ICR Number XXXX.XX
OMB Control Number: XXXX-XXXX
Expiration Date: mm/dd/yyyy

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name

Steam Electric Questionnaire
Second FRN Version Draft

PART C - ASH HANDLING

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Plant ID: Insert Plant ID
Plant Name: Insert Plant Name

PART C. ASH HANDLING

INSTRUCTIONS

Part C requests information about ash handling operations at your plant. Complete Part C if ash is generated in any fossil-fueled steam electric generating units at your plant. See Part A Section 8 for steam electric generating unit fuel classifications.

As you are completing the electronic form, note the following: When you enter your plant name and plant ID on the Part C TOC tab, all name and ID fields throughout Part C will automatically populate. Refer to the overall questionnaire instructions, the glossary, and the acronym list for assistance with completing Part C.

Please provide all free response answers in the highlighted yellow areas. Throughout Part C, you may need to make copies of certain sections/questions. Instructions are provided throughout Part C regarding making copies. Note that Steam Electric Unit IDs or Ash Handling System IDs must be populated on the copied tab or section, located in the upper right corner under "Plant ID" and "Plant Name", in order to correlate the requested information with the steam electric unit or ash handling system.

Where the questionnaire indicates to provide an attachment, an electronic format (e.g., PDF) is preferred; however, hardcopies are also acceptable.

Use the Part C Comments tab to do the following: provide additional information as requested in certain questions within Part C; indicate atypical data (e.g., if 2009 information is not representative of normal operations); and note methods used to make best engineering estimates in the event that exact data are not available.

Refer to the following definitions throughout Part C:

"Fly ash collection" is the separation of fly ash from the flue gas. Examples of fly ash collection equipment include ESPs and baghouses. Fly ash may also be collected by wet scrubbers.

"Fly ash conveyance" is the conveyance of fly ash from the fly ash collection equipment (ESP or baghouse) of one or more generating units to intermediate or final storage (e.g., storage silos or ponds/impoundments). Common dry fly ash conveyance components include filter/separators, vacuum/pressure transfer stations, high pressure blowers, and associated high pressure piping (note that conveyance does NOT include the storage/loading silos). Wet fly ash conveyance equipment is used to sluice fly ash and pump it to wet ash storage (e.g., ash ponds/impoundments).

"Bottom ash conveyance" is the conveyance of bottom ash from the boiler(s) of one or more generating units to the intermediate or final storage of the bottom ash. Dry bottom ash conveyance does not use water to convey bottom ash to intermediate/final storage. Dry bottom ash conveyance includes systems that collect and convey the bottom ash without any use of water, as well as systems in which bottom ash is conveyed mechanically or pneumatically away from a quench water bath (e.g., submerged chain conveyor systems). Wet bottom ash conveyance uses water (i.e., a sluice) to convey bottom ash away from the boiler to intermediate/final storage (e.g., ponds/impoundments). Note that dewatering bins are considered part of bottom ash conveyance.

"Intermediate storage" refers to a facility or site where collected fly ash or bottom ash is stored after conveyance and prior to being transported to final disposal. Dry fly ash intermediate storage typically consists of storage silos. Dry bottom ash intermediate storage typically consists of stackout/holding areas for the bottom ash collected from mechanical drag systems. Wet fly ash or bottom ash intermediate storage typically consists of ponds/impoundments.

"Ash transport/disposal" refers to the transportation of ash from intermediate storage to final disposal. Examples of ash transport/disposal include transportation used to haul ash off site (e.g., ash that is marketed and shipped off site to a reuse application). Ash transport typically consists of roads and vehicles that are used to transport the ash.

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name

Part: C
Section Title: 1. Ash Generation

CBI? ☐ Yes

C1-1. Is ash generated in any fossil-fueled steam electric generating units at the plant? See Part A Section 8 for steam electric generating unit fuel classifications.

○ Yes (Continue)
○ No (Skip to next Questionnaire Part)

CBI? ☐ Yes

C1-2. In Table C-1, indicate the total acreage of the *plant* for each of the following categories, including all contiguous and non-adjoining property under the operational control of the facility.

Table C-1. Plant Acreage Breakdown

Category	Acreage
Total Plant Area	
Parking lots	
Buildings	
Other developed area	
Open ash ponds	
Open landfills	
Closed ponds/impoundments and landfills	
Unusable land (e.g., wetlands) Specify type(s):	
Other:	
Other:	

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name

Part: C
Section Title: 2.1. Fly Ash Handling - System Level Information

Instructions: Throughout Section 2.1 (Questions C2-1 and C2-2), provide ash handling information for each fly ash handling system, operated at any time in 2009, including systems that may have been idle for an extended period of time, that service at least one fossil-fueled steam electric generating unit.

CBI?
☐ Yes

C2-1. Is fly ash generated in any fossil-fueled steam electric generating units at the plant? See Part A Section 8 for steam electric generating unit fuel classifications.

○ Yes (Continue)
○ No (Skip to Section 3.1)

CBI?
☐ Yes

C2-2. Provide fly ash handling information in Table C-2, following these instructions:

- Provide information at the fly ash handling system level. For the purpose of this questionnaire, fly ash handling systems include all components associated with the conveyance of fly ash from the hoppers, intermediate storage of the fly ash, and transport/disposal of fly ash (i.e., all components from hoppers to final fly ash disposition). As an example, if fly ash from multiple steam electric generating units/hoppers is either conveyed together or separately to a common silo by the same method (e.g., vacuum/pressure conveyance), all associated conveyance equipment and silo (and final transport/disposal) should be considered/identified as one fly ash handling system. As another example, if multiple pipes are used to sluice fly ash from different steam electric generating units/hoppers to one common pond/impoundment, all associated conveyance equipment and pond/impoundment (and final transport/disposal, if applicable) should be considered/identified as one fly ash handling system.

- Include only fly ash handling systems that service at least one fossil-fueled steam electric generating unit. See Part A Section 8 for steam electric generating unit fuel classifications.
- For the "Type of Fly Ash Collection", only mark "Wet scrubber" if it is the ONLY means of collection. **Note: For any fly ash handling systems marked as "Wet scrubber", do NOT complete the remainder of Part C, Section 2 AND proceed to Part C, Section 3.**

- Provide the "Typical Amount of Fly Ash Produced in 2009 (Dry weight basis)" as tons of ash produced per day prior to sluicing from all steam electric generating units serviced by the fly ash handling system.

