





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

04/14/2021

Updated 4/20/2021 before posting

## Housekeeping:

- This training is being recorded
- Everyone muted, please don't put us on hold
- Type your questions in the chat box
- PPT and recording will be made available on the CAER website

## Disclaimer

This training is intended for instructional purposes only. Any data or facility information shown in the training, is illustrative only, and should not be confused with a facility's live report for any given inventory year.

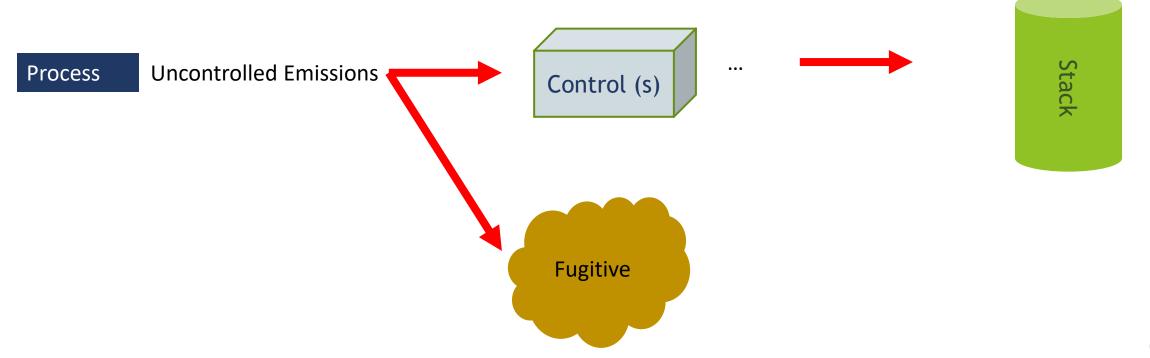
## Outline of Training

- New "Path" Approach Concepts
- Examples & How to Enter Data for:
  - No Controls
  - One Control Device
  - More than One Control Device
- Questions & Answers

## New "Path" Approach Concepts

## Basic Definitions: Release point apportionment

**Percent release point apportionment:** The percentage of an exhaust gas stream that is actually collected for routing to a set of control devices. This value could be obtained from the vendor, or measured at the facility. Previous terminology: Percent capture efficiency. Percent captured = Percent going to "stack" type release points. Percent not captured = percent going to "fugitive" release point.



## Basic Definitions: 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 percent 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.

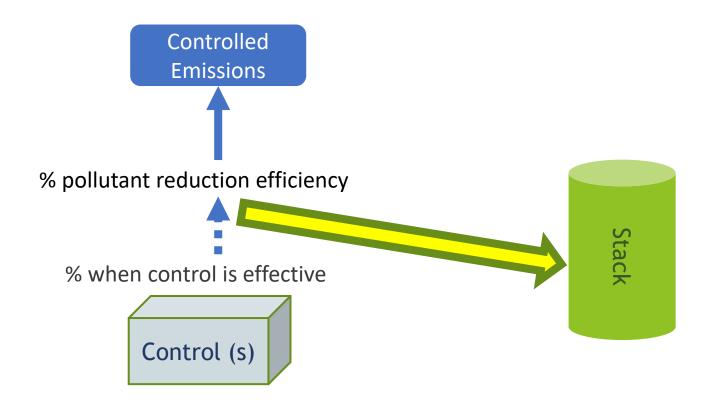
% when control is effective

Control (s)

% when control is not effective

## Basic Definitions: Percent <u>Pollutant</u> Reduction Efficiency

**Percent Pollutant Reduction Efficiency:** The percent reduction achieved for the pollutant when all control measures are operating as designed. This could be obtained from the vendor.



## Previously - "Approach Method"

Approach: Contained a collection of controls applied to a unit or process.

- Could contain:
  - Multiple control measures (scrubber, precipitator, etc.), some controls listed could be a "group" of controls
  - Multiple pollutants being controlled with an overall % reduction efficiency reflecting all
    of the control devices in the control approach
  - ❖ Implicit is that every measure controls every pollutant (which we know is not true)
- Overall % capture efficiency, and % effectiveness
- Allowed us to show the overall reduction % for a given process pollutant - release point combination, but not at individual control level

## Previously – "Approach Method"

#### We couldn't:

- Describe controls configuration at a facility
- Define the relationship between controls and units, process, and / or release points
- "Reuse" controls that are shared with other components (units, processes, and release points) i.e. had to enter an approach containing the relevant control for each unit/process/release point combination
- Change the property values of the control information with ease

## Previously – "Approach Method"

#### We couldn't:

- Describe controls configuration at a facility
- Define the relationship between controls and units, process, and / or release points
- In reporting data, "reuse" controls that are shared with other components (units, processes, and release points) – i.e. had to enter an approach containing the relevant control for each unit/process/release point combination
- Change the property values of the control information with ease

## New – "Path Method"

- A list of individual controls exist for the facility
- Only the pollutants controlled by each individual piece of control
  equipment are listed with the control. The % reduction for the pollutant is
  the amount reduced due to this one piece of equipment.
- Control configuration is defined:
  - Single
  - In series
  - In parallel
  - Combinations
- Controls are placed in paths and can be:
  - "Reused" in reporting
  - Associated and linked between a unit/process and a release point

## New – "Path Method"

#### • A **Path** contains:

- One or more controls that are connected
- A *child* path contains:
  - one or more controls
  - a "smaller" child path containing one or more controls

#### A Main Path contains:

- One or more controls or children paths
- Associates the controls/paths it contains from a unit/process to a release point

## Single Control

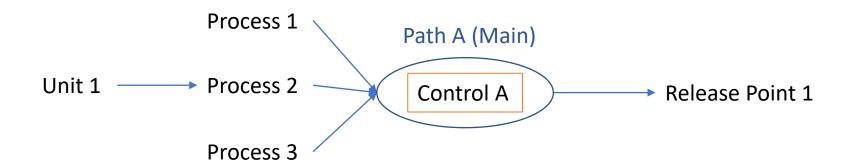
For a single control one path is needed. The control is placed in that path. That path will be the main path and it will associate the process to the release point. Because there's only one control, path assignment is just equal to 1.



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

## Single Control on Multiple Units/Processes

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

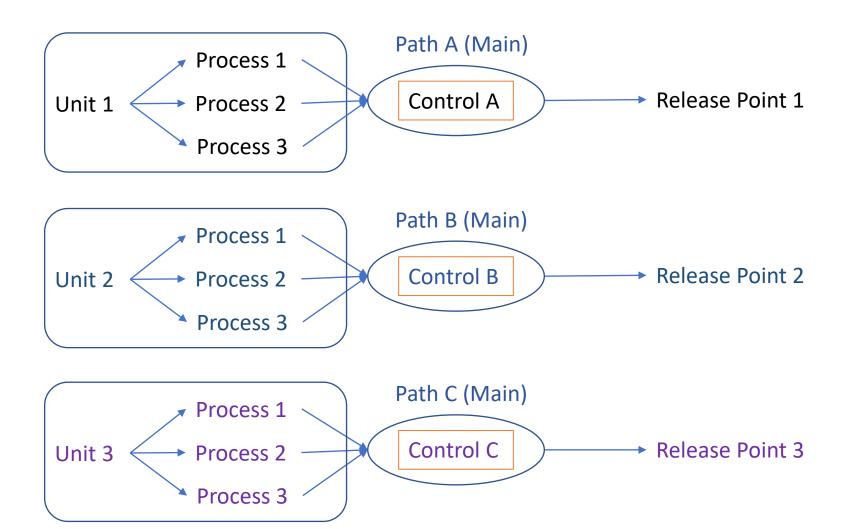


Old Approach method would have required creation of one approach per unit/process/release point combination. New path method "reuses" Path A.

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

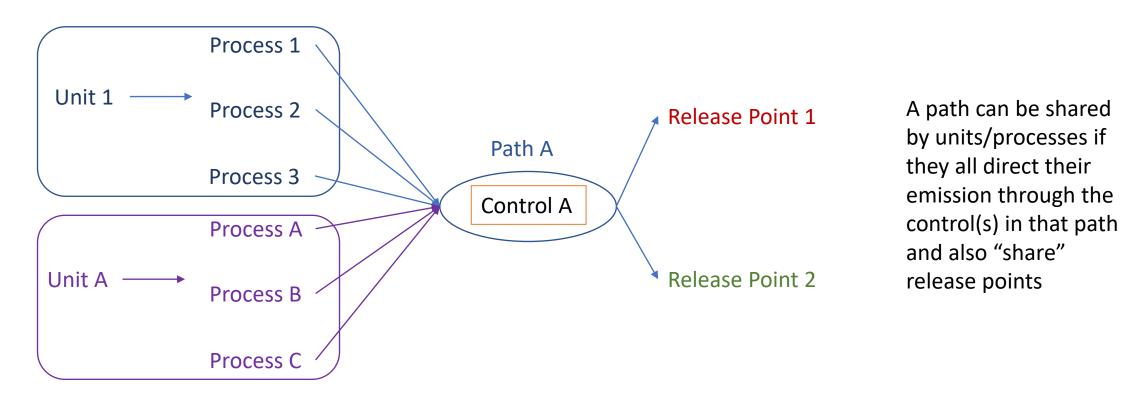
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## Multiple "Single Controls"



The case of multiple controls 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.

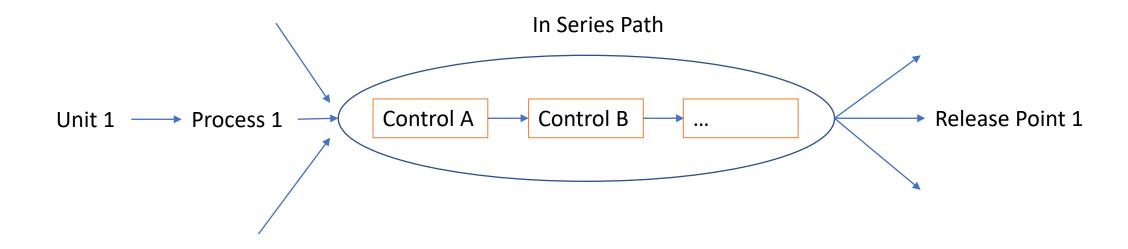
## Single Control on Multiple Units/Processes/Release Points



Old Approach method would have required creation of one approach per unit/process/release point combination (6 approaches). New path method "reuses" Path A.

