 1-Annual	Toluene	false	10	LB	25		
54									
55									
56									
57									
58									
59									
60									
61									
62									
63									
64									
65									
66									
67									

Option 1: If using post control factor, do not enter Overall Control %
Option 2: If entering Overall % use calculation method pre-controls.

Control Assignments | Control Device Pollutants | Control Path Pollutants | Apportionment | Reporting Period | Operating Details | Emissions | Emission Formula Variables | Worksheet Map | AircraftEn ...

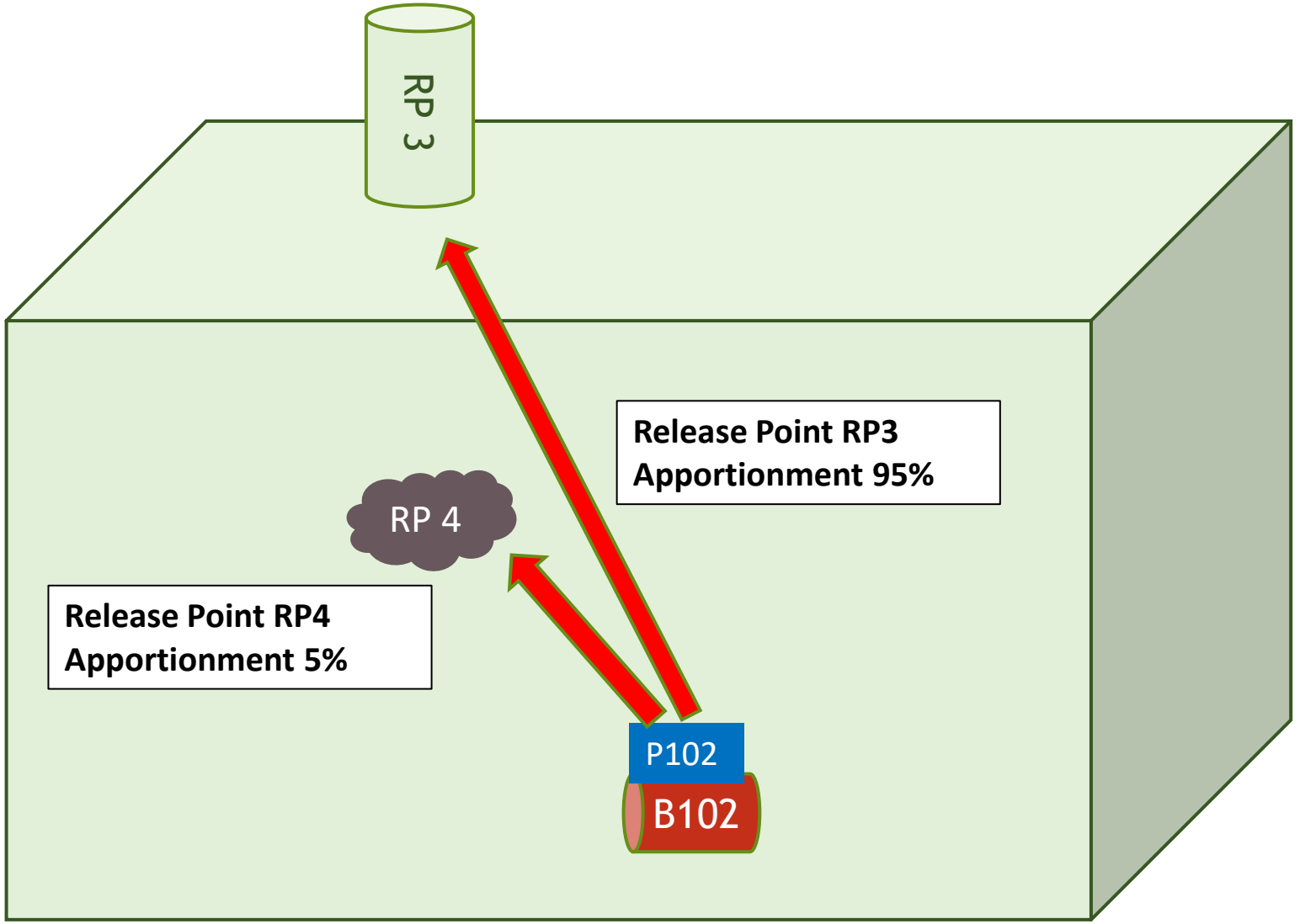
Average: 9123.083333 Count: 28 Sum: 109477 Display Settings 100%

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.