Table C-2. Fly Ash Handling Systems Operated in 2009

Fly Ash Handling System ID (FA-X)	Type of Fly Ash System	Type of Fly Ash Collection	Typical Amount of Fly Ash Produced in 2009 (Dry weight basis)	Design Ash Handling Rate (Dry weight basis)	Loss on Ignition of Fly Ash Produced (Provide typical range for 2009)	Class of Fly Ash Produced in 2009
EXAMPLE: *FA-EX*	Dry	○ ESP(s), dry, hot ◉ ESP(s), dry, cold ○ ESP(s), wet ○ Baghouse(s) (fabric ○ Wet scrubber(s) (○ Other:	*1,500* tpd *365* dpy	*2,000* tpd *365* dpy	*1* to *2* %	◉ Class C ○ Class I ○ Other:
FA-1	Select	○ ESP(s), dry, hot ○ ESP(s), dry, cold ○ ESP(s), wet ○ Baghouse(s) (fabric ○ Wet scrubber(s) (○ Other:	tpd dpy	tpd dpy	to %	○ Class C ○ Class I ○ Other:
FA-2	Select	○ ESP(s), dry, hot ○ ESP(s), dry, cold ○ ESP(s), wet ○ Baghouse(s) (fabric ○ Wet scrubber(s) (○ Other:	tpd dpy	tpd dpy	to %	○ Class C ○ Class I ○ Other:
FA-3	Select	○ ESP(s), dry, hot ○ ESP(s), dry, cold ○ ESP(s), wet ○ Baghouse(s) (fabric ○ Wet scrubber(s) (○ Other:	tpd dpy	tpd dpy	to %	○ Class C ○ Class I ○ Other:
FA-4	Select	○ ESP(s), dry, hot ○ ESP(s), dry, cold ○ ESP(s), wet ○ Baghouse(s) (fabric ○ Wet scrubber(s) (○ Other:	tpd dpy	tpd dpy	to %	○ Class C ○ Class I ○ Other:

FA-5	Select	◯ ESP(s), dry, hot ◯ ESP(s), dry, cold ◯ ESP(s), wet ◯ Baghouse(s) (fabric ◯ Wet scrubber(s) (◯ Other:	tpd dpy	tpd dpy	to %	◯ Class C ◯ Class ◯ Other:
FA-6	Select	◯ ESP(s), dry, hot ◯ ESP(s), dry, cold ◯ ESP(s), wet ◯ Baghouse(s) (fabric ◯ Wet scrubber(s) (◯ Other:	tpd dpy	tpd dpy	to %	◯ Class C ◯ Class ◯ Other:
FA-7	Select	◯ ESP(s), dry, hot ◯ ESP(s), dry, cold ◯ ESP(s), wet ◯ Baghouse(s) (fabric ◯ Wet scrubber(s) (◯ Other:	tpd dpy	tpd dpy	to %	◯ Class C ◯ Class ◯ Other:
FA-8	Select	◯ ESP(s), dry, hot ◯ ESP(s), dry, cold ◯ ESP(s), wet ◯ Baghouse(s) (fabric ◯ Wet scrubber(s) (◯ Other:	tpd dpy	tpd dpy	to %	◯ Class C ◯ Class ◯ Other:
FA-9	Select	◯ ESP(s), dry, hot ◯ ESP(s), dry, cold ◯ ESP(s), wet ◯ Baghouse(s) (fabric ◯ Wet scrubber(s) (◯ Other:	tpd dpy	tpd dpy	to %	◯ Class C ◯ Class ◯ Other:
FA-10	Select	◯ ESP(s), dry, hot ◯ ESP(s), dry, cold ◯ ESP(s), wet ◯ Baghouse(s) (fabric ◯ Wet scrubber(s) (◯ Other:	tpd dpy	tpd dpy	to %	◯ Class C ◯ Class ◯ Other:

Plant ID: Insert Pla
Plant Name: Insert Pla
SE Unit ID: Insert SE

Part: C
Section Title: 2.2. Fly Ash Handling - Unit Level Information

Instructions: Complete Section 2.2 (Questions C2-3 through C2-7) for each steam electric generating unit serviced in 2009 by a fly ash handling identified in Table C-2.

Make copies of Section 2.2 for each steam electric generating unit using the "Copy Section 2.2" button below. Enter the steam elec generating unit ID (use unit IDs assigned in Table A-8) in the space above titled "SE Unit ID".

Copy Section 2.2

CBI?
☐ Yes

C2-3. In Table C-3, indicate all of the fly ash handling systems that serviced the steam electric generating unit in 2009. Addtionally, provic percent of ash from the steam electric generating unit handled by each fly ash handling system, and the number of days each syste handled the ash in 2009. If the fly ash handling system can service the unit, but did not handle any of its ash in 2009, enter 0% and

Table C-3. Fly Ash Handling Systems Servicing the Steam Electric Generating Unit

Fly Ash Handling Systems Servicing the Steam Electric Generating Unit [Check all boxes that apply]	Percent of Ash Handled by the Fly Ash Handling System in 2009 (Dry weight basis)	Number of Days Ash was Handled by the Fly Ash Handling System in 2009
☐ FA-1	%	
☐ FA-2	%	
☐ FA-3	%	
☐ FA-4	%	
☐ FA-5	%	

☐ FA-6	%	
☐ FA-7	%	
☐ FA-8	%	
☐ FA-9	%	
☐ FA-10	%	

CBI?
☐ Yes

C2-4. Was the fly ash from this steam electric generating unit handled by both a *wet and dry fly ash handling system* in 2009?

○ Yes (Continue)

○ No (Skip to Section 2.3)

CBI?
☐ Yes

C2-5. If ash from the steam electric generating unit was handled by both wet and dry fly ash handling systems in 2009, indicate why. [Che
boxes that apply.] For each selection, identify the number of days in 2009 the wet system was operated for this reason.