## Multiple Controls – In Series

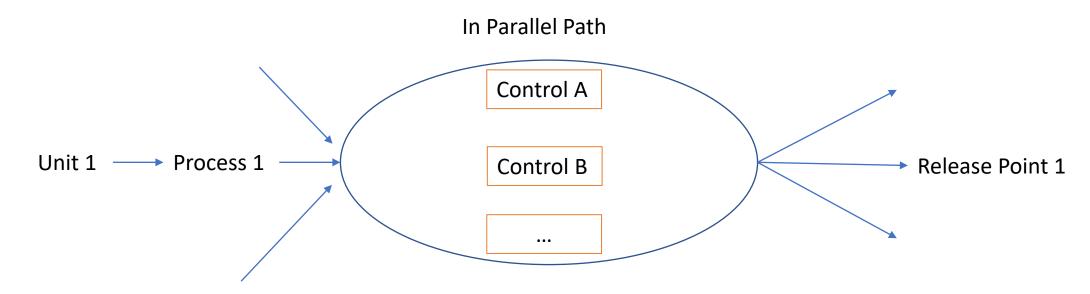
Multiple controls in series can be placed in on path and that path can be reused if it is the main path, as in the previous slide. Instead of a single control, now we have several in series.



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

## Multiple Controls – In Parallel

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



Need: pollutant reduction efficiency, effectiveness of control, release point apportionment (capture efficiency), path assignment (position of control in the sequence, if parallel, all controls have the same sequence number), control apportionment (e.g. 30% per control).

## **Additional Definitions**

- A **Path Assignment** defines the order in which controls 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
- Ultimately, there will be a parent or "master" path that will define the controls that are encountered from the emissions generation point (unit/process) to the release point.
  - Movement of emissions from one control to the next will be tracked via the Control Apportionment
  - Capture of the emissions will be tracked via a Release Point Apportionment

## Additional Definitions

#### Control Apportionment:

- % of the emissions that are coming from a previous control or path
- 100% of the emissions are tracked, a control apportionment percentage < 100% for a control means that some emission are also being routed to another control device or path.

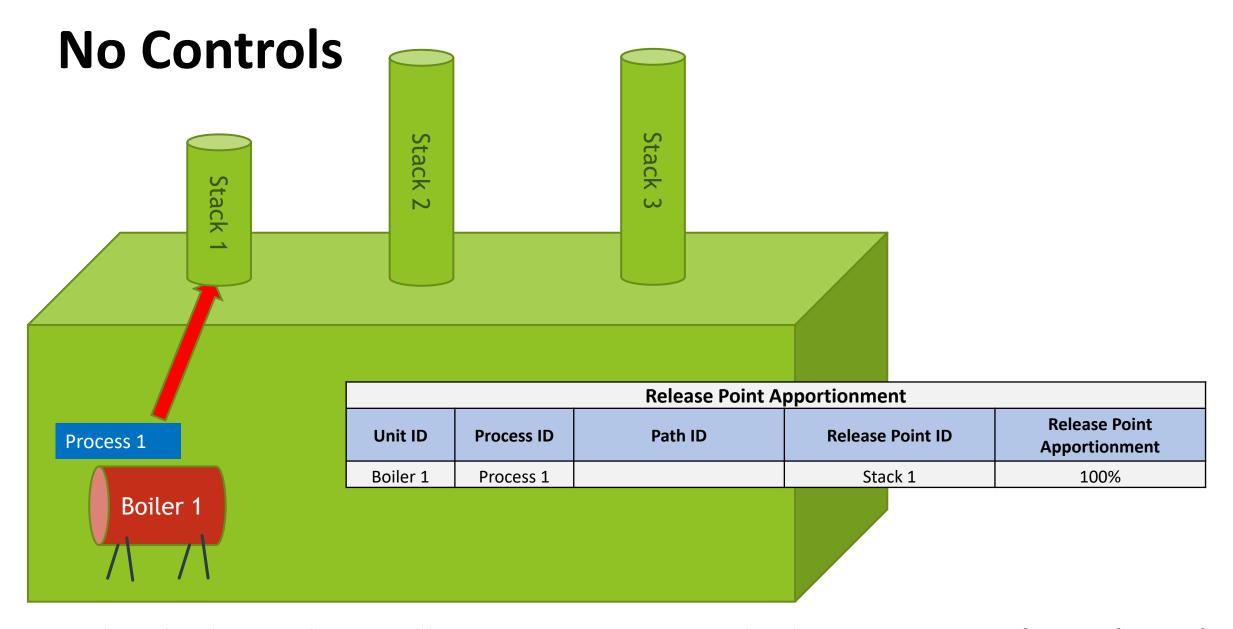
#### Release Point Apportionment:

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

## **Examples & How to Enter Data**

## **General Steps**

- Enter control data (pollutant and % pollutant reduction efficiency)
- Place the control into a path (assignment or sequence #, control apportionment)
  - Control into path
  - Child path into parent path
  - Controls and/or children paths into a main path
- Apportion emissions from the process to the release point



No path needs to be created. You would note a percentage going to stack and a percentage going to fugitives if some of the emissions from the process are fugitive.



## **One Control** Stack Stack Path 1 Fugitive Control A Process: Test 1 Unit: Test Boiler 1

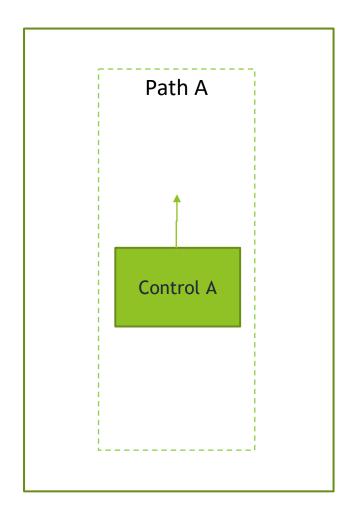


## Numerical Example for One Control

#### **Old Approach Method**

Unit ID	Process ID	Control Applicability Level	Control Description	% Capture	% Effectiveness	Control Comment	Pollutant	% Reduction Efficiency
Test Boiler 1	Test 1	PROCESS	Control A	85%	97%	Control approach	NOX	90%





#### **New Path Method**

#### **Control Data**

Control ID	% Effectiveness	Pollutant	% Efficiency	Overall % Reduction	
Control A	97%	NOX	90%	74%	

#### **Path Data**

Path ID	•	,	Apportionment (Control or Path)	
Path A	1	Control A	100%	

#### **Release Point**

#### Data

Unit ID	Process ID	Path ID	Release Point ID	Release Point Apportionment
Unit 1	Process 1	Path 1	Stack 1	85%
			Fugitive	15%

E.g. Overall% Reduction = apportioned to stack \* effectiveness \* efficiency = 85% \* 97% \* 90% = 74.21%

## One Control in User Interface



## Add New Control in Controls Devices List

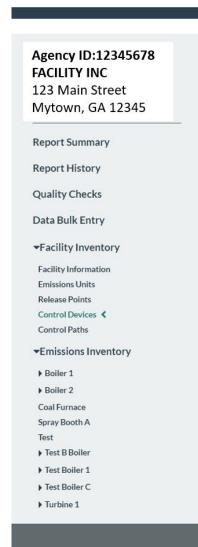
**Upload starting next Monday** 

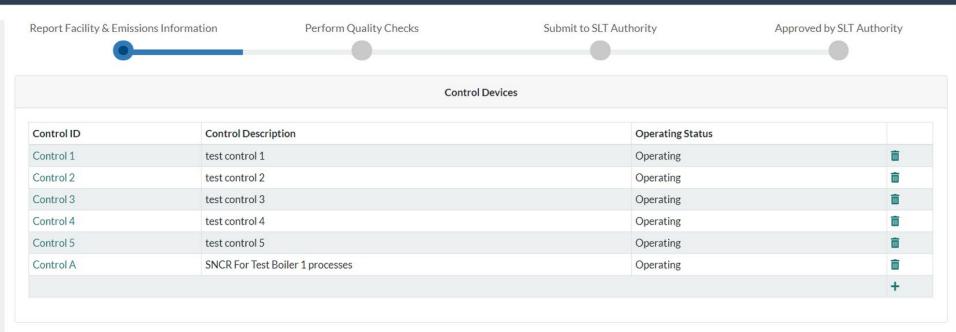
Report Facility & Emissions Information	Perform Quality Checks		Submit to SLT Authority	Арі	proved by SLT Authority	
Control Device Information						
<b>②</b> Control ID:	Control A		Operating Status:	Operating	,	
<b>②</b> Control Measure:	Selective Non-catalytic Reduction (SNCR)	~	Operating Status Year:	2020		
NAME OF THE PROPERTY OF THE PR						
Control Description:	SNCR For Test Boiler 1 processes					
<b>②</b> Control Number Operating Months:	12		Percent Control Effectiveness:			
O Control Start Date:	2018-12-01	iii	O Control Upgrade Date:	yyyy-mm-dd	=	
<b>②</b> Control End Date:	yyyy-mm-dd	=				
Control Upgrade Description:						
Comments:						
					Cancel Save	
A	0 1' 61 1 1/					
	<ul> <li>Control Measure:</li> <li>Control Description:</li> <li>Control Number Operating Months:</li> <li>Control Start Date:</li> <li>Control End Date:</li> <li>Control Upgrade Description:</li> </ul> Comments:	Control ID: Control Measure: Selective Non-catalytic Reduction (SNCR)  SNCR For Test Boiler 1 processes  Control Number Operating Months: Control Start Date: Control End Date: Control Upgrade Description:  Comments:	Control ID: Control Measure: Selective Non-catalytic Reduction (SNCR)  Control Description: SNCR For Test Boiler 1 processes  Control Number Operating Months:  Control Start Date: Control End Date: Control Upgrade Description:  Comments:	② Control ID: Control A   ③ Control Measure: Selective Non-catalytic Reduction (SNCR)   ③ Control Description: SNCR For Test Boiler 1 processes   ⑤ Control Number Operating Months: 12   ④ Control Start Date: 2018-12-01   ⑥ Control End Date: yyyy-mm-dd    ② Control Upgrade Date:	Control ID: Control Measure: Selective Non-catalytic Reduction (SNCR)  Operating Status: Operating Status: Operating Status Year:  2020  SNCR For Test Boller 1 processes  Control Number Operating Months:  Control Start Date: Ocontrol Start Date: Ocontrol Upgrade Description:  Comments:  Comments:	