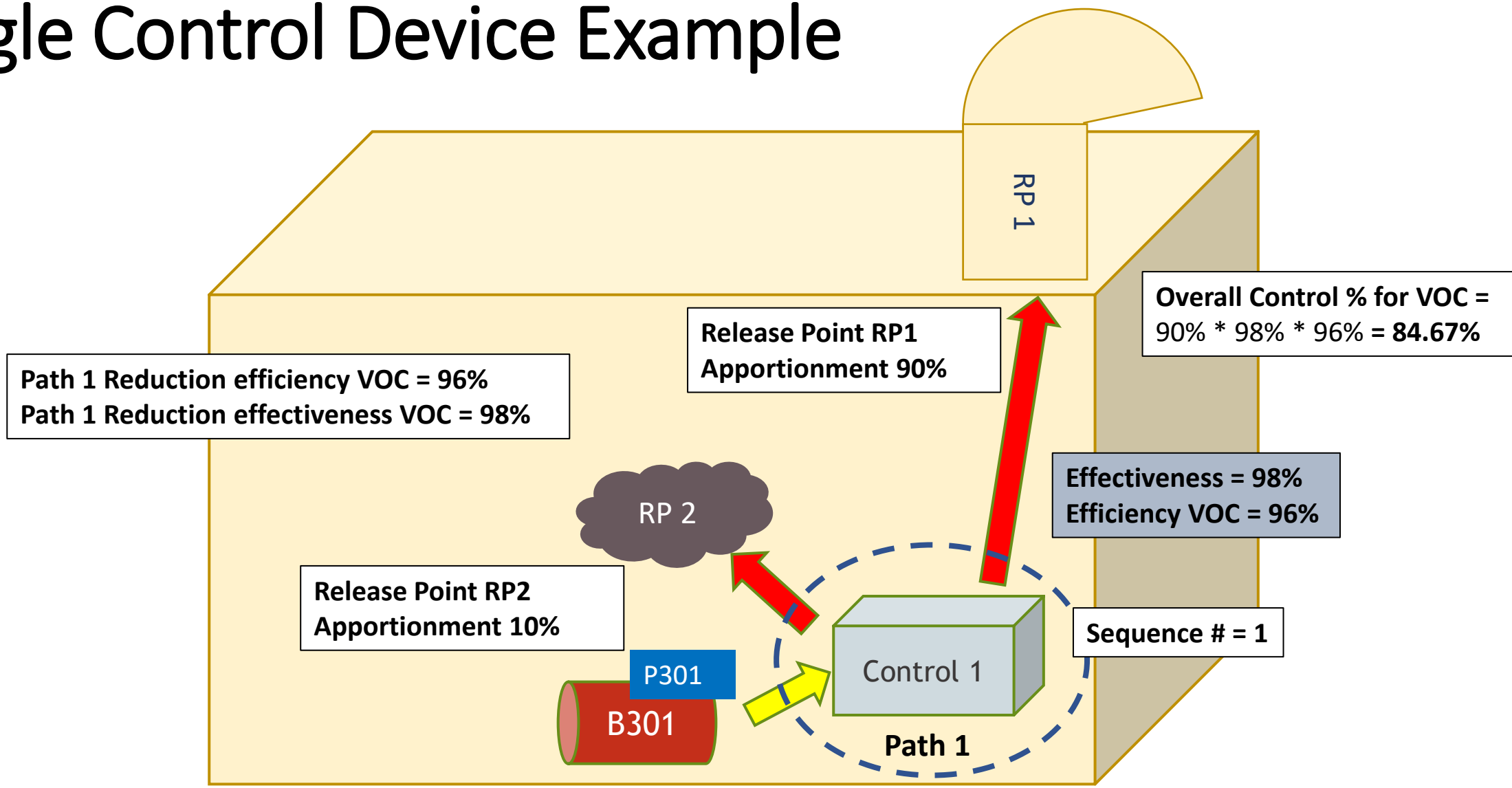
Examples for Different Configurations

No Control Device Example



Indicates a Release Point Apportionment

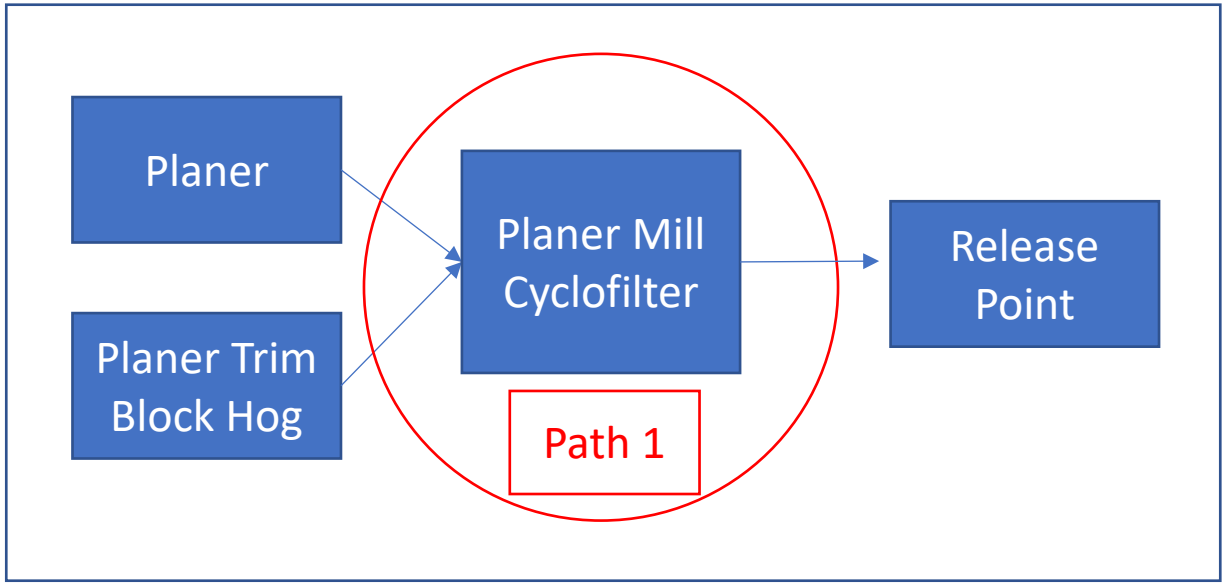
Single Control Device Example



Indicates a Release Point Apportionment

Indicates a Control Apportionment

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%

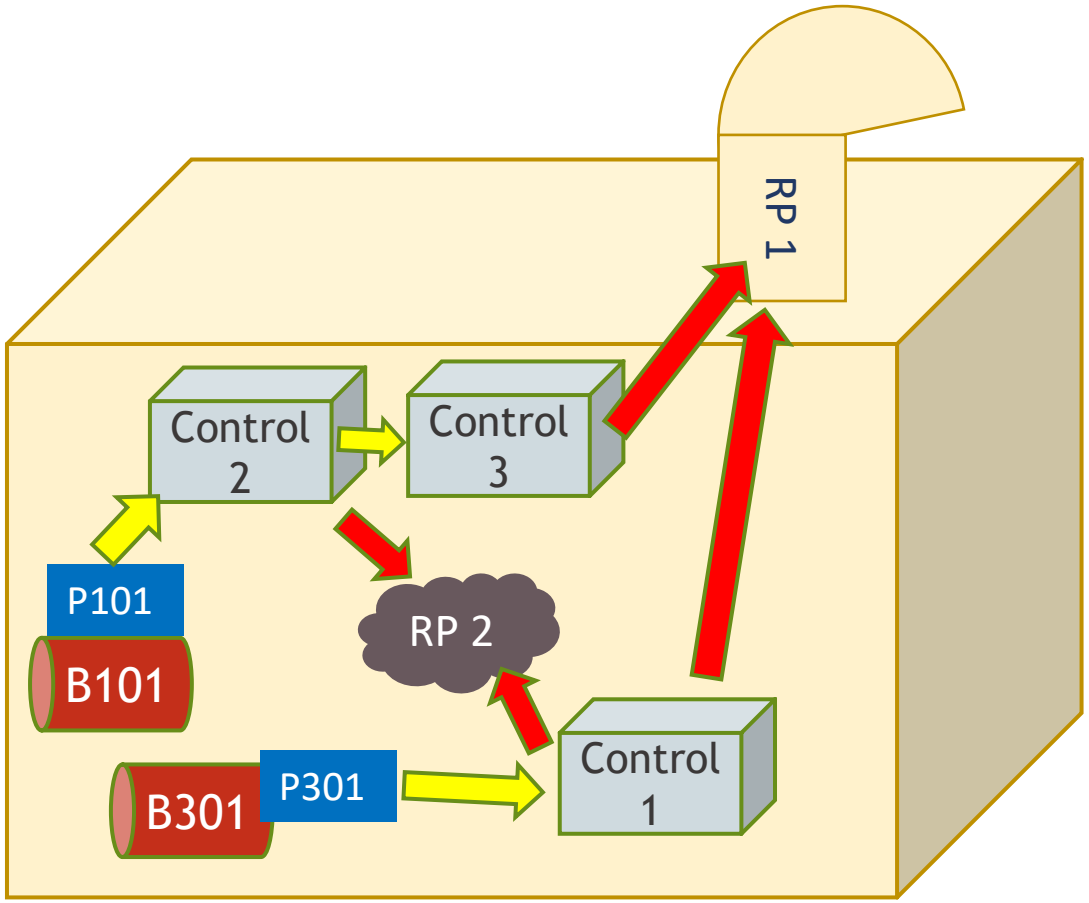
Pause for Single Control Device Q&A

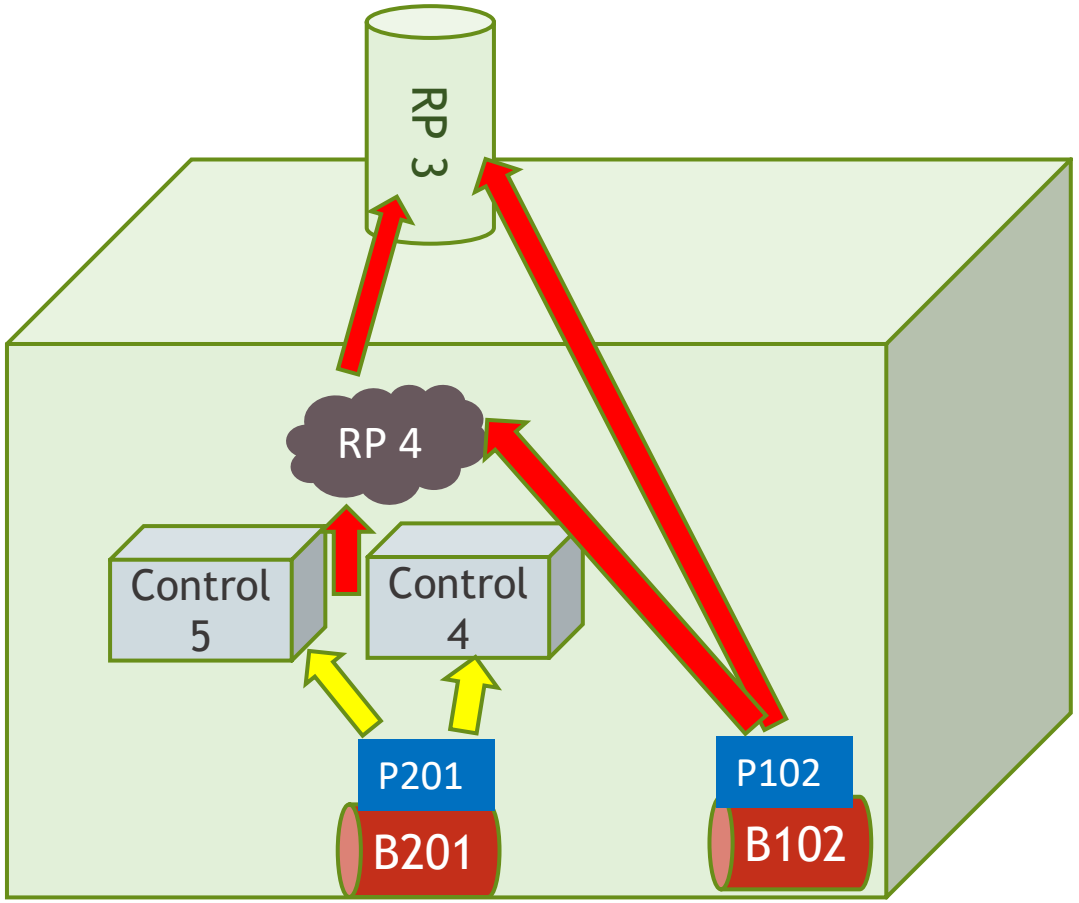
If you only have one control device or single control device configurations in your facility, this concludes your training.

You are welcome to stay, and/or 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 Facility with Many Configurations