☐ Wet fly ash handling system is operated during the times in which the dry collected fl

☐ Wet fly ash handling system is operated when the dry fly ash collection system is not operational due

☐ Wet fly ash handling system is operated in order to maintain its function as a backup to the dry system (i.e., wet system operated

☐ Wet fly ash handling system is operated because the dry fly ash handling system does not have the capacity to handle all o

☐ Other, explai

CBI?

☐ Yes

C2-6. If ash from the steam electric generating unit was handled by both a wet and dry fly ash handling systems in 2009, what modificatic be required to operate all the fly ash with the dry fly ash handling system? [Check all boxes that apply.]

- ☐ No system modifications necessary. Procedural changes would be sufficier
- ☐ Increase the capacity of the silo(s).
- ☐ Increase the number of silos.
- ☐ Modify the loading silos to have the ability to moisture condition the ash.
- ☐ Install/increase the capacity of landfills.
- ☐ Increase the capacity of the dry fly ash conveying equipment.
- ☐ Design/develop new infrastructure to dispose of dry ash. Specify new inf
- ☐ Other, expla

CBI?

☐ Yes

C2-7. If the current fly ash handling operations for the steam electric generating unit are expected to change in future years, indicate hov

- ◯ Decreased use of wet fly ash handling s
  Expected operating days per year for wet system
- ◯ End use of wet fly ash handling system.
  Expected end date
- ◯ No change expected in fly ash handling operations.
- ◯ Other, explain

Ash Handling

ant ID
ant Name
Unit ID

system

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days

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Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
Fly Ash Handling System ID: Insert System ID

Part: C
Section Title: 2.3. Dry Fly Ash Handling Information

Instructions: Make copies of Section 2.3 (Questions C2-8 through C2-23) for each *dry fly ash handling system* identified in Table C-2 using the "Copy Section 2.3" button below. Enter the fly ash handling system ID (use system IDs assigned in Table C-2) in the space above titled "Fly Ash Handling System ID".

Copy Section 2.3

CBI? ☐ Yes

C2-8. Indicate the type of the *dry fly ash handling system*.

- ◯ Vacuum syst
- ◯ Pressure sys
- ◯ Combined vacuum/pressure syste
- ◯ Mechanical system
- ◯ Other:

CBI? ☐ Yes

C2-9. Has the plant encountered any unscheduled generating unit outages caused by the dry fly ash handling system in the last five years?

- ◯ Yes ontinue)
- ◯ No ip to Question C2-11)

CBI? ☐ Yes

C2-10. In Table C-4, provide information on unscheduled generating unit outages caused by the dry fly ash handling system for each of the last five years.

Table C-4. Unscheduled Generating Unit Outages Caused by the Dry Fly Ash Handling System

	2005	2006	2007	2008	2009
Total days of outage					
Reason(s) for outage(s)					
Method(s) used to resolve outage(s)					

CBI? ☐ Yes

C2-11. Was the dry fly ash handling system installed as-is at the same time the oldest generating unit it services was built?

- ◯ Yes (Skip to Question C2-16)
- ◯ No, it was a re (Continue)

Year Built: _____

Shutdown time (days) required to bring dry fly ash handling system on line: _____

Was a generating unit outage(s), outside of regularly scheduled outages, required to bring the dry fly ash handling system on line?

- ◯ Yes
- ◯ No

CBI? ☐ Yes

C2-12. What type of retrofit was the dry fly ash handling system?

- ◯ The retrofit was made to an exis (Skip to Question C2-14)
- ◯ A dry fly ash handling system was installed (for operation in addition t (Continue)
- ◯ The retrofit was a complete conversion from a wet to dry fly ash h (Continue)

CBI? ☐ Yes

C2-13. Provide the reason(s) for the installation of the dry fly ash handling system or the complete conversion from the wet handling system to the dry handling system. [Check all boxes that apply.]

- ☐ The plant had issues meeting its ash *pond/impoundment* effluent permit limitations. Indicate for which *pollutant(s)*:
  - ☐ Hg
  - ☐ Se
  - ☐ As
  - ☐ Othe _____
- ☐ The plant switched to a low sulfur coal (e.g., PRB coal) that caused issues in the sluice piping used to convey wet fly ash to its ash pond(s)/impoundment(s), making dry fly ash handling more feasible from an operational/cost perspective.
- ☐ The plant identified markets for the dry-collected fly ash, providing an additional source of revenue.
- ☐ The plant had been approaching the limit of the capacity of the ash pond(s)/impoundment(s) used to store the ash.
- ☐ Other, explain: _____

CBI?
☐ Yes

C2-14. Provide the reason(s) for the retrofit to the existing dry handling system. [Check all boxes that apply.]

- ☐ Reason(s) for retrofit described as a wet to dry conversion in Question C2-13. Skip to Question C2-15.
- ☐ The plant decided to moisture-condition ash for transport/disposal.
- ☐ The plant wanted to increase the capacity of its dry fly ash handling system.
- ☐ The plant identified new markets for dry-collected fly ash.
- ☐ A higher demand from the plant's existing dry fly ash markets required increased capacity.
- ☐ Other, explain: _____

CBI?
☐ Yes

C2-15. Describe the changes that were required to retrofit (for a retrofit to an existing dry system, an installation of a dry system, or a complete conversion from wet to dry). [Check all boxes that apply.]

- ☐ Physical changes to facility
  - ☐ Installation of pressure/vacuum system and piping
  - ☐ Expansion of pressure/vacuum system and piping
  - ☐ Installation of storage silos
  - ☐ Modification of the silos to moisture-condition the ash
  - ☐ Modification of the silos for ash transfer to rail cars
  - ☐ Modification of the silos for marketable ash
  - ☐ Construction of haul roads
  - ☐ Construction of rail track
  - ☐ Construction of landfill. Provide the landfill ID(s) from Table A-6: _____
  - ☐ Increasing landfill capacity. Provide the landfill ID(s) from Table A-6: _____
  - ☐ Changes to air permit
  - ☐ Other, explain: _____
- ☐ Changes in personnel/training, explain: _____
- ☐ Changes in ash disposal practices
  - ☐ Storage of ash in landfills
  - ☐ Marketing of ash
  - ☐ Hauling ash to off-site storage
  - ☐ Dust suppression activities
  - ☐ Other, explain: _____

CBI?
☐ Yes

C2-16. Provide dry fly ash storage information in Table C-5, using the following definitions for "Storage Destination":

Storage Destination 1: The storage device that the fly ash immediately goes to from the fly ash collection equipment (i.e., baghouse or ESP).