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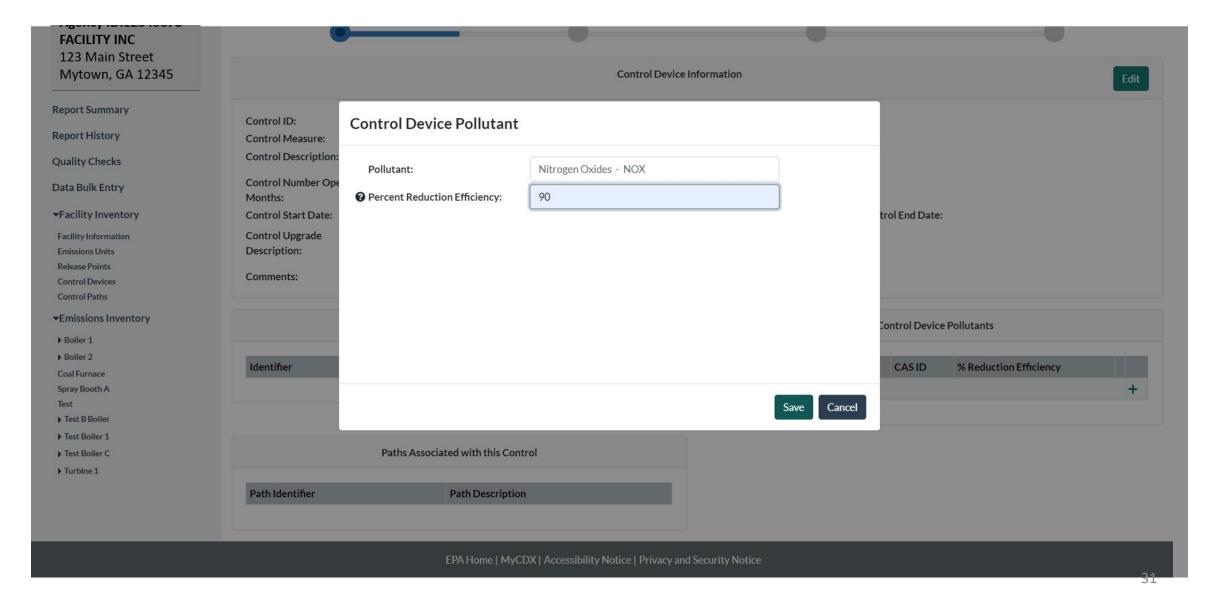
## See New Control in List of Controls