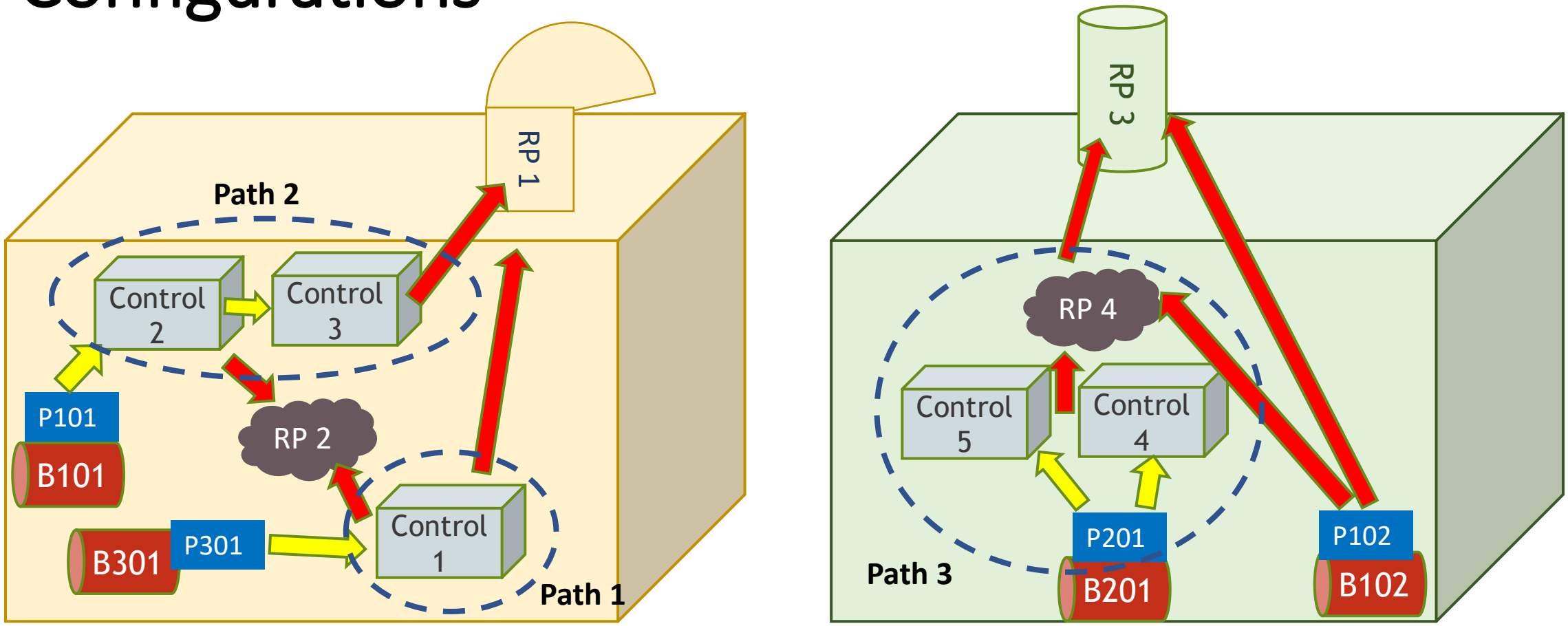




Indicates a Release Point Apportionment

Indicates a Control Apportionment

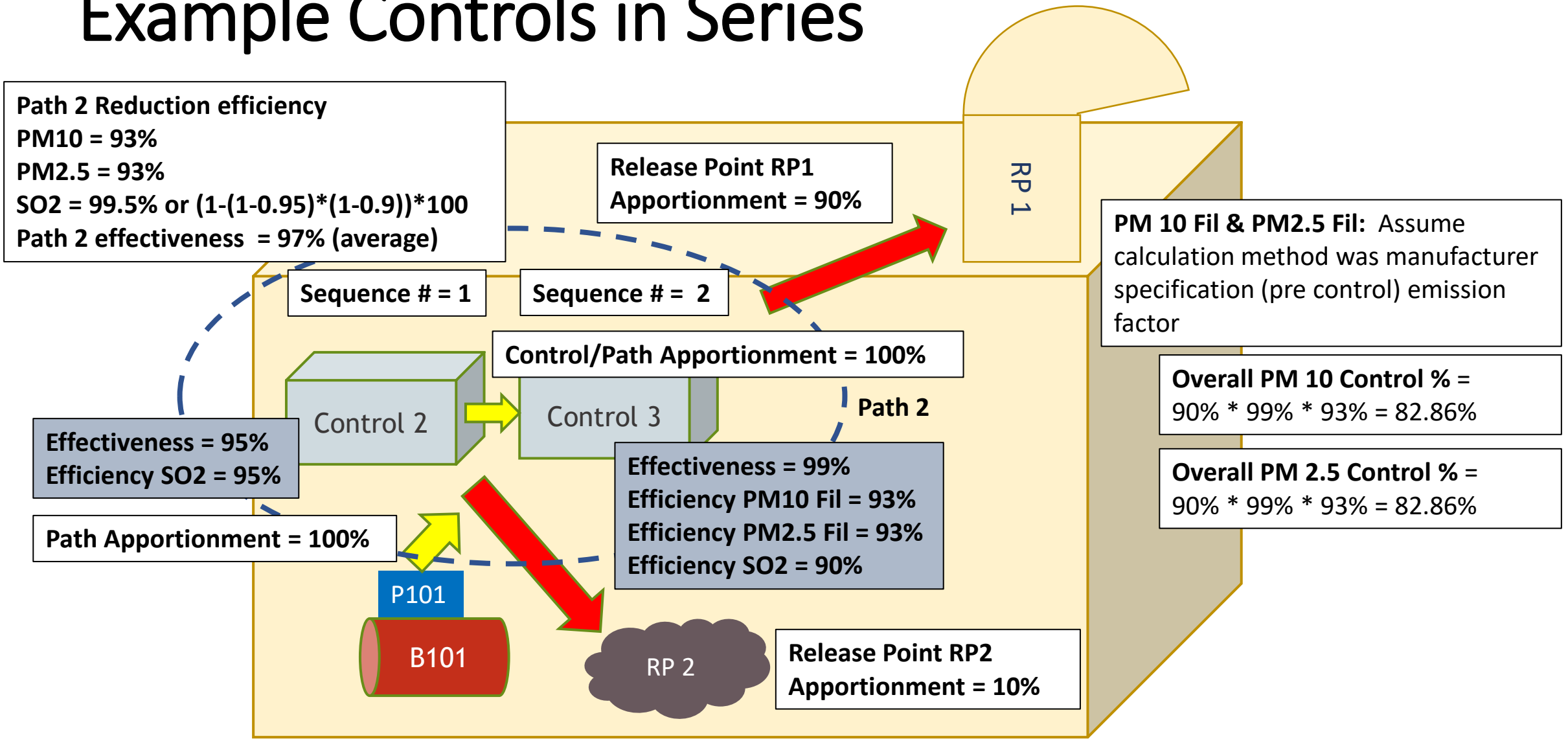
Example of Paths for a Facility with Many Configurations



Indicates a Release Point Apportionment

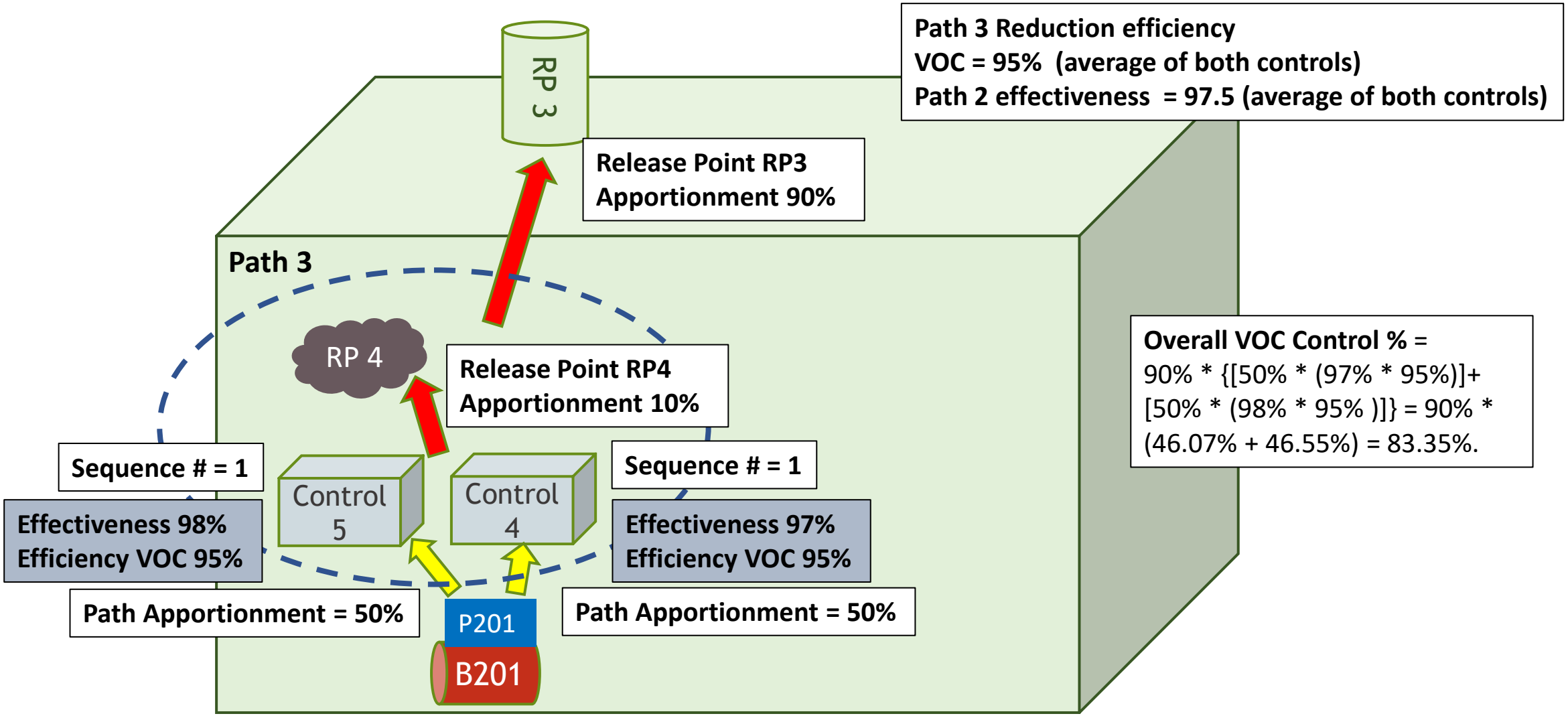
Indicates a Control Apportionment

Example Controls in Series



SO2: Assume calculation method was pre-control plus control efficiency, then must *assuming presence of both controls.*

Example Controls in Parallel



Overall Pollutant Control % for Multiple Controls

For more than one control for the *same* pollutant, then your overall control % may be:

- **In series for same pollutant:** capture % * average effectiveness * [1- ((1-control1 pollutant reduction efficiency)*(1-control2 pollutant reduction efficiency) *…)]
- **In parallel for same pollutant:** (overall controlled emissions 1 + overall controlled emissions 2+…)
- **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
- Ensure you have used calculation methods that do not include controls (e.g. EPA factor no control device).