Storage Destination 2: An additional storage step for the fly ash before end disposition. This row should only be completed if the ash does not reach end disposition after the first destination.

End (Final) Destination 3: The final storage destination of the ash. If the ash is deposited in more than one pond at the end disposition, provide an explanation on the Comments page.

For each storage destination, provide the distance the fly ash is transported, the amount of fly ash transported in 2009, and the percent moisture of the fly ash. Additionally, for each destination indicate how the fly ash is transported by entering one of the following options: conveyor belt/pipe, truck, barge, rail, or other (provide a description). If the fly ash is sold to more than one destination (e.g., some fly ash is sold for cement manufacturing and some is sold for structural fill) provide these percent moisture values in Table C-6 and enter the average percent moisture for all fly ash sold in Table C-5.

Table C-5. Dry Fly Ash Storage Information

Storage Destination	Type of Destination	Distance Transported (miles)	Tons of Fly Ash Transported to Destination in 2009 (dry weight basis)	How is Fly Ash Transported to Destination?	Percent Moisture of the Fly Ash Entering Destination
Storage Destination 1	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
Storage Destination 2	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
End (Final) Destination 3	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%

CBI? ☐ Yes

C2-17. Do you combine dry fly ash with *FGD solids* to form pozzolanic material?

○ Yes

○ No

CBI? ☐ Yes

C2-18. Does the plant market, sell, and/or give away dry fly ash from the dry ash handling system?

○ Yes (Continue)

○ No (Skip to Question C2-21)

CBI? ☐ Yes

C2-19. Complete Table C-6 if the plant markets, sells, and/or gives away dry fly ash from the fly ash handling system. For each destination, provide the tons of dry fly ash marketed, sold, and/or given away, the gross revenue generated from mareting/selling the dry fly ash for calendar years 2005, 2007, and 2009. Additionally, provide the typical percent moisture of the fly ash during calendar years 2005, 2007, and 2009. If the typical percent moisture of the fly ash was not constant during calendar years 2005, 2007, and 2009, note this information (include all typical percent moisture values for each year) in the Comments page.

Table C-6. Dry Fly Ash from the Fly Ash Handling System Marketed/Sold in Calendar Years 2005, 2007, and 2009

Destination	Typical Percent Moisture of Fly Ash	2005		2007		2009	
		Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $
Concrete/Concrete Products/Grout	%						
Blended Cement/Raw Feed for Clinker	%						
Flowable Fill	%						
Structural Fills/Embankments	%						
Road Base/Sub-base	%						
Soil Modification/ Stabilization	%						
Mineral Filler in Asphalt	%						
Snow and Ice Control	%						
Blasting Grit/Roofing Granules	%						
Mining Applications	%						

Waste Stabilization/ Solidification	%						
Agriculture	%						
Aggregate	%						
Other:	%						
Other:	%						

CBI? ☐ Yes

C2-20. What is the highest loss on ignition (LOI) at which dry fly ash from this fly ash handling system can still be marketed/sold?

CBI? ☐ Yes

C2-21. If water is used to moisten the fly ash, provide the source of the water used. [Check all boxes that apply.]

- ☐ Raw intake wa
- ☐ Intake water that has been treated on
- ☐ Select
- ☐ Select
- ☐ N/A: Fly ash is not moistened

CBI? ☐ Yes

C2-22. For water sources that may be used to moisten the fly ash (e.g., fresh intake, recycled process water), indicate the maximum chlorides concentration and maximum solids percentage that is acceptable for the water to be used. Identify any other criteria that the source water must meet. [Check all boxes that apply.]

- ☐ Chlorides concer ppm
- ☐ Solids percer %
- ☐ Othe
- ☐ N/A: Fly ash is not mo

CBI? ☐ Yes

C2-23. Indicate the criteria that the plant uses to determine if a water source is unacceptable for use (*recycle/reuse*) as *fly ash sluice* water. If the criteria are dictated by engineering design, provide specific elements of the design that dictate use.

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
Fly Ash Handling System ID: Insert System ID

Part: C
Section Title: 2.4. Wet Fly Ash Handling Information

Instructions: Make copies of Section 2.4 (Questions C2-24 through C2-36) for each *wet fly ash handling system* identified in Table C-2 using the "Copy Section 2.4" button below. Enter the fly ash handling system ID (use system IDs assigned in Table C-2) in the space above titled "Fly Ash Handling System ID".

Copy Section 2.4

CBI?
☐ Yes

C2-24. Provide information for the *wet fly ash handling system* in Table C-7. For the source of sluice water, you may enter more than one source from the following options:

- "IN" if *raw intake water* is used;
- "IN-Makeup" if raw intake water is only used as makeup;
- "TR" for use of *intake water* that has been *treated* on site prior to use;
- "TR-Makeup" if treated intake water is used only as makeup; and/or
- Process wastewater and/or treated wastewater described the code tables on the "Code Tables" tab provided at the end of this workbook

An example is provided in Table C-7 for a plant that uses the effluent from its ash pond (WWT-1, as would be defined in Part A) for fly ash sluicing and also makes up for losses with untreated river water (which is code IN-Makeup as shown above).