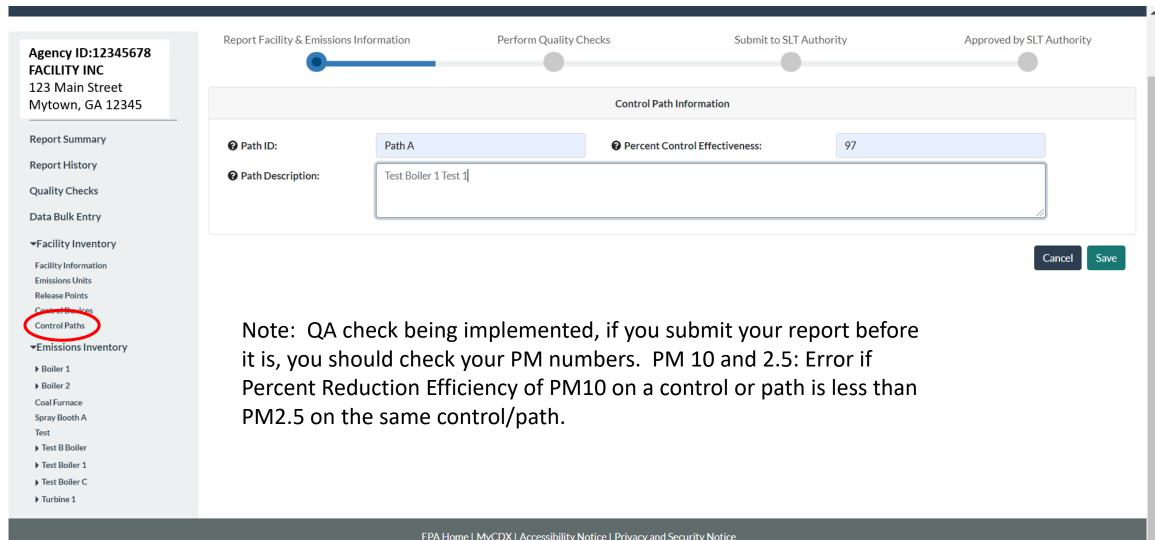


## Select Control and Add Data



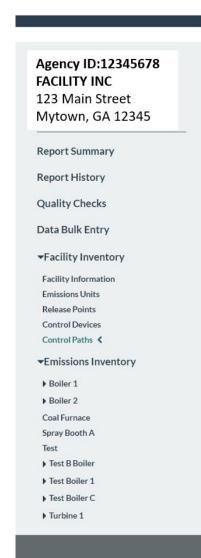


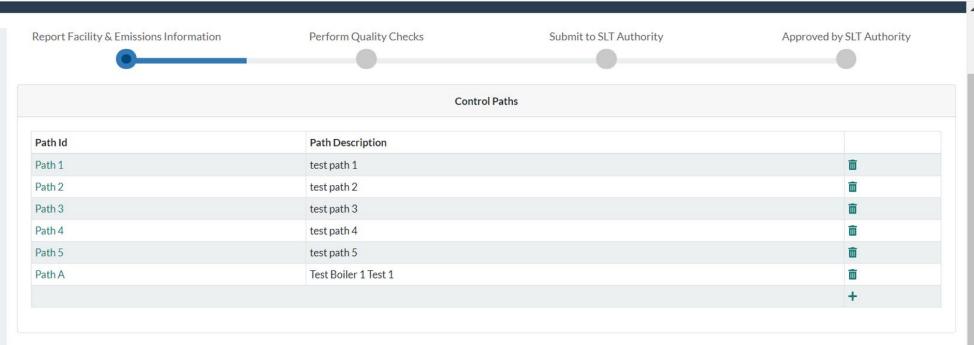
## Create Path for Control in Path List





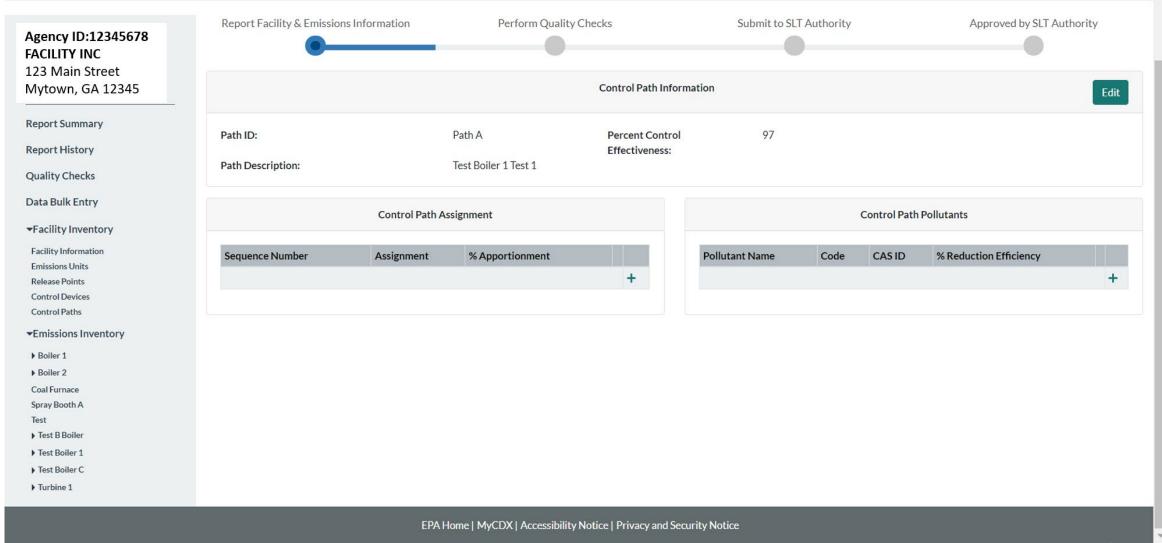
## See New Path in List of Paths





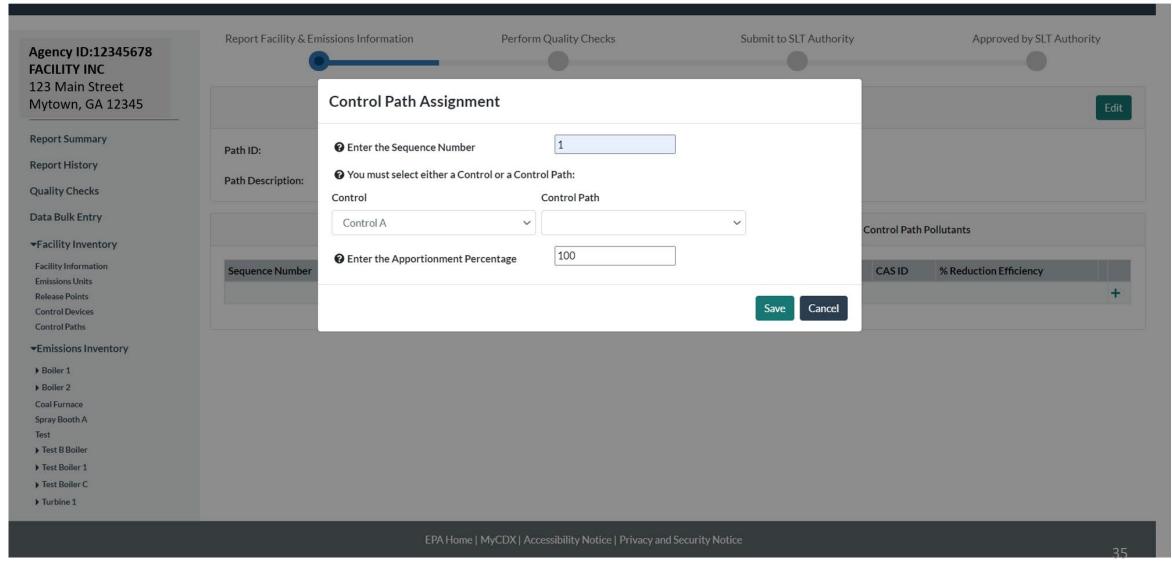


## Select Path and Add Data



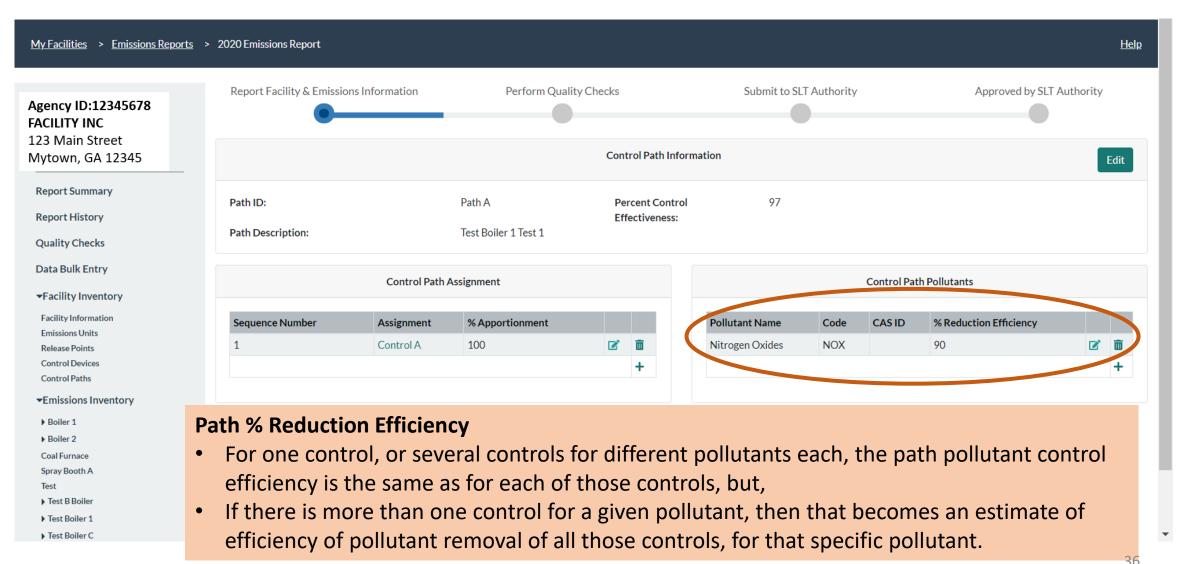


## Control Path Assignment Data



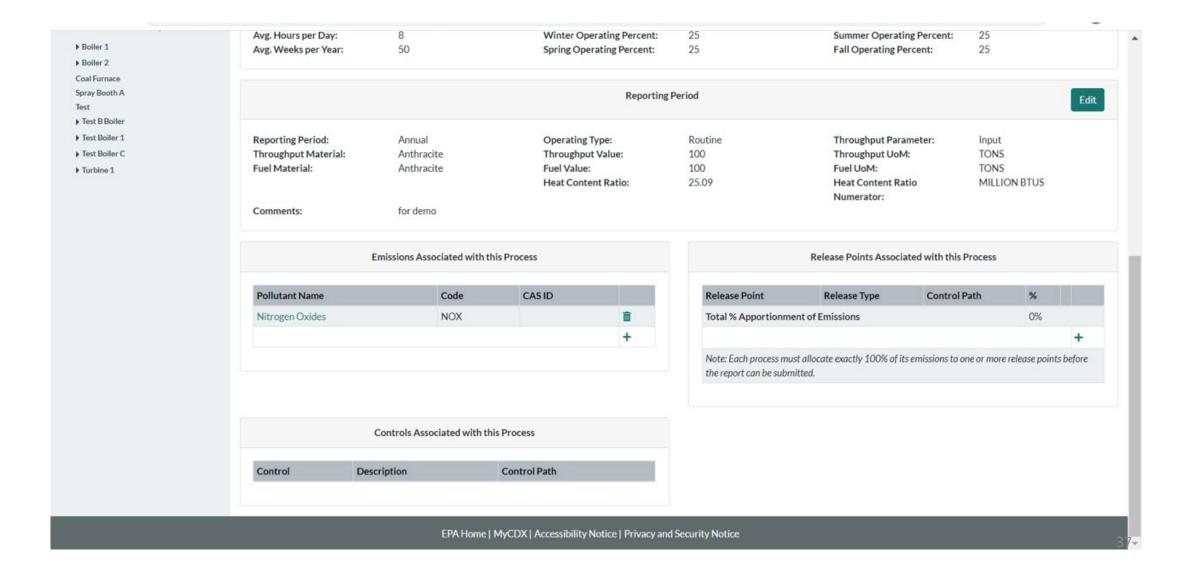


## **Control Path Pollutants**



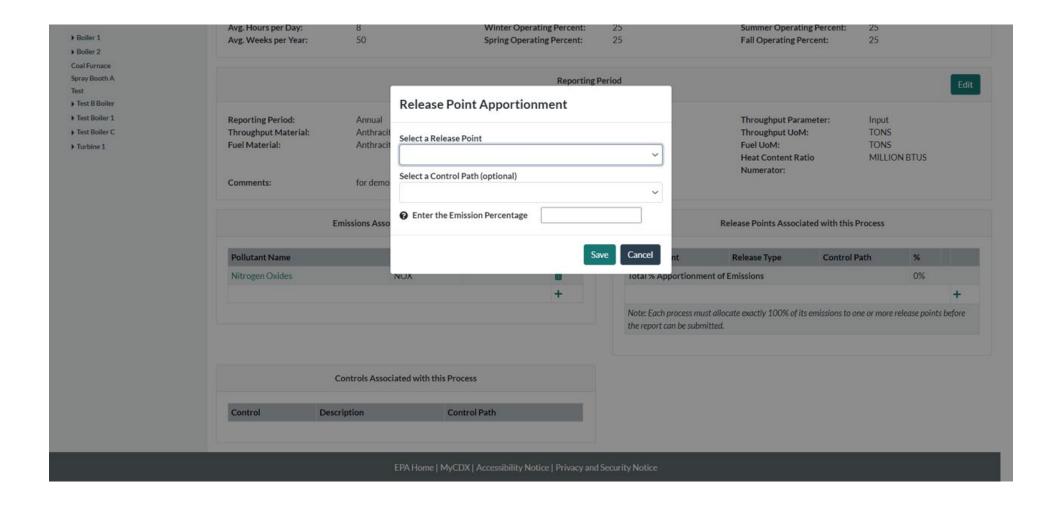


## Select the Process for the Control



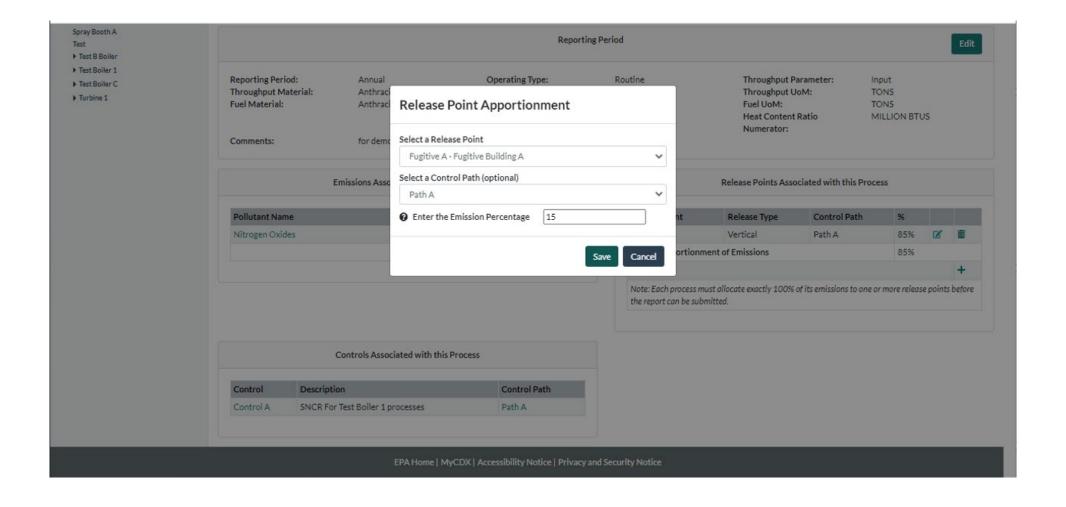


## Select Release Point



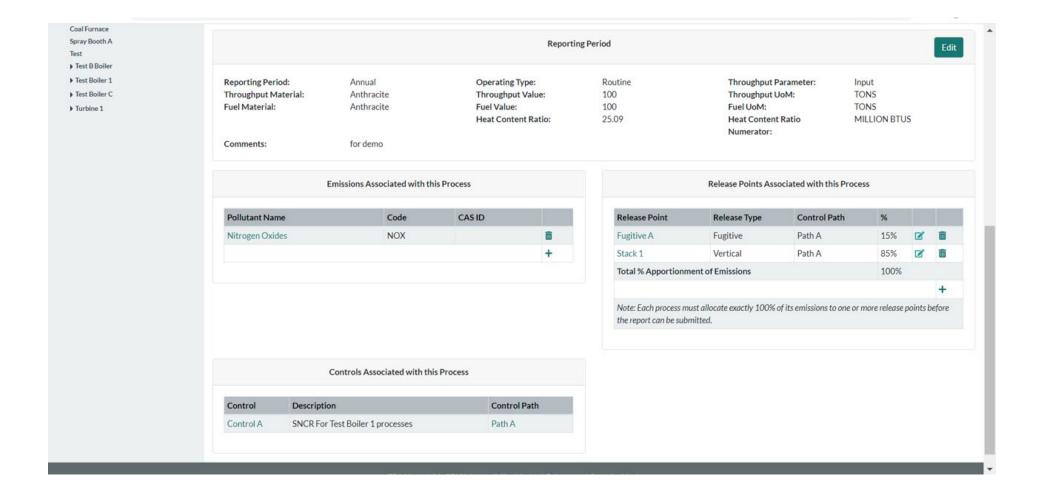


## Associate Process and Release Point



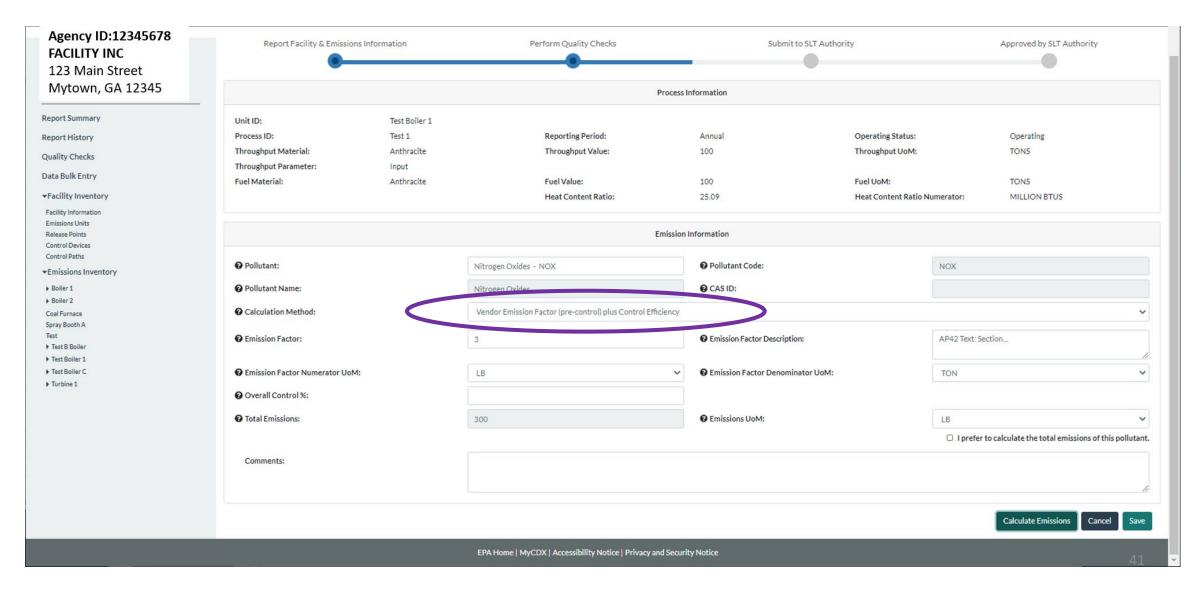


# See Release Point(s) Linked to Process by Path



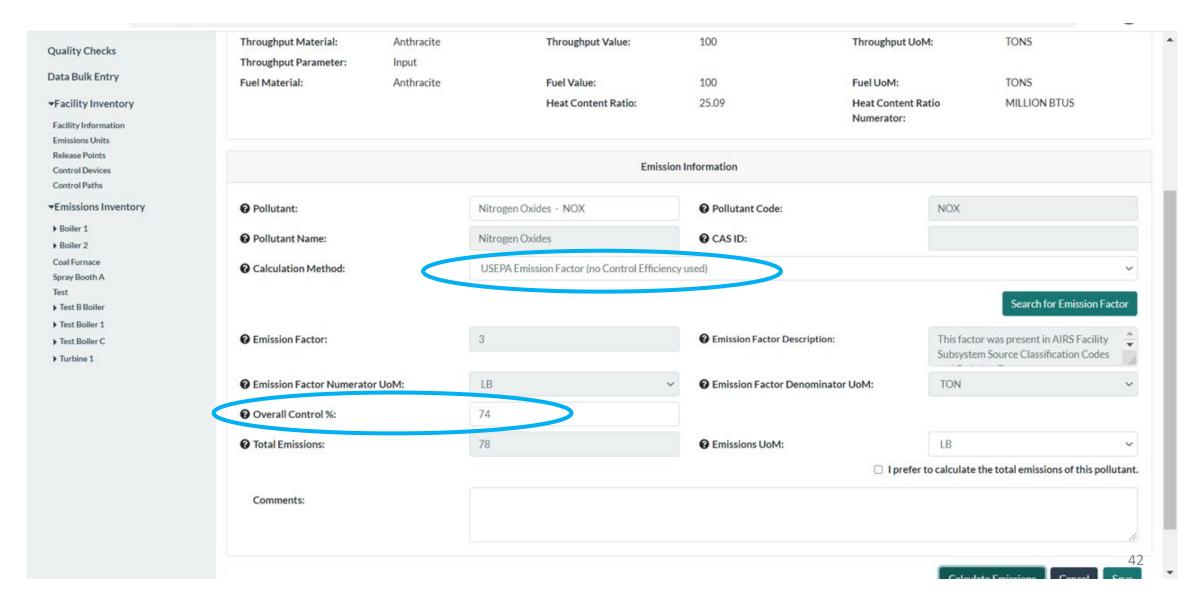


## Can Use Post-Control Emission Factor





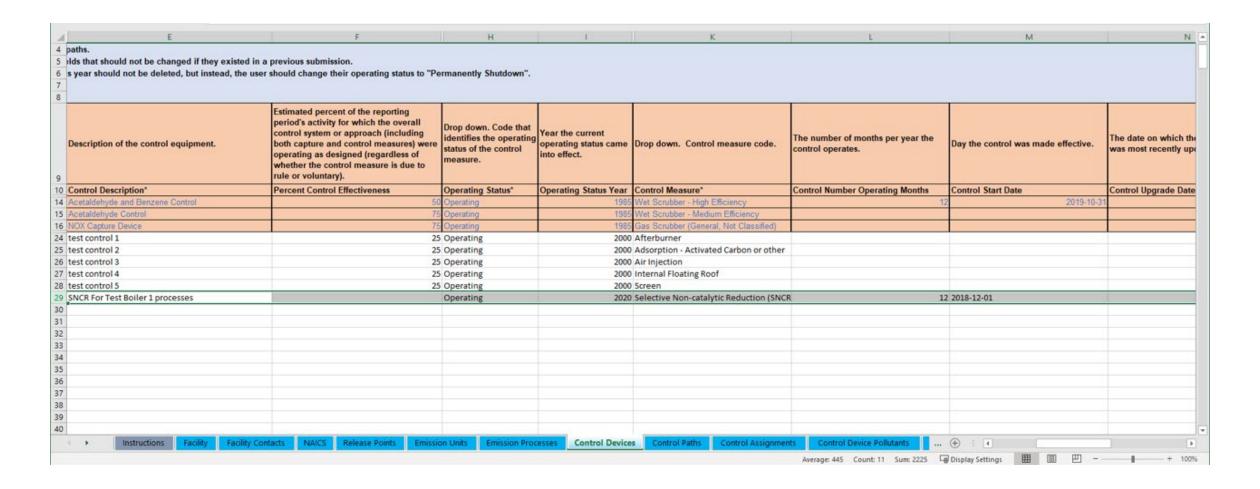
## Can Use Pre-Control Emission Factor



# One Control in Bulk Upload

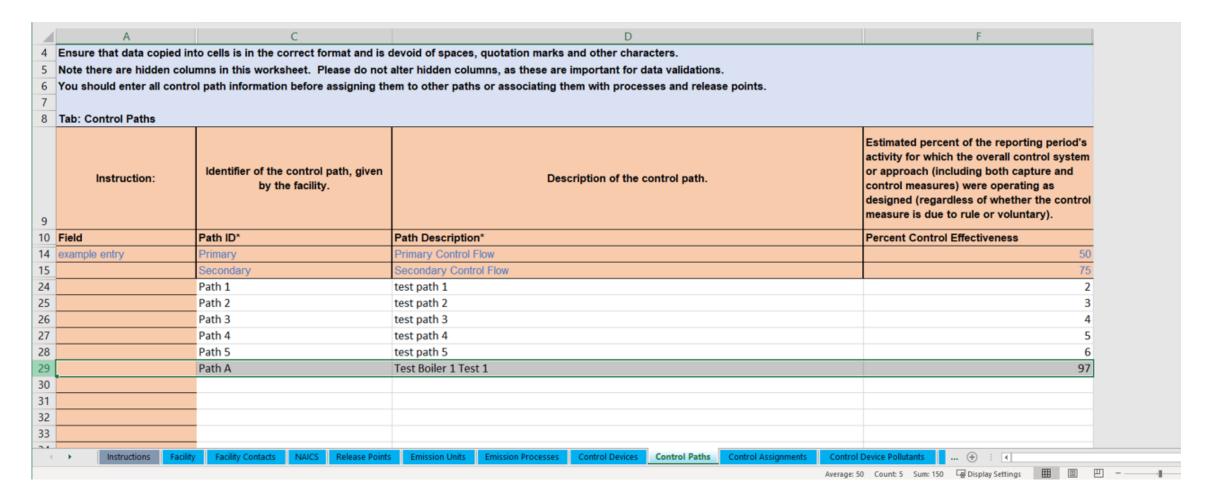