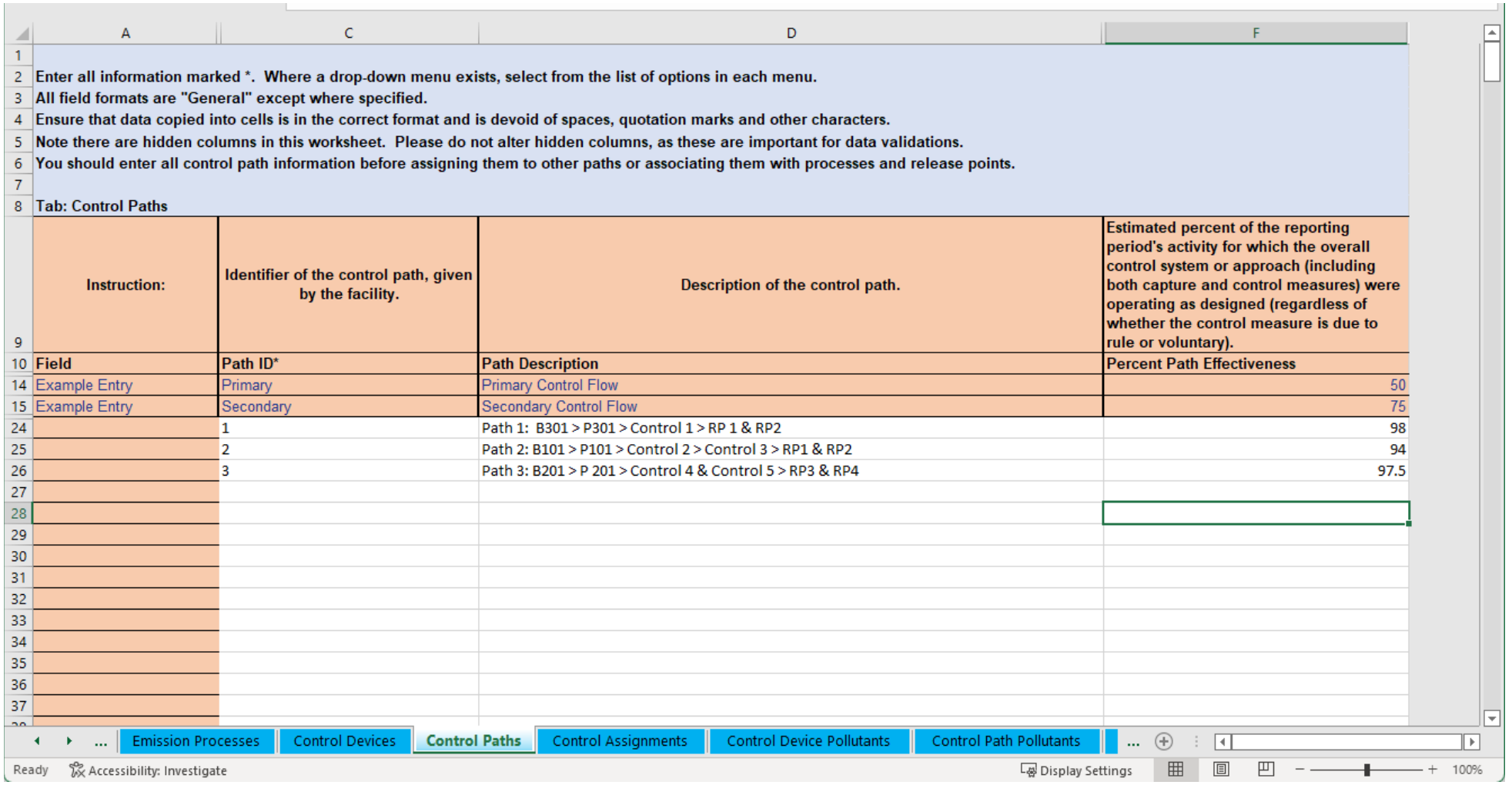
Control Device Tab for this Example

	A	C	E	F	H	I	K	
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							
9	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.
10	Field	Control ID*	Control Description	Percent Control Effectiveness	Operating Status*	Operating Status Year	Control Measure*	Control Num
14	Example Entry	CNTL1	Acetaldehyde and Benzene Control	50	Operating	1985	Wet Scrubber - High Efficiency	
15	Example Entry	CNTL2	Acetaldehyde Control	75	Operating	1985	Wet Scrubber - Medium Efficiency	
16	Example Entry	CNTL3	NOX Capture Device	75	Operating	1985	Gas Scrubber (General, Not Classified)	
24		1	Single control in path.	98	Operating	2018	Catalytic Afterburner	
25		2	Control in a series.	95	Operating	2017	Dry Sorbent Injection (DSI, other than ACI)	
26		3	Control in a series.	99	Operating	2018	Wet Scrubber	
27		4	A control in parallel.	97	Operating	2017	Biofilter	
28		5	A control in parallel.	98	Operating	2018	Biofilter	
29								
30								
31								
32								
33								
34								
35								

... Emission Processes | Control Devices | Control Paths | Control Assignments | Control Device Pollutants | Control Path Pollutants | Apportionment | Reporting Period | Operating De ...

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

Control Paths Tab for this Example

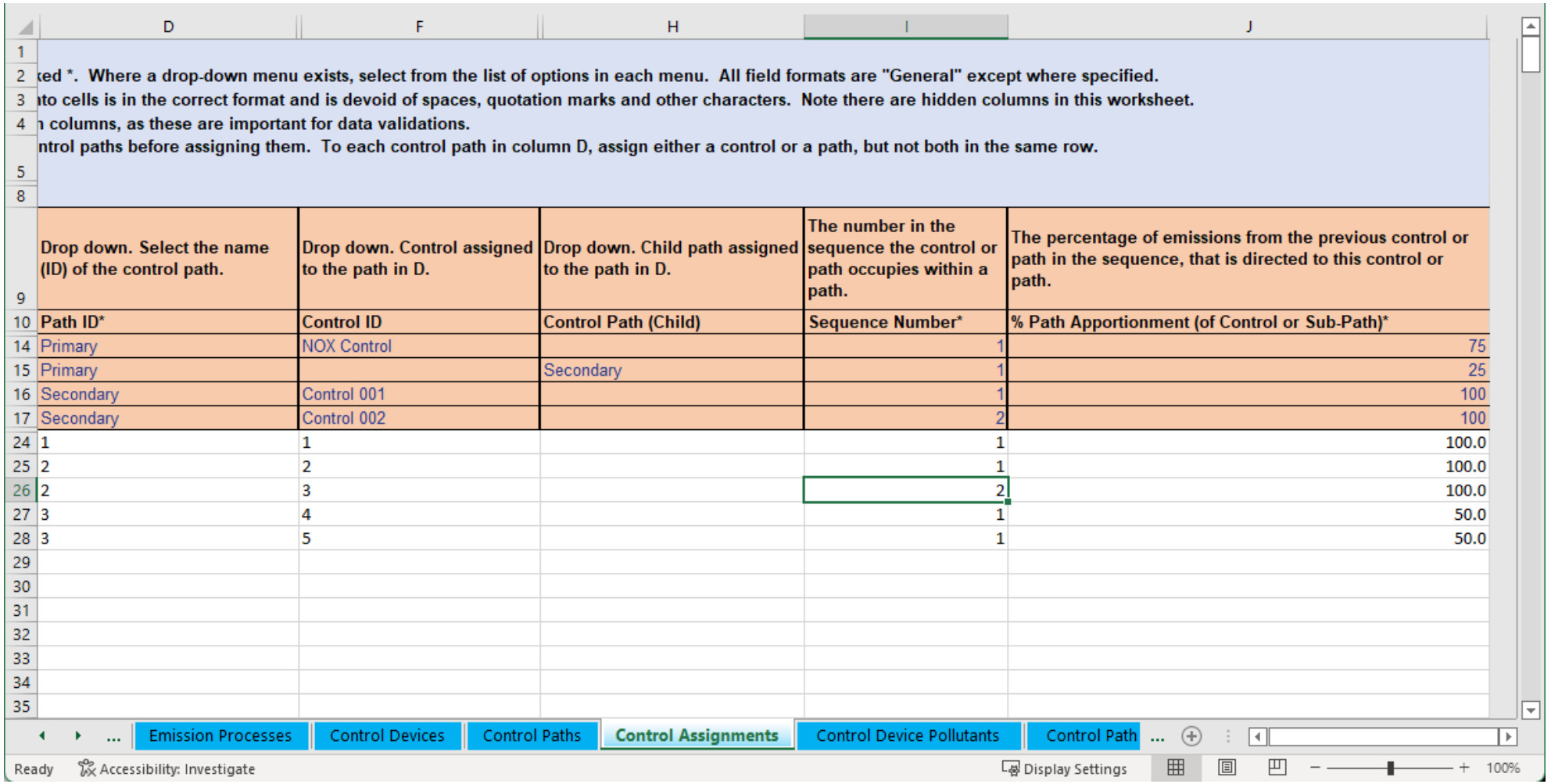


	A	C	D	F
1				
2	Enter all information marked *. Where a drop-down menu exists, select from the list of options in each menu.			
3	All field formats are "General" except where specified.			
4	Ensure that data copied into cells is in the correct format and is devoid of spaces, quotation marks and other 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			
9	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).
10	Field	Path ID*	Path Description	Percent Path Effectiveness
14	Example Entry	Primary	Primary Control Flow	50
15	Example Entry	Secondary	Secondary Control Flow	75
24		1	Path 1: B301 > P301 > Control 1 > RP 1 & RP2	98
25		2	Path 2: B101 > P101 > Control 2 > Control 3 > RP1 & RP2	94
26		3	Path 3: B201 > P 201 > Control 4 & Control 5 > RP3 & RP4	97.5
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				

Emission Processes | Control Devices | Control Paths | Control Assignments | Control Device Pollutants | Control Path Pollutants