Table C-7. Process Wastewater Generated from Wet Fly Ash Handling Systems in 2009

Average Sluice Water Flow Rate (gpd)	Typical Duration AND Frequency of Sluicing (hpd AND dpy)	Source(s) of Sluice Water	Percent Contribution of Source to Sluice Water Flow
EXAMPLE:			
		WWT-1 Effluent	*90* %
14,400,000 gpd	*24* hpd	IN-Makeup	*10* %
	365 dpy	Combustion turbine cleaning (combustion gas por	%
		Other:	%

gpd	hpd	Select	%
	dpy	Select	%
		Select	%
		Other:	%
gpd	hpd	Select	%
	dpy	Select	%
		Select	%
		Other:	%

CBI?
☐ Yes

C2-25. Provide wet fly ash handling information in Table C-8, using the following definitions for column headings:

- Number of Dry-to-Wet Mixing Junctions: Indicate the number of "junctions" (also referred to as "separation points") where dry solids are sluiced.
- Distance(s) Between Hoppers and Dry-to-Wet Mixing Junction(s): Indicate the distance or distances (if there is more than one mixing junction) between the closest hopper(s) and the mixing junction(s).
- Distance Between Dry-to-Wet Junction(s) and Ash Pond or Other Final Destination: Indicate the distance(s) between the dry-to-wet mixing junction(s) and the final destination of the wet fly ash. Where one or more ponds are involved, indicate the distance to the end of the sluice pipe at the furthest ash pond.

Table C-8: Wet Fly Ash Handling in 2009

Number of Dry-to-Wet Mixing Junctions	Distance(s) Between Hoppers and Dry-to-Wet Mixing Junction(s)	Distance Between Dry-to-Wet Junction(s) and Ash Pond or Other Final Destination
EXAMPLE:		
	200 feet	*2,000* feet
2 junction(s)	*500* feet	*2,300* feet
	feet	feet
	feet	feet
	feet	feet
junction(s)	feet	feet
	feet	feet
	feet	feet
	feet	feet

CBI? ☐ Yes

C2-26. What is the destination(s) of the wet *fly ash sluice?* [Check all boxes that apply.]

☐ Immediately recycled back to plant process. Describe how the wet fly ash sluice is

☐ Transferred to on-site treatment system. Identify the type of treatment system belo

- ☐ Settling pond
- ☐ Constructed wetlan
- ☐ pH adjustment
- ☐ Other, spec
- ☐ Chemical precipi

☐ Discharged to surface water. Provide NPDES permitted outfall numbe

☐ Indirect discharge to a publicly or privately owned treatment works

☐ Other, expl

CBI? ☐ Yes

C2-27. For water sources that may be used as a source of *fly ash sluice* water (e.g., fresh intake, recycled process water), indicate the maximum chlorides concentration and the maximum solids percentage that is acceptable for the water to be used for those purposes. [Check all boxes that apply.]

☐	Chlorides concentration, less than:		ppm
☐	Solids percentage, less than:		ppm
☐	Other:	:	ppm

CBI? ☐ Yes

C2-28. Indicate the criteria that the plant uses to determine if a water source is unacceptable for use (*recycle/reuse*) as *fly ash sluice* water. If the criteria are dictated by engineering design, provide specific elements of the design that dictate use.

CBI? ☐ Yes

C2-29. Has the plant encountered any unscheduled generating unit outages caused by the wet fly ash handling system in the last five years?

○ Yes (Continue)

○ No (Skip to Question C2-31)

CBI? ☐ Yes

C2-30. Provide information on unscheduled generating unit outages caused by the wet fly ash handling system for each of the last five years.

Table C-9. Unscheduled Generating Unit Outages Caused by the Wet Fly Ash Handling System

	2005	2006	2007	2008	2009
Total days of outage					
Reason(s) for outage(s)					
Method(s) used to resolve outage(s)					

CBI? ☐ Yes

C2-31. Is the plant in the process of installing a dry fly ash handling system to handle some or all of the ash currently handled by the wet fly ash handling system?

◉ Yes Estimated shutdown time (days) required to bring dry fly ash handling system online: _____ (Skip to Question C2-33)

○ No (Continue to Question C2-32)

CBI?
☐ Yes

C2-32. Is the plant planning to install a dry fly ash handling system by December 31, 2020 to handle some or all of the ash currently handled by the wet fly ash handling system?

○ Yes — Estimated shutdown time (days) required to bring dry fly ash handling system online: _____ (Continue to Question C2-33)

◉ No — Skip to Question C2-35)

CBI?
☐ Yes

C2-33. Describe the modifications that will be required to install the dry fly ash handling system. [Check all boxes that apply.]

☐ Physical changes to facility
- ☐ Installation of pressure/vacuum system and piping
- ☐ Expansion of pressure/vacuum system and piping
- ☐ Installation of storage silos
- ☐ Modification of the silos to moisture-condition the ash
- ☐ Modification of the silos for ash transfer to railcars
- ☐ Modification of the silos for marketable ash
- ☐ Construction of haul roads
- ☐ Construction of rail track
- ☐ Construction of landfill
- ☐ Increasing landfill capacity
- ☐ Changes to air permit
- ☐ Other, explain: _____

☐ Changes in personnel/training, explain: _____

☐ Changes in ash disposal practices
- ☐ Storage of ash in landfill
- ☐ Marketing of ash
- ☐ Hauling ash to off-site storage
- ☐ Dust suppression activities
- ☐ Other, explain: _____

CBI?
☐ Yes

C2-34. Indicate the types of destinations expected for the dry fly ash from the planned system and the percentage of the dry fly ash that is expected to go to each destination. [Check all boxes that apply.]

☐ Marketed, sold, and/or given away
Select ____ % of the dry fly ash
If other, specify:
Select ____ % of the dry fly ash
If other, specify:
Select ____ % of the dry fly ash
If other, specify:

☐ Stored in landfills reported in Table A-6 ____ % of the dry fly ash

☐ Stored in landfills NOT reported in Table A-6 ____ % of the dry fly ash

☐ Other, specify: ____ % of the dry fly ash

CBI?
☐ Yes

C2-35. Complete Table C-10 if the plant currently markets, sells, and/or gives away fly ash transported by wet sluicing from the fly ash handling system. For each destination, provide the tons, on a dry basis, of fly ash transported by wet sluicing that is marketed, sold, and/or given away. Also provide the gross revenue generated from marketing/selling the fly ash transported by wet sluicing for each destination.