## **Enter Data in Control Devices Tab**



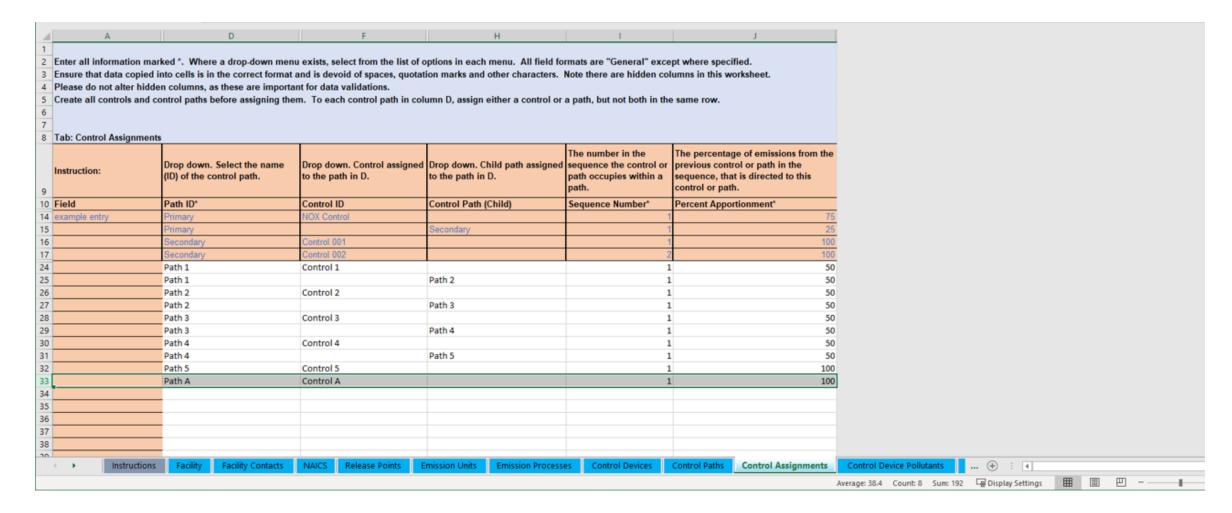


## Enter Data in the Control Paths Tab



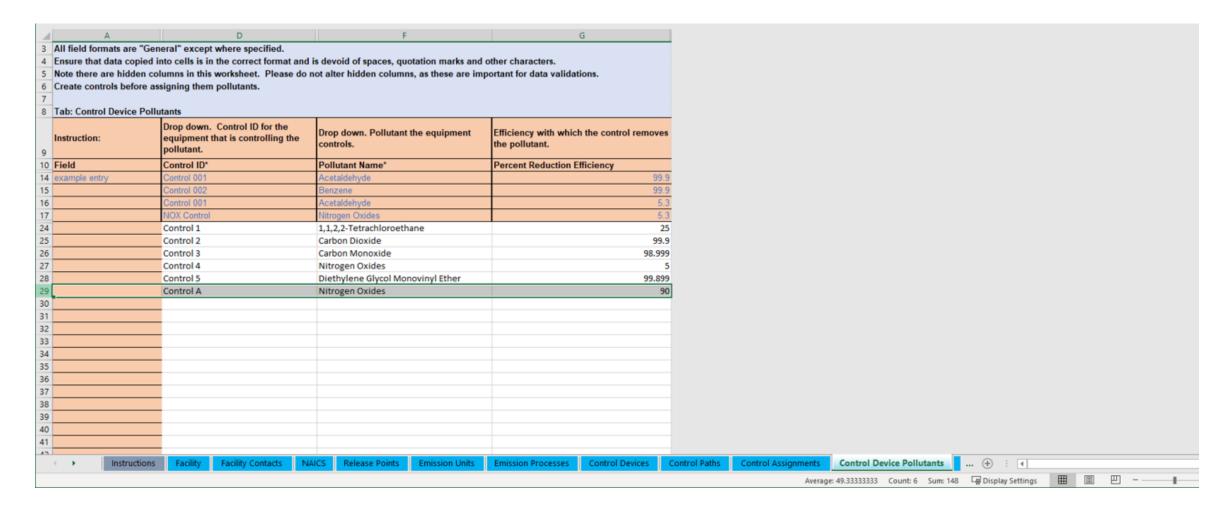


# Enter Data in the Control Assignments Tab



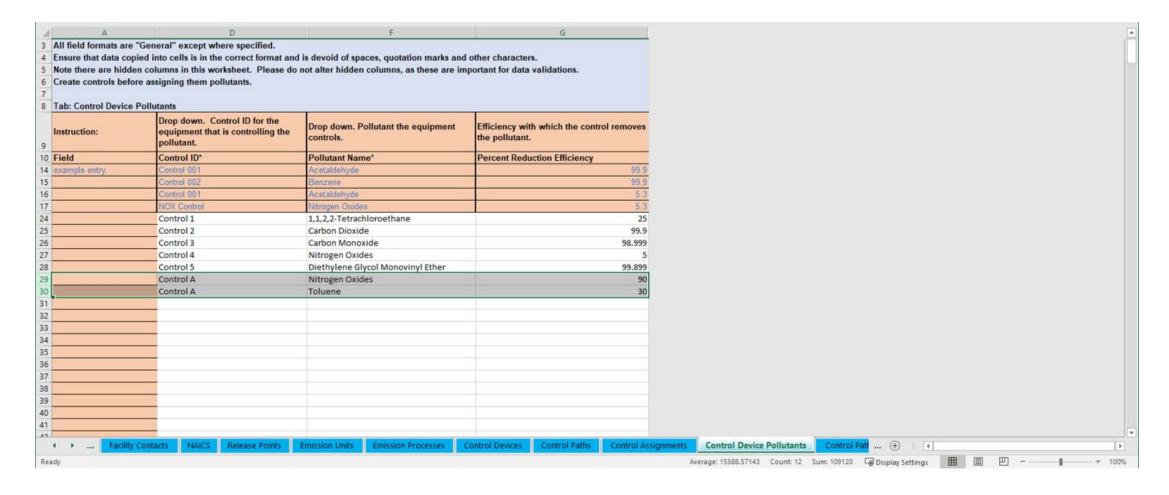


## Enter Data in the Control Device Pollutant Tab



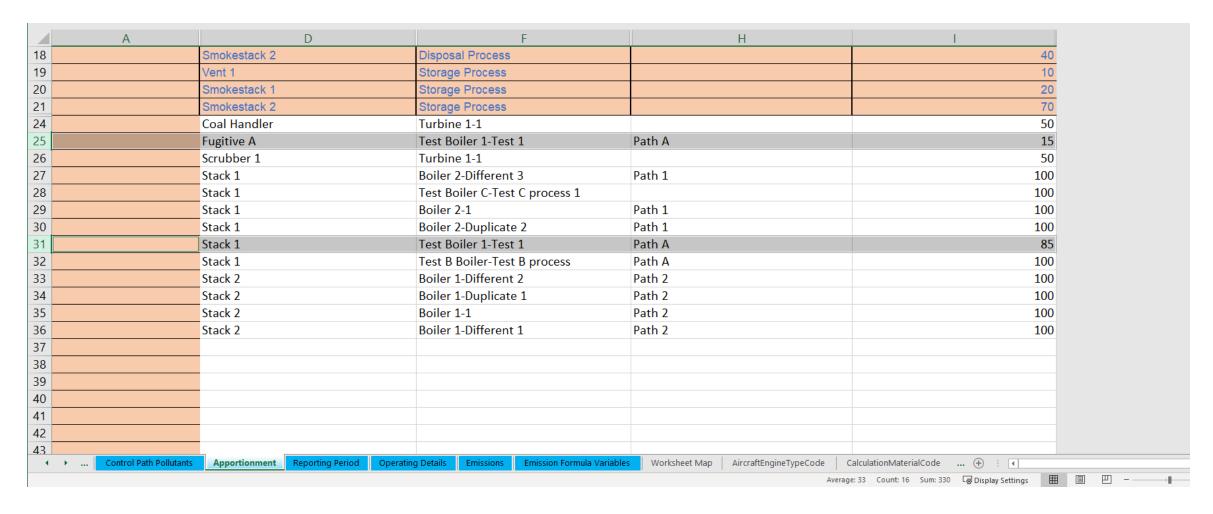


## Enter All Pollutants if More than One



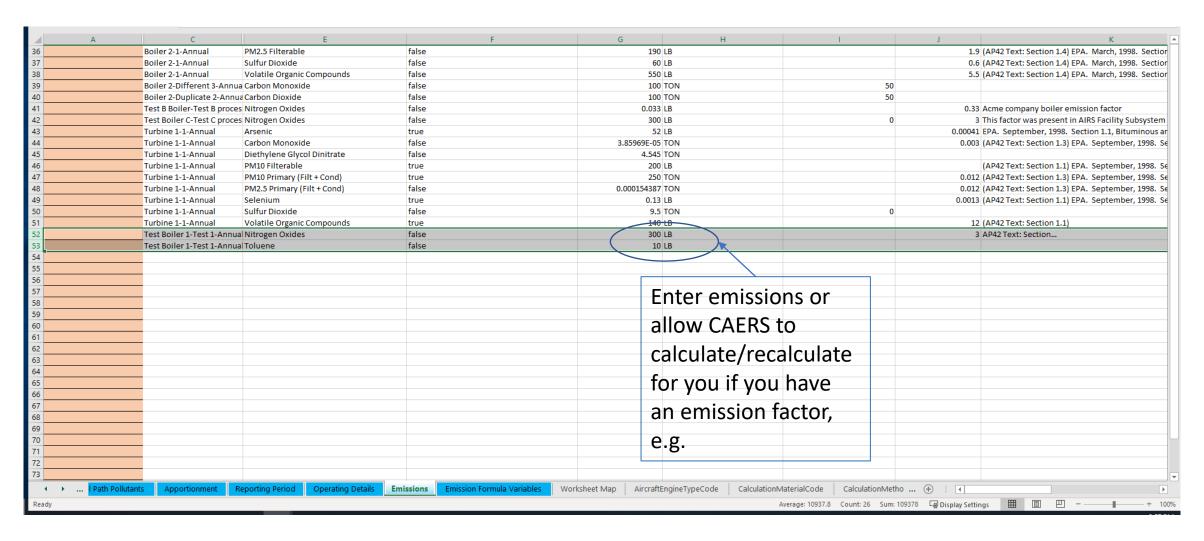


# Enter Data in the Apportionment Tab



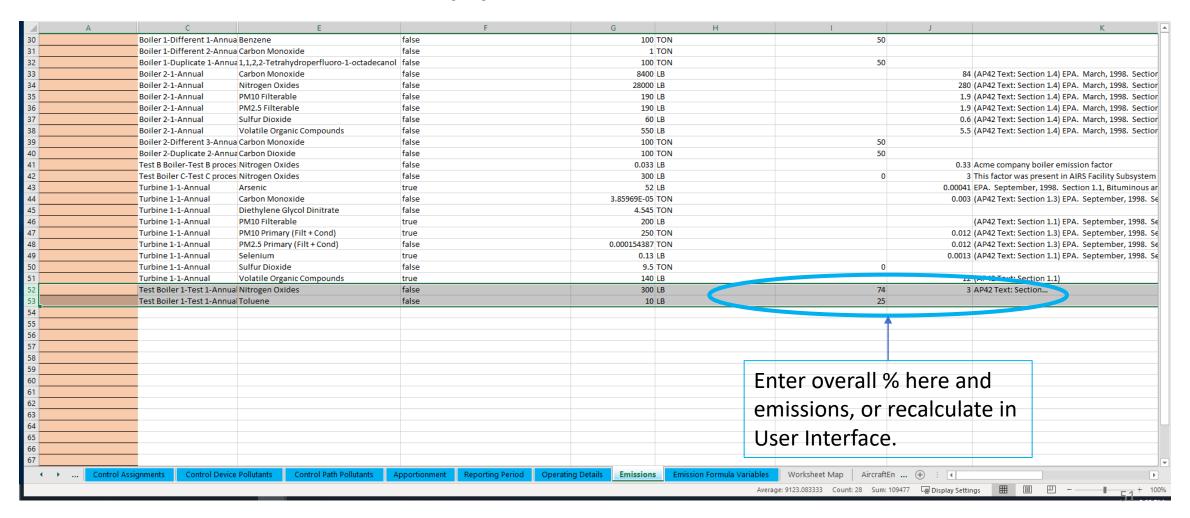


## **Ensure Process Lists Pollutants**





# List Overall % if Applicable

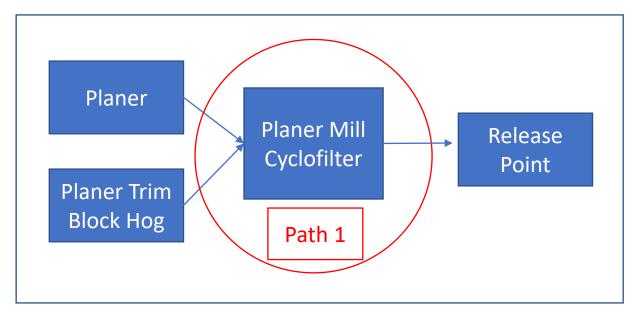


# Considerations to Keep in Mind

- 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 <a href="mailto:caer@epa.gov">caer@epa.gov</a>.
- 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 viceversa.
- If you enter a control device you must also enter its: pollutant reduction efficiency, effectiveness, release point apportionment, and path assignment