Ready | Accessibility: Investigate | Display Settings | 100%

Control Assignments for this Example

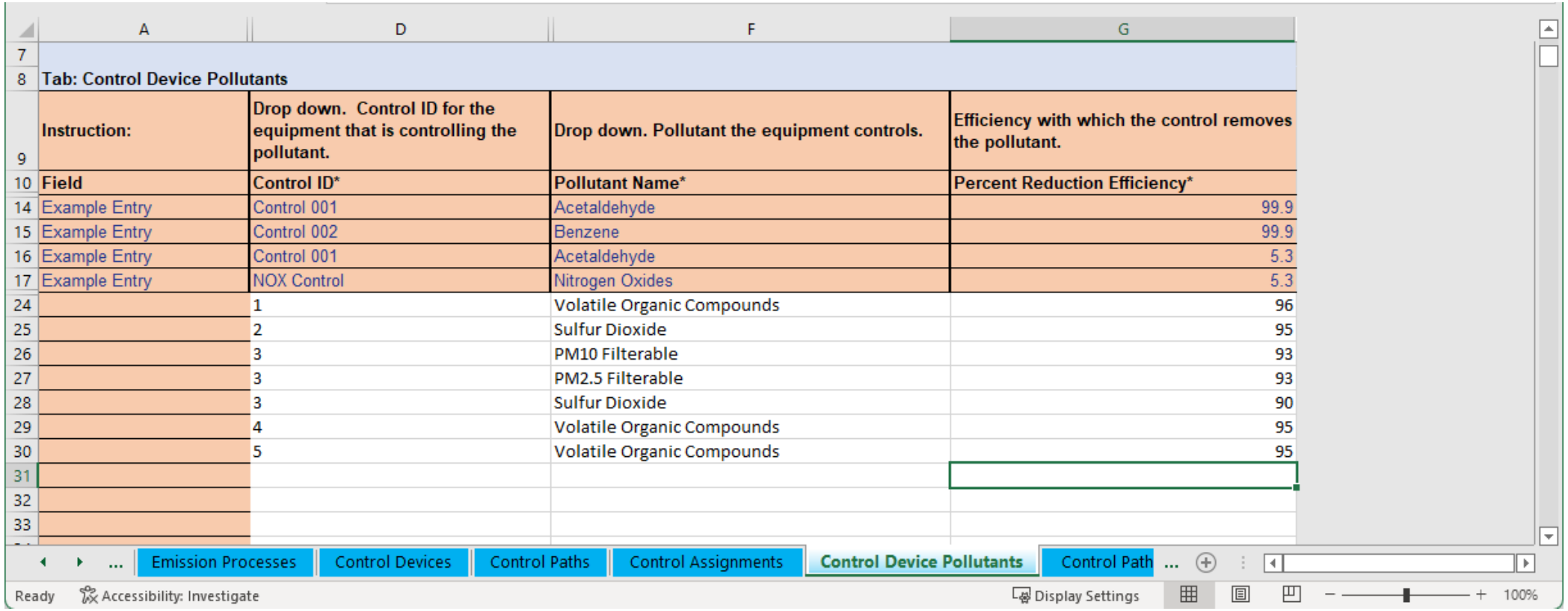


	D	F	H	I	J
1					
2	ked *. Where a drop-down menu exists, select from the list of options in each menu. All field formats are "General" except where specified.				
3	nto cells is in the correct format and is devoid of spaces, quotation marks and other characters. Note there are hidden columns in this worksheet.				
4	n columns, as these are important for data validations.				
5	ntrol 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					

Emission Processes | Control Devices | Control Paths | Control Assignments | Control Device Pollutants | Control Path

Ready | Accessibility: Investigate | Display Settings | 100%

Control Device Pollutants for this Example

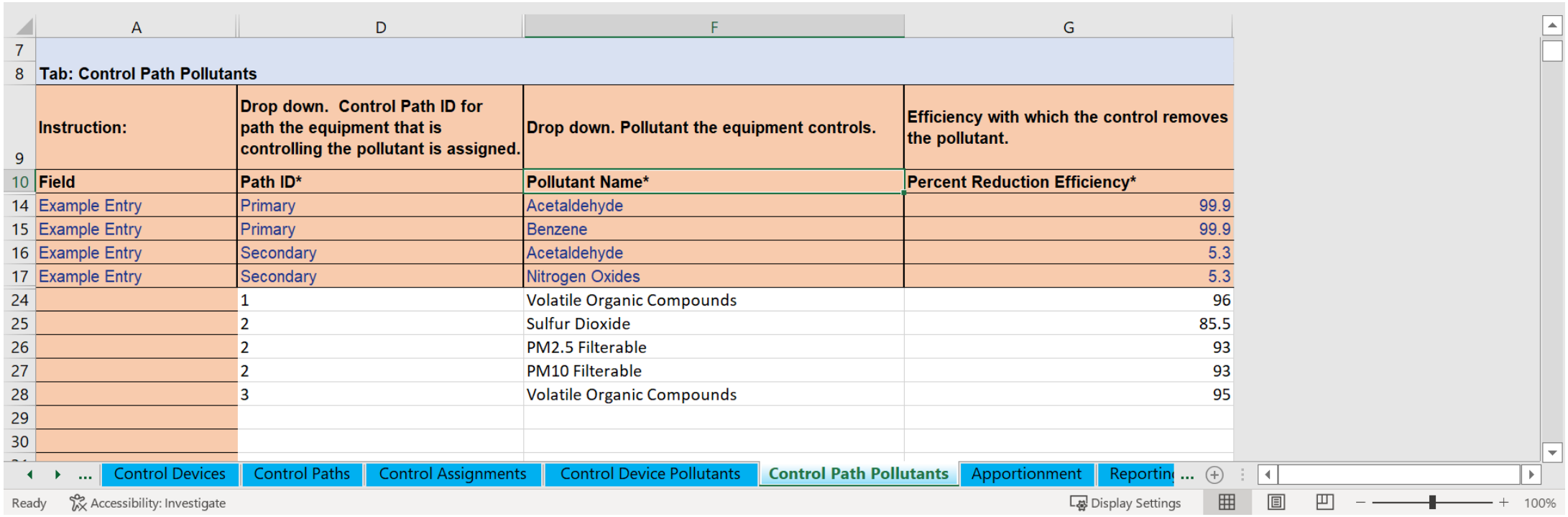


	A	D	F	G
7				
8	**Tab: Control Device Pollutants**			
9	**Instruction:**	**Drop down. Control ID for the equipment that is controlling the pollutant.**	**Drop down. Pollutant the equipment controls.**	**Efficiency with which the control removes the pollutant.**
10	**Field**	**Control ID***	**Pollutant 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		1	Volatile Organic Compounds	96
25		2	Sulfur Dioxide	95
26		3	PM10 Filterable	93
27		3	PM2.5 Filterable	93
28		3	Sulfur Dioxide	90
29		4	Volatile Organic Compounds	95
30		5	Volatile Organic Compounds	95
31				
32				
33				

Emission Processes | Control Devices | Control Paths | Control Assignments | Control Device Pollutants | Control Path ...

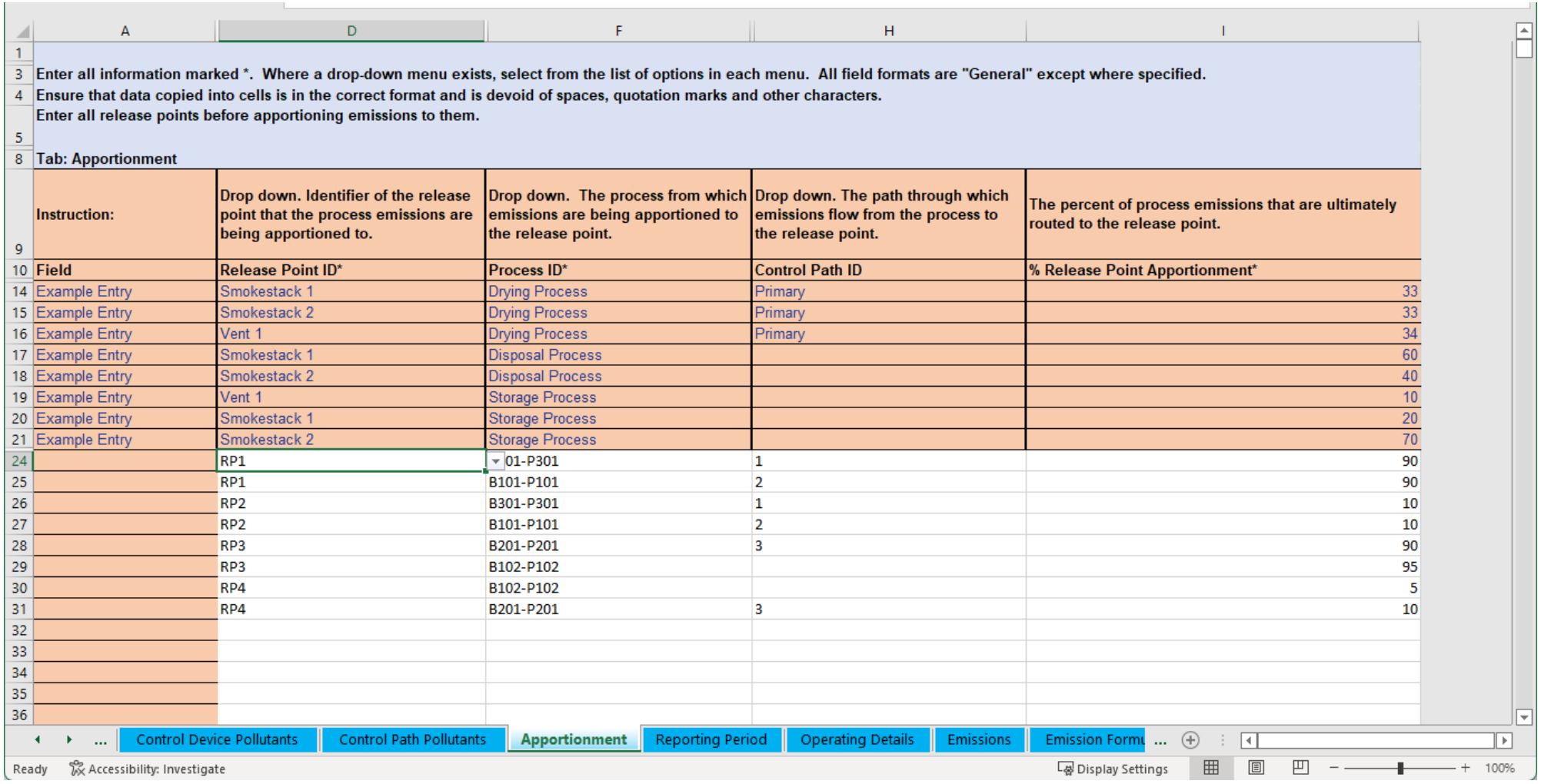
Ready | Accessibility: Investigate | Display Settings | 100%