Table C-10. Fly Ash Transported by Wet Sluicing from the Fly Ash Handling System Marketed/Sold in Calendar Years 2005, 2007, and 2009

Destination	Typical Percent Moisture of Fly Ash	2005		2007		2009	
		Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $
Concrete/Concrete Products/Grout	%						
Blended Cement/Raw Feed for Clinker	%						
Flowable Fill	%						
Structural Fills/Embankments	%						

Road Base/Sub-base	%						
Soil Modification/Stabilization	%						
Mineral Filler in Asphalt	%						
Snow and Ice Control	%						
Blasting Grit/Roofing Granules	%						
Mining Applications	%						
Waste Stabilization/Solidification	%						
Agriculture	%						
Aggregate	%						
Other:	%						
Other:	%						

CBI?
☐ Yes

C2-36. If the plant is not in the process of installing or planning to install a dry fly ash handling system, has a conversion/installation ever been considered or have cost estimates been previously obtained/developed for such a conversion/installation?

◯ Yes (Provide documentation/costs, for example, bid proposals or internal plant engineering estimates.)

◯ No (Skip to Section 2.5)

Note: All bid proposals and/or other documentation/costs originally submitted to the plant as CBI, should be marked CBI for the purpose of this collection request.

◯ I have attached documentation/costs.

◯ I did not attach documentation/costs. Below, explair

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
Fly Ash Handling System ID: Insert System ID

Part: C
Section Title: 2.5. Fly Ash Cost Information - Conveyance

Instructions: Complete Section 2.5 (Questions C2-37 through C2-42) for the conveyance portion of each fly ash handling system (wet or dry) identified in Table C-2 that was installed after January 1, 1985. Enter the fly ash handling system ID in the space provided above (use the fly ash handling system IDs assigned in Table C-2).

If you indicated in Question C2-31or C2-32 that the plant is either installing or planning to install a dry fly ash handling system, complete Section 2.5, and enter "Planned" in the Fly Ash Handling System ID space provided above.

Make copies of Section 2.5 for each fly ash handling system operated in 2009, being installed, or planned to be installed by December 31, 2020 using the "Copy Section 2.5" button below.

The conveyance portion of the fly ash handling system refers to the part of the system that conveys fly ash from the fly ash collection equipment (ESP or baghouse) of one or more generating units to intermediate or final storage (e.g., storage silos or ponds/impoundments). Common dry fly ash conveyance components include filter/separators, vacuum/pressure transfer stations, blowers, and associated high pressure piping (note that conveyance does NOT include storage or loading silos). Common wet fly ash components include sluicing equipment, associated piping, and pumps (note that conveyance does NOT include ponds/impoundments).

Copy Section 2.5

CBI?
☐ Yes

C2-37. Identify all components of the conveyance portion of the fly ash handling system. Provide the type of component and the number or length (e.g., length of any necessary piping) of each type of component in the system. Additionally, provide the capacity of each component. For example, provide volume for silos, horsepower for pumps and diameter for piping.

Table C-11. Fly Ash System Components - Conveyance

Individual Components	Number or Length (ft) of Components in the System	Component Capacity
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select

Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	

CBI?

☐ Yes

C2-38. Attach a block diagram that shows the entire fly ash handling system operations. Label the conveyance, intermediate storage (see Part C Section 2.6) and transport/disposal (see Part C Section 2.7) portions of the system. The diagram should include all key components indicated in Tables C-11 and C-14 and identify all intermediate and final ash storage destinations. Indicate the movement of ash as well as water through the system. If ash from other fly ash or bottom ash handling systems is combined with ash from this fly ash handling system, indicate where the ash is combined and the ash handling systems involved. Provide as many diagrams as necessary to convey this information. Include the plant name, plant ID, and the fly ash handling system ID in the upper right hand corner of the diagram.

☐ Diagram attached

CBI?

☐ Yes

C2-39. List all of the major components of the conveyance portion of the fly ash handling system that a contractor(s) constructed/installed (or will construct/install, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL components identified in Tabl

CBI?

☐ Yes

C2-40. List all of the operation and maintenance activities of the conveyance portion of the fly ash handling system that a contractor(s) oversees (or will oversee, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL operation and maintenance activities dealing with the conveyance portion of the

CBI?

☐ Yes

C2-41. Provide cost data in Table C-12 for the conveyance portion of the fly ash handling system, both for the system as originally installed and for any modifications to the system. Include all conveyance costs including costs for components in Table C-11 as well as control systems, pads and foundations, and all other ancillary equipment. For planned fly ash handling systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the plant incurred a land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased and installed all equipment for the conveyance portion of the fly ash handling system at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-12. Capital Cost for the Conveyance Portion of the Fly Ash Handling System

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (including site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (including property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		
Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/or				
Construction expenses (including temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI?
☐ Yes

C2-42. Provide annual (2009) O&M costs data in Table C-13 for the conveyance portion of the fly ash handling system. Provide best engineering estimates when actual data are not readily available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates and maintains the conveyance component of the fly ash handling system at the contractor's expense, the plant should fill out "$ 0" for O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table C-12 "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-13. O&M Cost for the Conveyance Portion of the Fly Ash Handling System for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption
Operating Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Materials	$		
Energy	$	$ per kWh	kWh/hr
Other:	$		
Other:	$		
Total O&M Cost (2009)	$		

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
Fly Ash Handling System ID: Insert System ID

Part: C
Section Title: 2.6. Fly Ash Cost Information - Intermediate Storage

Instructions: Complete Section 2.6 (Questions C2-43 through C2-51) for the intermediate storage portion of each fly ash handling system identified in Table C-2 that was installed after January 1, 1985. Enter the fly ash handling system ID in the space provided above (use the fly ash handling system IDs assigned in Table C-2).

If you indicated in Question C2-31 or C2-32 that the plant is either installing or planning to install a dry fly ash handling system, complete Section 2.6, and enter "Planned" in the Fly Ash Handling System ID space provided above.

Make copies of Section 2.6 for each fly ash handling system operated in 2009, being installed, or planned to be installed by December 31, 2020 using the "Copy Section 2.6" button below.

If you are instructed to skip forward to another section while completing this section for one fly ash handling system, be sure to complete this section for each other fly ash handling system operated in 2009, being installed, or planned to be installed by December 31, 2020.