# Real Example 1



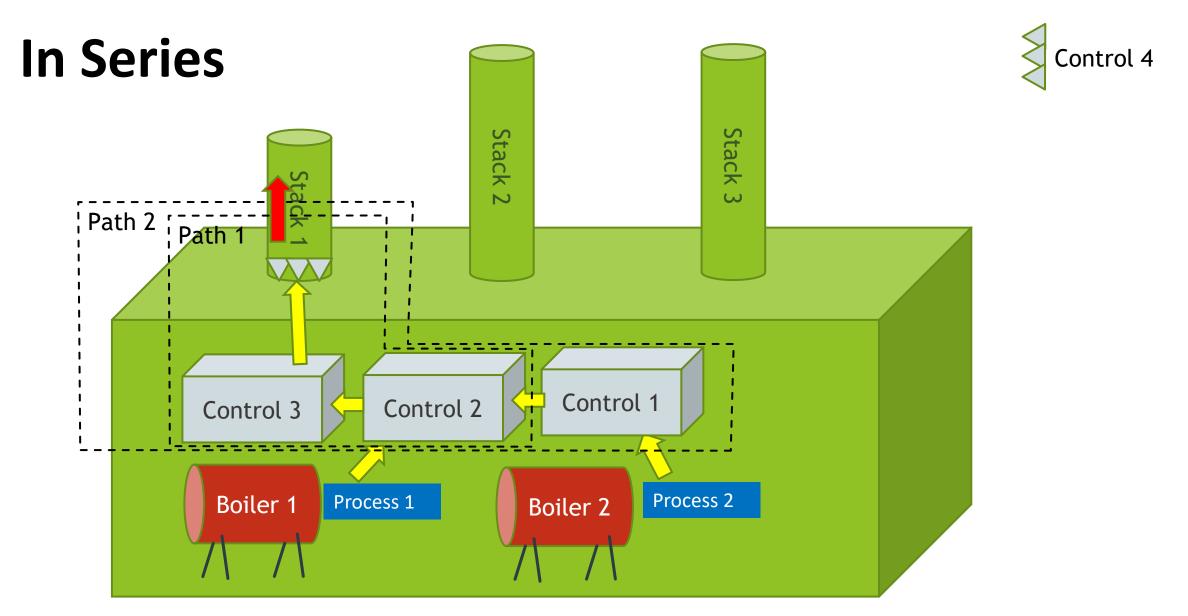
Path Data							
Path ID			Assigned Control or Child Path Apportionment				
Path 1	1	Planer Mill cyclofilter	100%				

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

In this example we have two processes sending emissions into the Planer Mill Cyclofilter. Path 1 can be the main path for the single control and can be used for both processes.

# One Control Device Q&A

## More than One Control



Controls 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 main path between Boiler and Process 1 to Stack 1. Path 2 is the main path between boiler and process 2 and stack 1. Path 1 is a "child" path of Path 2. Path 2 is a "main" path.



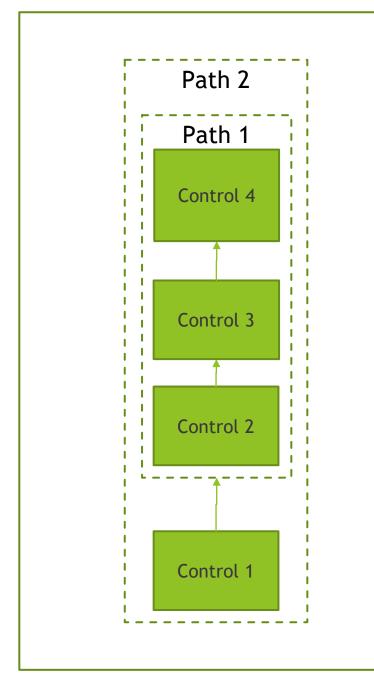
# Numerical Example for Controls in Series

#### **Old Approach Method**

Unit II)	Process ID	Applicability	Control Description	% Capture	% Effectiveness	Control Comment	Pollutant	% Reduction Efficiency
			Control			Control		
Boiler 2	Process 2	PROCESS	approach name	100%	91%	approach	VOC	80%