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				

Release Point Apportionment for this Example



	A	D	F	H	I
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				
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		RP1	01-P301	1	90
25		RP1	B101-P101	2	90
26		RP2	B301-P301	1	10
27		RP2	B101-P101	2	10
28		RP3	B201-P201	3	90
29		RP3	B102-P102		95
30		RP4	B102-P102		5
31		RP4	B201-P201	3	10
32					
33					
34					
35					
36					

Control Device Pollutants | Control Path Pollutants | Apportionment | Reporting Period | Operating Details | Emissions | Emission Formu ...

Ready | Accessibility: Investigate | Display Settings | 100%

Emissions for this Example

	A	C	E	F	G	H	I	J	
8	Tab: Emissions								
9	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 emisisons 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 emi
10	Field	Reporting Period*	Pollutant Name*	I prefer to calculate this emission myself	Total Emissions*	Emissions Unit of Measure*	Overall Control %	Emissions Factor	Emissions Factor Desc
14	Example Entry	ML05-1-Annual	Acetaldehyde	false	1000	TON			6.200E-2 Lb per 1000 Sc
15	Example Entry	SCR-1-Annual	Benzene	false	1007.75	TON		0.592	5.900E-2 Lb per 1000 Sc
16	Example Entry	SCR-2-Annual	Nitrogen Oxides	true	2015.6	TON		0.6	
24		B101-P101-Annual	Nitrogen Oxides	false	195.0	LB		3	This factor was present
25		B101-P101-Annual	PM10 Filterable	false	22.282	LB	82.86	2	Acme Corporation User
26		B101-P101-Annual	PM2.5 Filterable	false	11.141	LB	82.86	1	Acme Corporation User
27		B101-P101-Annual	Sulfur Dioxide	false	195.0	LB		3	Approved by SLT on Ma
28		B101-P101-Annual	Volatile Organic Compounds	false	390.0	LB		6	CEMS Ratio
29		B102-P102-Annual	PM10 Filterable	false	6630.0	LB			EPA. October, 1996. Se
30		B102-P102-Annual	PM2.5 Filterable	false	3744.0	LB			PM Calculator. EPA. Ja
31		B201-P201-Annual	PM2.5 Primary (Filt + Cond)	false	200000.0	LB		5	SLT approved on 3/21/2
32		B201-P201-Annual	Sulfur Dioxide	false	4000.0	LB			
33		B201-P201-Annual	Volatile Organic Compounds	false	120000.0	LB		3	Tested on 03/2017.
34		B301-P301-Annual	Volatile Organic Compounds	false	54.945	LB	83.35	3	Information your SLT w
35									
36									
37									
38									
39									
40									

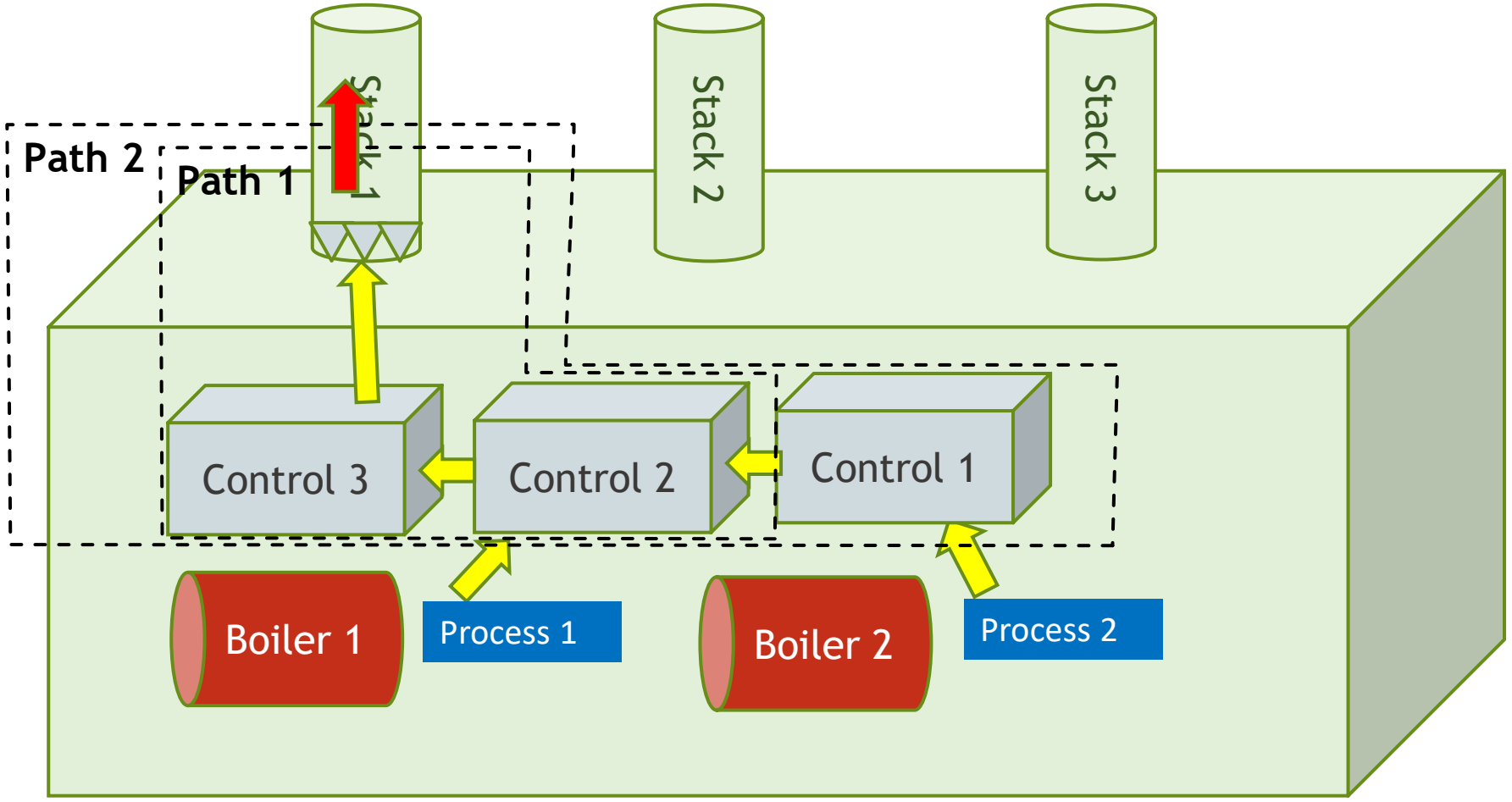
Period | Operating Details | Emissions | Emission Formula Variables | Worksheet Map | AircraftEngineTypeCode | CalculationMaterialCode | CalculationMethodCode | CalculationParameterTypeC ...