The intermediate storage portion of the fly ash handling system refers to the facility/site where collected fly ash is stored after conveyance, prior to the ash being transported to final disposal. Dry fly ash intermediate storage typically consists of storage silos. Wet fly ash intermediate storage typically consists of ponds/impoundments.

Note that intermediate storage includes all equipment and operations associated with loading dry or moisture-conditioned ash into trucks or rail cars for transport. Intermediate storage also includes all ash dust suppression activities at the plant.

Copy Section 2.6

CBI? ☐ Yes

C2-43. Does the fly ash handling system use (or will it use, for planned systems) an intermediate storage facility/site?

- ◯ Yes (Continue)
- ◯ No (Skip to Section 2.7)

CBI? ☐ Yes

C2-44. Does the fly ash handling system share any intermediate storage components with another fly ash handling system or with a bottom ash handling system? For example, if fly ash and bottom ash are conveyed separately but stored in a common silo, the silo is considered a shared component.

- ◯ Yes, all intermediate storage components are shared with one or more other fly ash handling systems (e.g., all ash fr
  Provide fly ash handling system IDs, as assigned in Table C-2, for all systems sharing components _____ (Continue)
- ◯ Yes, some intermediate storage components are shared with one or more other fly ash handling systems (e.g., multiple silos are used to st
  Provide fly ash handling system IDs, as assigned in Table C-2, for all systems sharing components _____
  Indicate which components are shared _____ (Continue)
- ◯ Yes, some or all intermediate storage components are shared with one or m
  Provide bottom ash handling system IDs, as assigned in Table C-19, for all systems sharing components _____ (Skip to Section 2.7)
- ◯ No (Continue)

CBI? ☐ Yes

C2-45. Is a *pond/impoundment* unit or *pond/impoundment system* the intermediate storage site of the ash collected by the fly ash handling system?

◯ Yes (Skip to Section 3.1)

◯ No (Continue)

CBI? ☐ Yes

C2-46. Has cost information for the intermediate storage portion of the fly ash handling system already been provided in the cost information for another fly ash handling system?

◯ Yes, costs for all intermediate storage components of the fly ash handling syste

Indicate which fly ash handling system's intermediate storage cost information includes these costs (Skip to Section 2.7)

◯ Yes, costs for some intermediate storage components of the fly ash handlir

Indicate which fly ash handling system's intermediate storage cost information includes these costs

Estimate the capital costs associated with the shared intermediate storage components

Estimate the O&M costs associated with the shared intermediate storage components (Continue)

◯ No e)

CBI? ☐ Yes

C2-47. Identify all components, both separate and shared, of the intermediate storage portion of the fly ash handling system. Provide the type of component and the number of each type of component in the system. Additionally provide the capacity of each component, for example, provide volume for silos.

Table C-14. Fly Ash Handling System Components - Intermediate Storage

Individual Components		Number of Components in the System	Component Size	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	

Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	

CBI?
☐ Yes

C2-48. List all of the major components of the intermediate storage portion of the fly ash handling system that a contractor(s) constructed/installed (or will construct/install, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL components identified inTab

CBI?
☐ Yes

C2-49. List all of the operation and maintenance activities of the intermediate storage portion of the fly ash handling system that a contractor(s) oversees (or will oversee, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL operation and maintenance activities dealing with the intermediate storage portion of th

CBI?
☐ Yes

C2-50. Provide cost data in Table C-15 for the intermediate storage portion of the fly ash handling system, both for the system as originally installed and for any modifications to the system. Include all intermediate storage costs including costs for components in Table C-14 as well as control systems, pads and foundations, and all other ancillary equipment. For planned fly ash handling systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the plant incurred a land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased and installed all the equipment for the intermediate storage portion of the fly ash handling system at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-15. Capital Cost for the Intermediate Storage Portion of the Fly Ash Handling System

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (includes site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (includes property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		

Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/o				
Construction expenses (including temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI?
☐ Yes

C2-51. Provide annual O&M costs data in Table C-16 for the intermediate storage portion of the fly ash handling system. Provide best engineering estimates when actual data are not readily available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates and maintains the intermediate storage portion of the fly ash handling system at the contractor's expense, the plant should fill out "$ 0" for O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table C-15 "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-16. O&M Cost for the Intermediate Storage Portion of the Fly Ash Handling System for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption
Operating Labor (Water Trucks Only)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Operating Labor (All other operating costs)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Materials	$		
Energy	$	$ per kWh	kWh/hr
Other:	$		
Other:	$		
Total O&M Cost (2009)	$		

Plant ID:
Plant Name:
Fly Ash Handling System ID:

Part: C
Section Title: 2.7. Fly Ash Cost Information - Transport/Disposal

Instructions: Complete Section 2.7 (Questions C2-52 through C2-59) for the ash transport/disposal portion of each fly ash handling system identified in Table C-2 that was installed after
Enter the fly ash handling system ID in the space provided above (use the fly ash handling system IDs assigned in Table C-2).

If you indicated in Question C2-31 or C2-32 that the plant is either installing or planning to install a dry fly ash handling system, complete Section 2.7, and enter "Planned" ir
Handling System ID space provided above.

Make copies of Section 2.7 for each fly ash handling system operated in 2009, being installed, or planned to be installed by December 31, 2020 using the "Copy Section 2.7

If you are instructed to skip forward to another section while completing this section for one fly ash handling system, be sure to complete this section for each other fly ash h
operated in 2009, being installed, or planned to be installed by December 31, 2020.

The ash transport/disposal portion of the fly ash handling system refers to the transportation of ash from intermediate storage to final disposal.

An example of ash transport/disposal is transportation used to haul ash off site (e.g., ash that is marketed and shipped off site to a reuse application). Ash transport typically
consists of roads and vehicles that are used to transport the ash. The capital and O&M costs for ash transport/disposal may include the road or rail infrastructure (roads,
tracks, lights), the trucks and rail cars, the operation and maintenance costs associated with the trucks and rail cars, and ash disposal fees.

Note that capital and operation and maintenance costs associated with landfills/landfilling are requested in Part F and they should not be provided here in Section 2.7.

Copy Section 2.7

CBI?
☐ Yes

C2-52. Does the fly ash handling system share any transport/disposal components with another fly ash handling system or with a bottom ash handling system? For example, if fly a
are transported using the same trucks, the trucks are considered a shared component.