							со	95%
							PM10-PRI	90%
							PM-CON	100%
							NOX	90%
							SO2	90%

For Boiler 1 you might have a separate approach similar to this one but excluding Control 1.





#### **New Path Method**

#### **Control Data**

Control ID	R.P. Apportiont.	% Effectiveness	Pollutant	% Efficiency	Overall % Reduction
Control 1	100%	95%	voc	80%	76%
			со	95%	90%

Control ID	R.P. Apportiont.	% Effectiveness	Pollutant	% Efficiency	Overall % Reduction
Control 2	100%	90%	PM10-PRI	90%	81%
			PM-CON	100%	90%

Control ID	R.P. Apportiont.	% Effectiveness	Pollutant	% Efficiency	Overall % Reduction
Control 3	100%	90%	NOX	90%	81%

Control ID	R.P. Apportiont.	% Effectiveness	Pollutant	% Efficiency	Overall % Reduction
Scrubber 1	100%	90%	SO2	90%	81%

#### Path Data

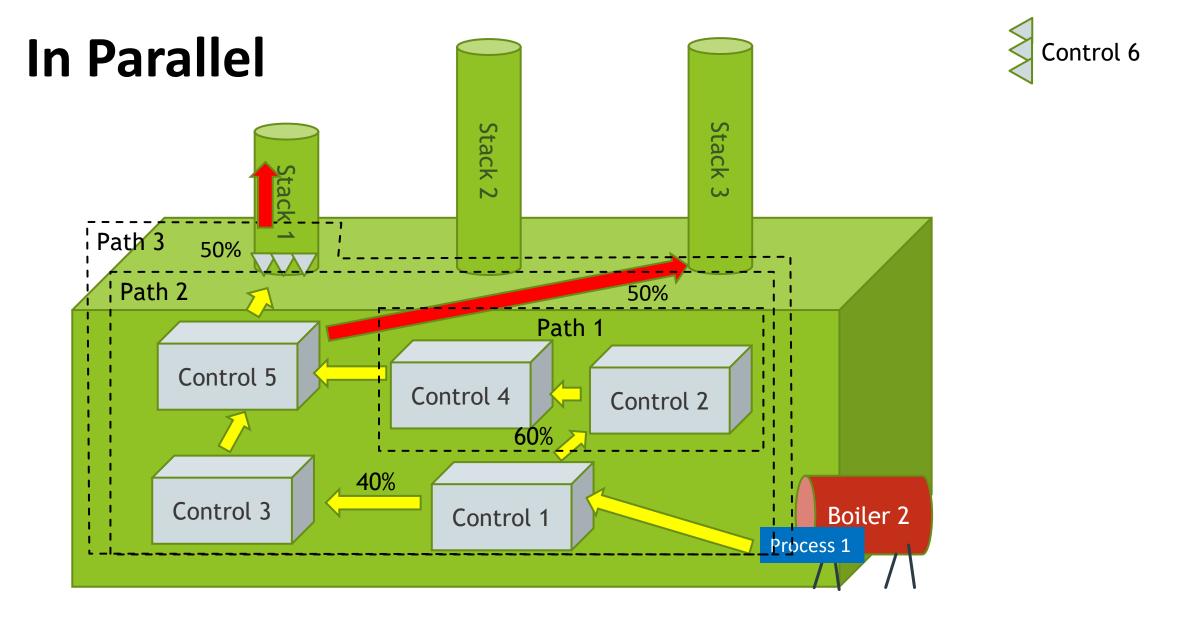
IPath II)	Sequence Number	Assignment (Control or Path)	Apportionment (Control or Path)
Path 1	1	Control 2	100%
Path 1	2	Control 3	100%
Path 1	3	Scrubber 1	100%
Path 2	1	Control 1	100%
Path 2	2	Path 1	100%