Ready | Accessibility: Investigate | Display Settings | 100%

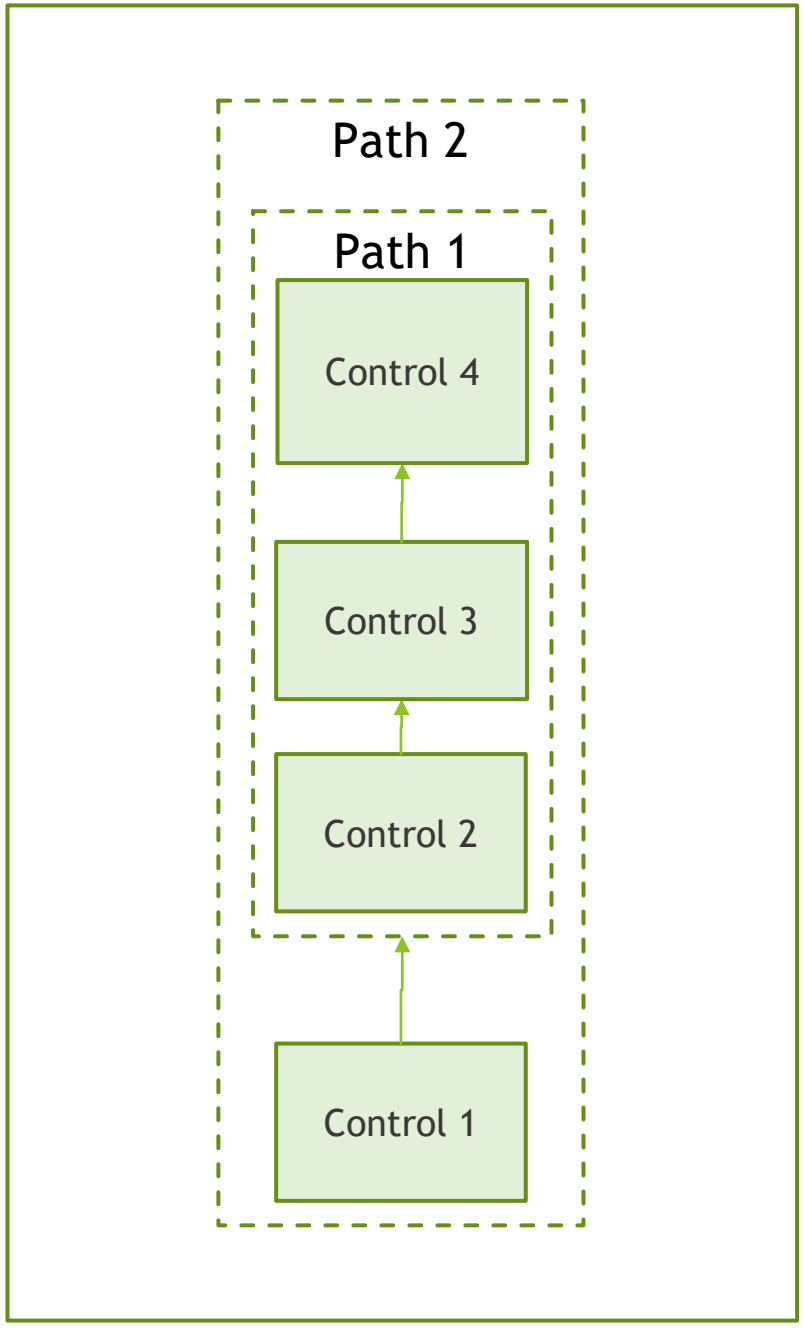
Examples of More Complex Control Device Configurations

In Series

Control 4



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%

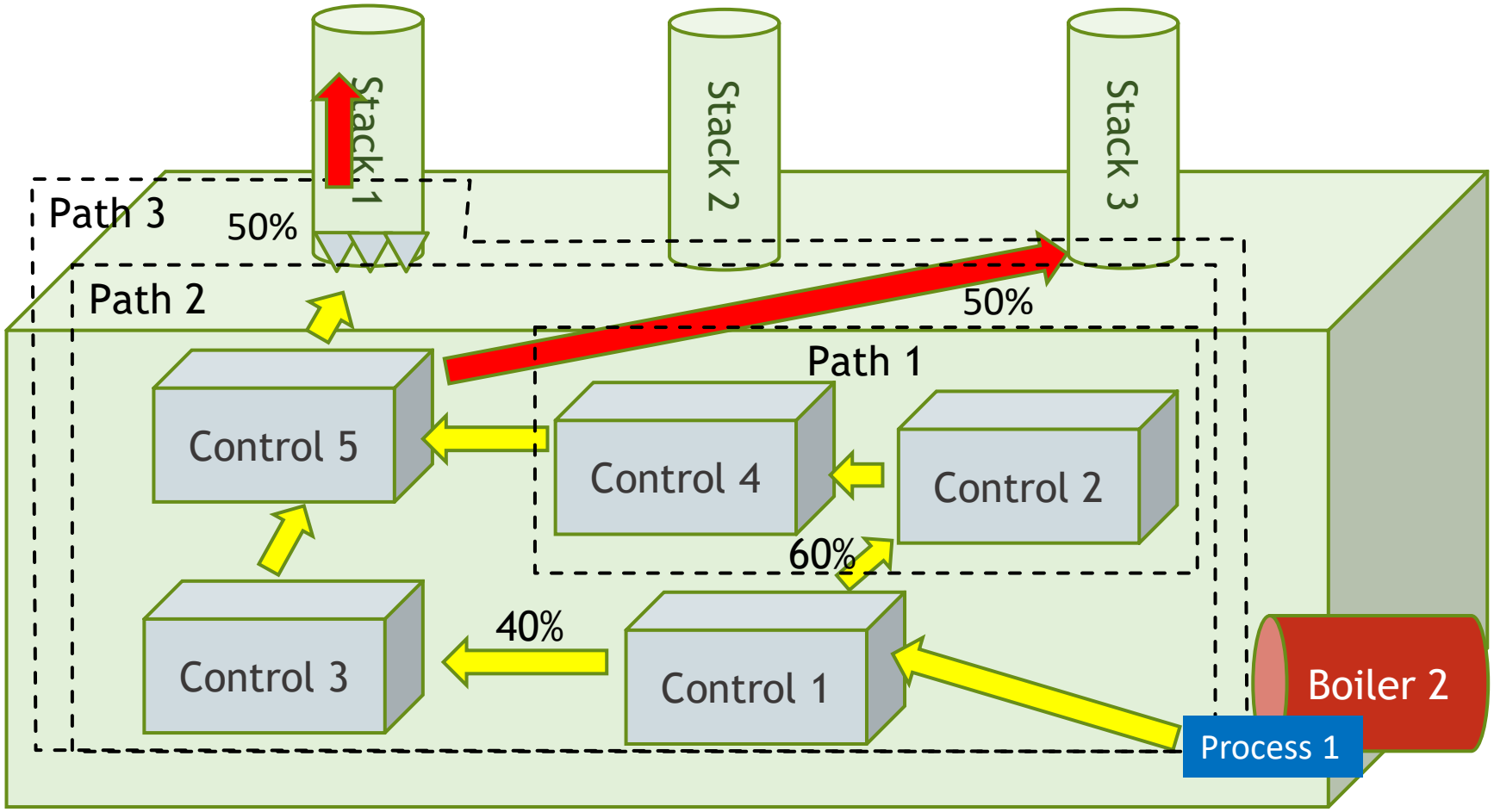
In this example we assume 100% of emissions are routed to the release point (% capture = 100%, no fugitives).

Release Points

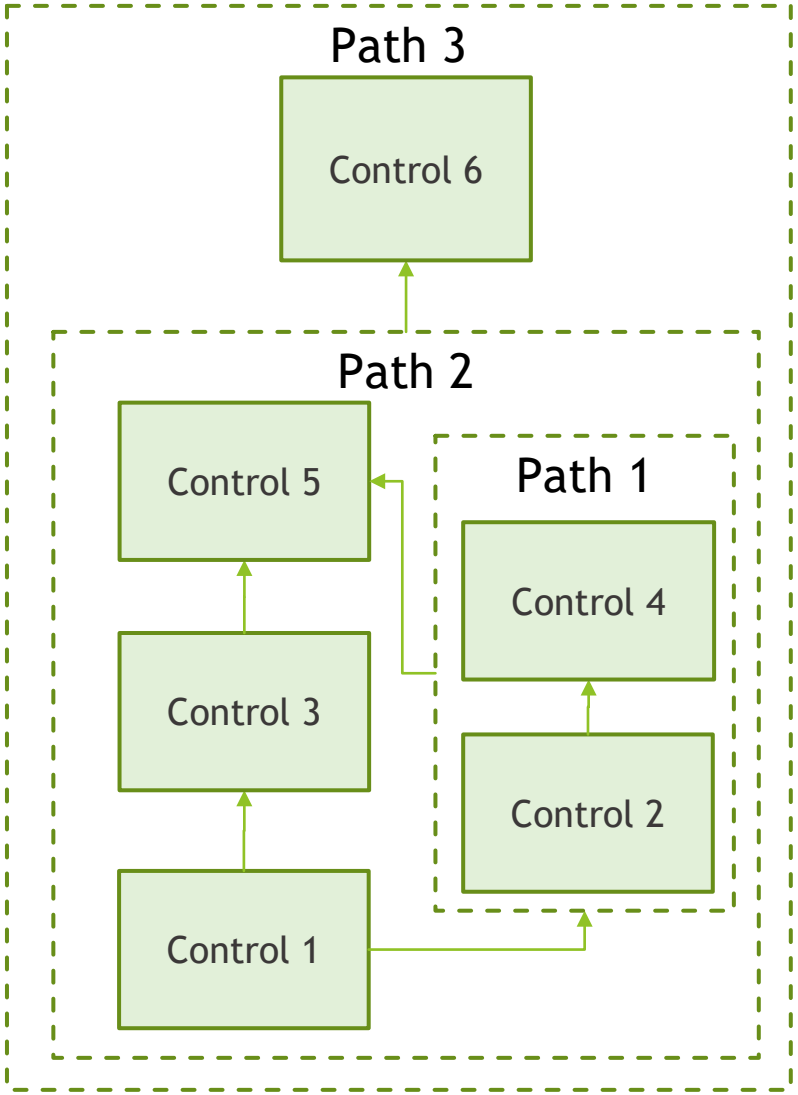
Unit ID	Process ID	Path ID	Release Point ID	Release Point Apportionment
Boiler 1	Process 1	Path 1	Stack 1	100%
Boiler 2	Process 2	Path 2	Stack 1	100%