#### **Release Point**

#### Data

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%





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

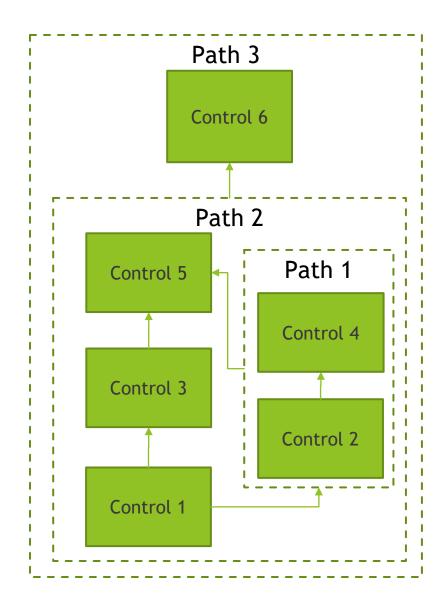


# Numerical Example for Controls in Parallel

#### **Old Approach Method**

Unit ID	Process ID	Control Applicability Level	Control Description	% Capture	% Effectiveness	Control Comment	Pollutant	% Reduction Efficiency
			Control					
Boiler 2	Process 2	PROCESS	approach name	94%	93%	Control approach	voc	80%
							PM10-PRI	90%
							PM-CON	100%
							со	95%
							NOX	99%
							Pb	95%
							SO2	97%





#### **New Path Method**

Control Data					i
Control ID	R.P. Apportiont.	% Effectiveness	Pollutant	% Efficiency	Overall % Reduction
Control 1	90%	95	%voc	80%	
Control ID	R.P. Apportiont.	% Effectiveness	Pollutant	% Efficiency	
	1000		V 21.14.0 PP.	900	Overall % Reduction
Control 2	100%	90	%PM10-PRI PM-CON	90%	
			PIVI-CON	100%	90
Control ID	R.P. Apportiont.	% Effectiveness	Pollutant	% Efficiency	Overall % Reduction
Control 3	100%	90	%со	95%	
Control ID	R.P. Apportiont.	% Effectiveness	Pollutant	% Efficiency	Overall % Reduction
Control 4	80%	95	%NOX	99%	75
Control ID	R.P. Apportiont.	% Effectiveness	Pollutant	% Efficiency	Overall % Reduction
Control 5	95%	90	%Pb	95%	81
Control ID	R.P. Apportiont.	% Effectiveness	Pollutant	% Efficiency	Overall % Reduction
Scrubber 1	100%	98	%SO2	97%	95
Path Data				1	
Path ID	Sequence Number	Assignment (Control or Path)	Apportionment (Control or Path)	_	e path release
Path 1	1	Control 2	100%	point a	pportionment
Path 1		Control 4	100%	9/1% (	ould be weighted
Path 2		Control 1		1	
Path 2		Control 3	40%	average	e or other as
Path 2		Path 1	60%	estima	ted by the facility
Path 2		Control 5	100%	1	
Path 3		Path 2	100%	Teporte	er
Path 3 Release Point		Scrubber 1	100%	3	
Data unit ID	Process ID	Path ID	Release Point ID	Release Point Apportionment	1/
				/	<b>Y</b>
Boiler 2	Process 1	Path 2	Stack 3	47%	
Boiler 2	Process 1	Path 3	Stack 1	47%	
Dailar 3	Process 1	Path 2	Fugitive	3%	<b>S</b> I
Boiler 2					1

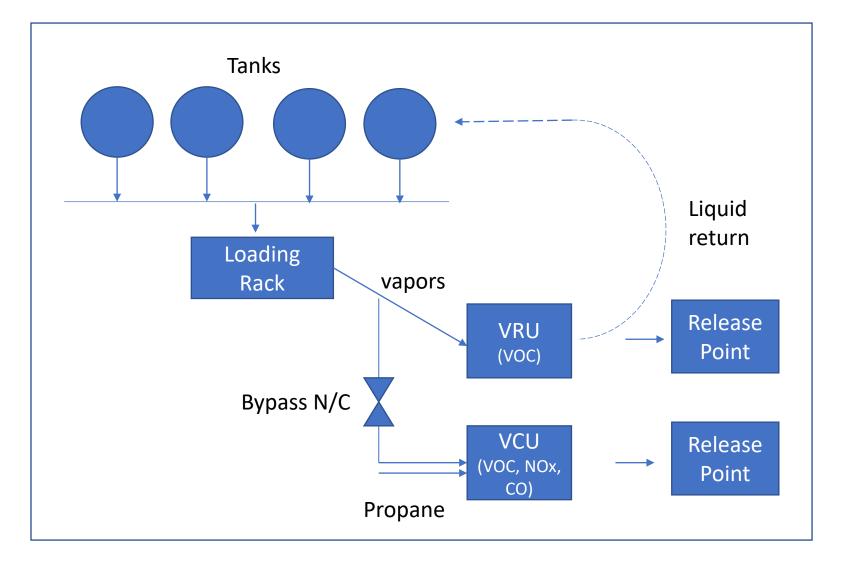
# Additional Considerations about Overall % Controlled

When calculating emissions, if you have more than one control for the *same* pollutant, e.g. controls 1 and 3 both remove SO2, then your Overall % controlled may be:

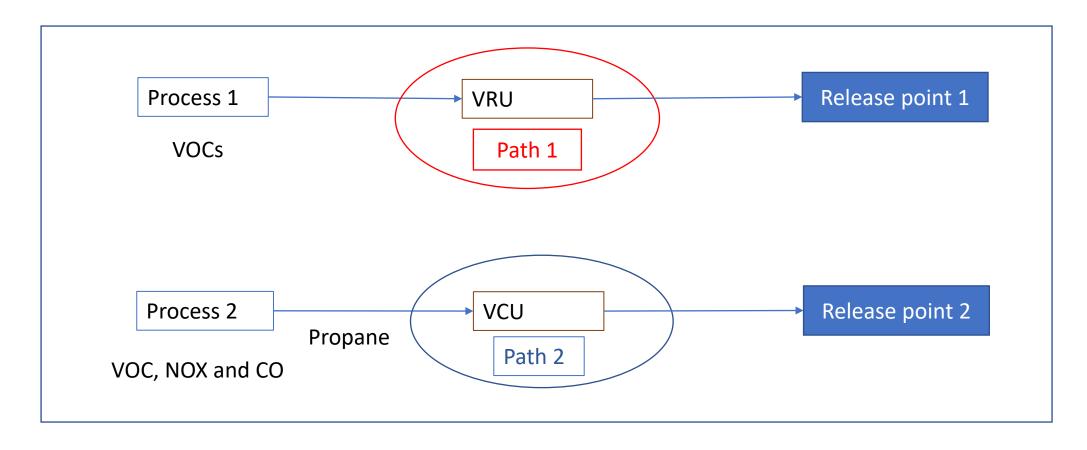
- In series: overall % control 1 \* overall % control 2 \* ...
- In parallel: (overall controlled emissions 1 + overall controlled emissions 2+...)/uncontrolled emissions
- Really complex controls configuration: estimate:
  - e.g. (controlled emissions in series + controlled emissions in parallel)/uncontrolled emissions,
  - e.g. weighted average of the % pollutant control efficiency for all controls



## Real Example 2



- 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 only was used about 1% of 2019, 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's has VOC and NOx/CO.



Process 1 (VOC)

Path 1:
VRU sequence 1

Path 2:
VCU Sequence 1

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

Recall VCU is a "backup" for the first process.



Path Data							
Path ID	Sequence Number	Control or Child Path Assignment	Assigned Control or Child Path Apportionment				
Path 1	1	VRU	100%				
Path 2	1	VCU	100%				

Release Point Data				
Unit ID	Process ID	Path ID	Release Point ID	Release Point Apportionment
Unit 1	Process 1	Path 1	Release Point 1	100%
	Process 2	Path 2	Release Point 2	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.

# "Take Home" Messages about Path Approach

- An inventory of controls is defined at the facility level
- The relationship between the controls is defined by one or more "control paths"
  - You must define a path for each unique set of controls encountered between the emissions generation point and the release point
  - A path is composed of controls AND / OR paths
  - You define the order of the controls through these associations
  - You may define sets of controls that operate at the same time (parallel controls) by defining the percentage of the stream that flows in one direction or another.
- Associate a release point apportionment record to a given path

# Additional Considerations for More than One Control

- How you set up the paths and controls in them for complex control
  set ups is up to you so long as the basic rules of child/parent/main
  paths are followed and all required data is entered.
- Path level pollutant efficiency may be an estimate, for paths containing several controls for a single pollutant. E.g. two controls that remove NOx.
  - **In series:** multiplication of control efficiencies
  - In parallel: controlled emissions from efficiency/total uncontrolled, average, weighted average
  - More complex controls: average, weighted average

## How to Get Help

### Regardless of what help you need always send:

- 1. Facility name and ID
- 2. Screenshot(s) of error you are getting
- 3. BU template you are 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. Help Desk first (Click Help in UI top right of your screen)
- 2. Your SLT (they will elevate to EPA as needed)



### **UPCOMING HELP SESSIONS**

- GA EPD HAPs Reporting in CAERS for 2020 NEI
  - Tuesday, April 20 2:30 3:30 PM
  - Register: <a href="https://geco.gaepd.org/EventRegistration/Default.aspx">https://geco.gaepd.org/EventRegistration/Default.aspx</a>
- Live Virtual Help Sessions (April June)
  - Email sign-up will be offered
  - Attendance Requirements:
    - Send questions to <a href="mailto:emissions.inventory@dnr.ga.gov">emissions.inventory@dnr.ga.gov</a> with a screen shot of your problem
    - We will try to address by email first
    - If not resolved by email, we will provide a live help session time slot
  - Help Session Times
    - Every other Tuesday & Thursday from April 27 May 27
    - Every Tuesday & Thursday in June
    - Tuesdays: 10-11 AM; Thursdays: 2-3 PM

# Help Sessions for Other SLTs

To be scheduled. Reach out to your SLT if you need help via office hours, if help desk have not been able to help you resolve your issue.

# Q & A