In Parallel

Control 6



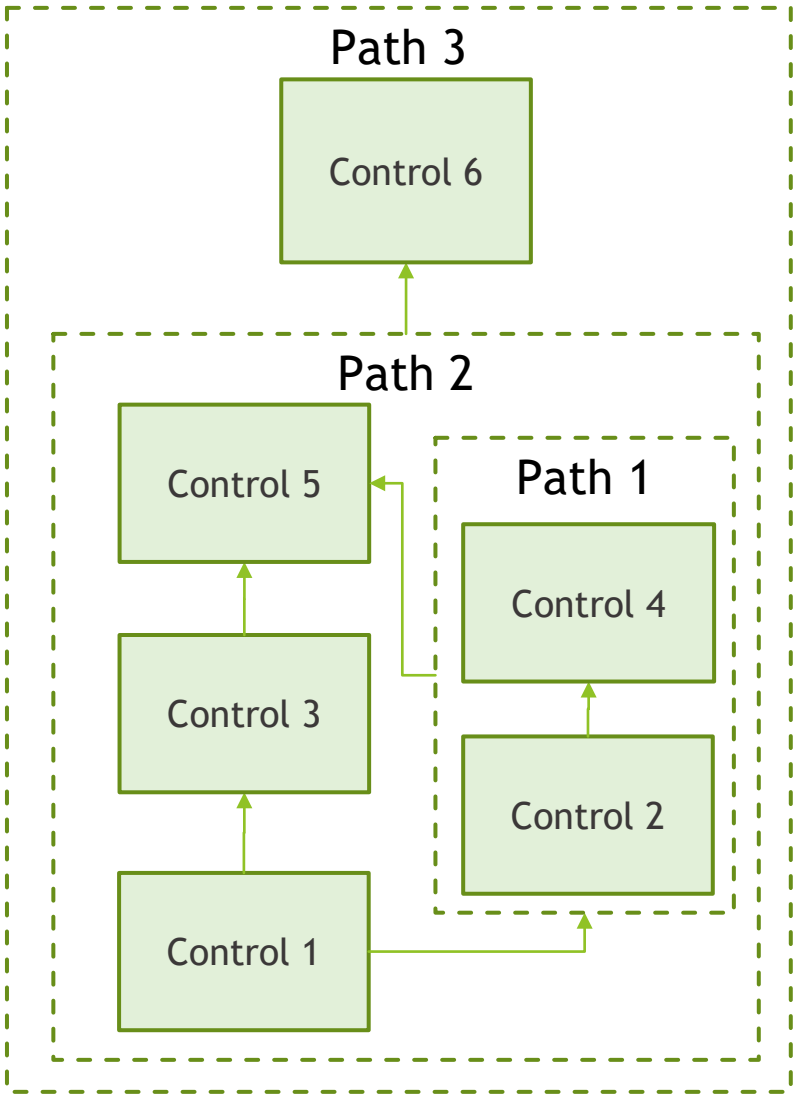
Path 1 is a child path of Path 2. Path 2 is a "primary path" between the process and Stack 3. Path 2 is a child path of Path 3. Path 3 is a "primary path" between the process and Stack 1.



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

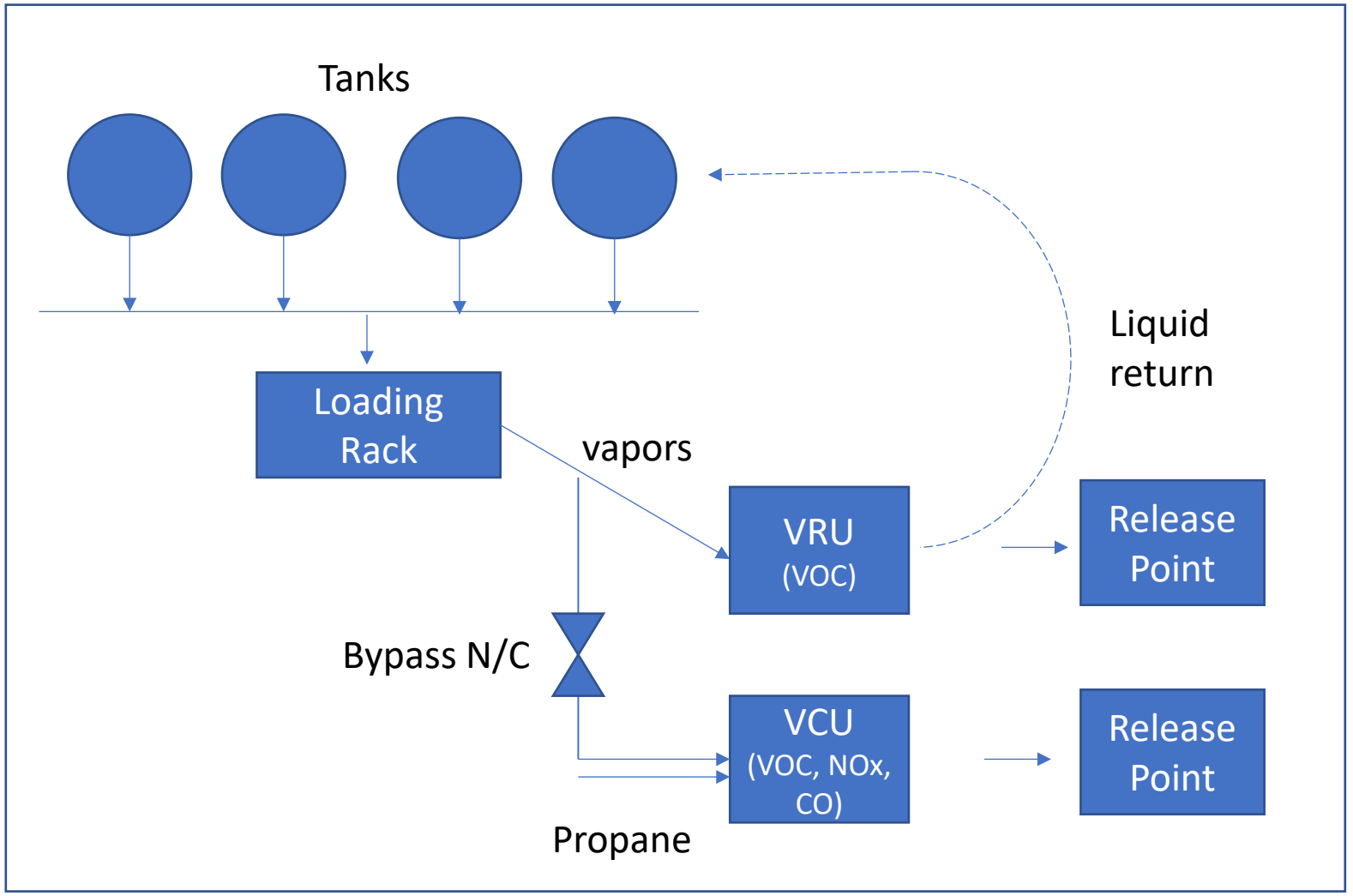
Paths

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

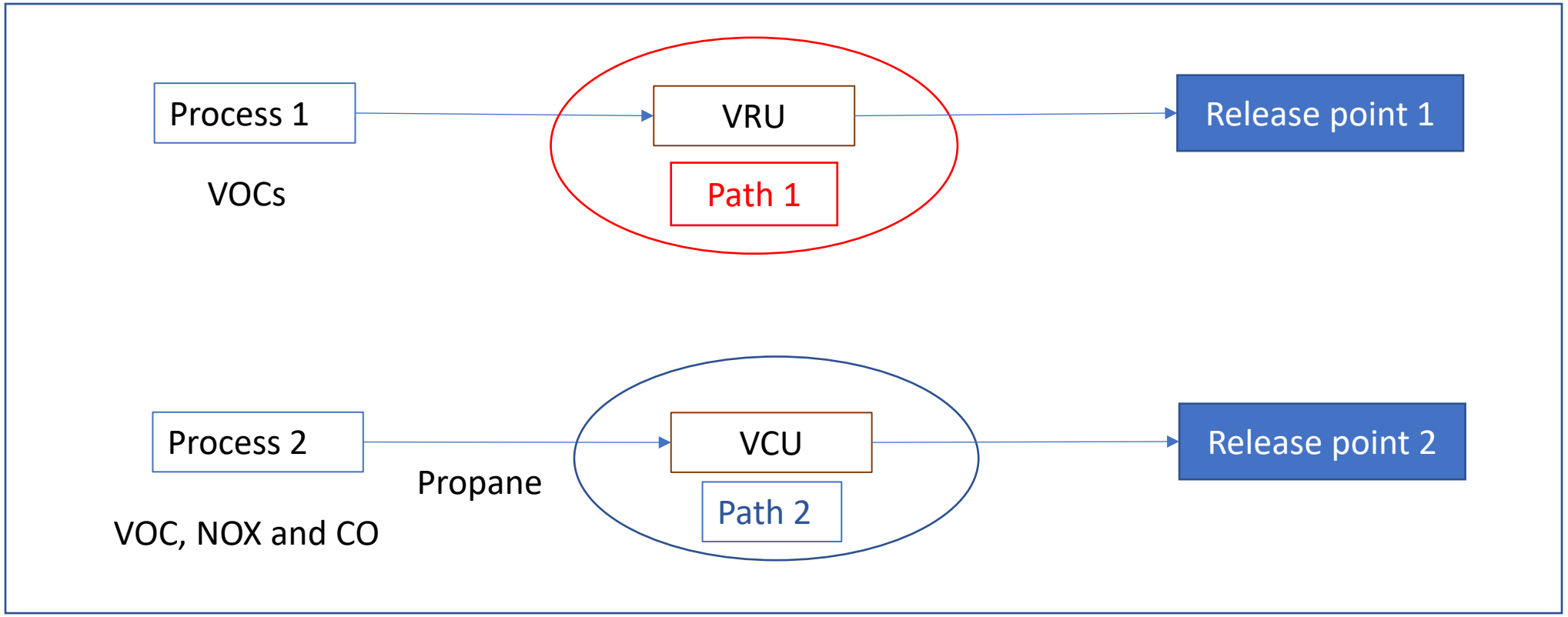


1. The emissions only go to the VCU when the VRU is not working, per permit. The VCU is a backup to the VRU and was only used about 1% of 2019 or about 100 hours.

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

Process 2 (VOC, NOX and CO)

Path 2
VCU Sequence 1

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

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

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