◯ Yes, all transport/disposal components are shared with one or more other fly ash handling systems (e.g., all
Provide fly ash handling system IDs, as assigned in Table C-2, for all systems sharing components _____ (Continue)

◯ Yes, some transport/disposal components are shared with one or more other fly ash handling syster
Provide fly ash handling system IDs, as assigned in Table C-2, for all systems sharing components _____
Indicate which components are shared _____ (Continue)

◯ Yes, some or all transport/disposal components are shared with one or more
Provide bottom ash handling system IDs, as assigned in Table C-19, for all systems sharing components _____ (Skip to Section

◯ No (Continue)

CBI?
☐ Yes

C2-53. Is a *pond/impoundment* unit or *pond/impoundment system* the final destination of the ash collected by the fly ash handling system?

◯ Yes (Skip to Section 3.1)

◯ No (Continue)

CBI?
☐ Yes

C2-54. Has cost information for the transport/disposal portion of the fly ash handling system already been provided in the cost information for another fly ash handling system?

○ Yes, costs for all transport/disposal components of the fly ash handling system have already been provided

Indicate which fly ash handling system's transport/disposal cost information includes these costs _____ (Skip to Section

○ Yes, costs for some transport/disposal components of the fly ash handling systems have already be

Indicate which fly ash handling system's transport/disposal cost information includes these costs _____

Estimate the capital costs associated with the shared transport/disposal components except for landfills _____

Estimate the O&M costs associated with the shared transport/disposal components except for landfills _____ (Continue)

○ No (Continue)

CBI?
☐ Yes

C2-55. What methods are used to transport the collected fly ash to the final disposal? [Check all boxes that apply.]

☐ Trucks

How many trucks does the plant use for the transportation and disposal of dry fly ash?

_____

Indicate whether the trucks were bought, leased or contracted out.

☐ Bought
☐ Leased
☐ Contracted out

☐ Rail ca

How many rail cars does the plant use for the transportation and disposal of dry fly ash?

_____

Indicate whether the rail cars were bought, leased or contracted out.

☐ Bought
☐ Leased
☐ Contracted out

☐ Other, specify (e. _____

CBI?
☐ Yes

C2-56. List all of the major components of the transport/disposal portion of the fly ash handling system that a contractor(s) constructed/installed (or will construct/install, for planned contractor's expense (i.e., not at the plant's expense).

_____

☐ Contractor installed/will install ALL ash transport/disposal equipment and/or infrastru

CBI?
☐ Yes

C2-57. List all of the operation and maintenance activities of the transport/disposal portion of the fly ash handling system that a contractor(s) oversees (or will oversee, for planned contractor's expense (i.e., not at the plant's expense).

_____

☐ Contractor oversees/will oversee ALL transport/disposal activities at the contractor's expense.

CBI?
☐ Yes

C2-58. Provide cost data in Table C-17 for the transport/disposal of the collected fly ash, both for the system as originally installed and for any modifications to the system. Include transport/disposal costs including costs for components in Table C-16 as well as control systems, pads and foundations, and all other ancillary equipment. For planned fly a systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note that capital costs associated with *landfills*/landfilling are requested in Part F. Do NOT include landfill costs in Table C-17.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased all rail cars and/or trucks fo transportation of the fly ash at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-17. Capital Cost for the Transport/Disposal of Collected Fly Ash

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (including site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (includes property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		

Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below:				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/or				
Construction expenses (includes temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI?
☐ Yes

C2-59. Provide annual O&M costs data in Table C-18 for the transport/disposal of the collected fly ash. Provide best engineering estimates when actual data are not readily availab an estimate, note the methods that were used to make the estimates in the Comments page.

Note that O&M costs associated with *landfills*/landfilling are requested in Part F. Do NOT include landfill costs in Table C-18.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates the transportation and dispo the contractor's expense, the plant should fill out "$ 0" for the cost of all operating O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-18. O&M Cost for the Transport/Disposal Portion of the Fly Ash Handling System for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption	Tran
Operating Labor (Trucks/Rail Cars/Other Transport)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Operating Labor (All other operating costs)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Maintenance Materials	$			
Energy	$	$ per kWh	kWh/hr	
Ash Removal/Disposal Fees	$			
Other:	$			
Other:	$			
Total O&M Cost (2009)	$			

Insert Plant ID
Insert Plant Name
Insert System ID

· January 1, 1985.

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Loads per day dpy

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name

Part: C
Section Title: 3.1. Bottom Ash Handling - System Level Information

Instructions: Throughout Section 3.1 (Questions C3-1 and C3-2), provide ash handling information for each bottom ash handling system, operated at any time in 2009, including systems that may have been idle for an extended period of time, that service at least one fossil-fueled steam electric generating unit.

CBI? ☐ Yes

C3-1. Is bottom ash generated in any fossil-fueled steam electric generating units at the plant? See Part A Section 8 for steam electric generating unit fuel classifications.

○ Yes (Continue)
○ No (Skip to Section 4.1)

CBI? ☐ Yes

C3-2. Provide bottom ash handling information in Table C-19, following these instructions:.

- Provide information at the bottom ash handling system level. For the purpose of this questionnaire, bottom ash handling systems include all components associated with the conveyance of bottom ash from the boilers, intermediate storage of the bottom ash, and transport/disposal of bottom ash (i.e., all components from boilers to final bottom ash disposition). As an example, if multiple pipes are used to sluice bottom ash from different steam electric generating units/boilers to one common pond/impoundment, all associated conveyance equipment and pond/impoundment (and final transport/disposal, if applicable) should be considered/identified as one bottom ash handling system.
- Include only bottom ash handling systems that service at least one fossil-fueled steam electric generating unit. See Part A Section 8 for steam electric generating unit fuel classifications.
- Refer to the glossary and the "Part C Instructions" tab for definitions related to wet and dry bottom ash handling systems.

Table C-19. Bottom Ash Handling Systems Operating in 2009

Bottom Ash Handling System ID (BA-X)	Type of Bottom Ash Handling System	Typical Amount of Bottom Ash Produced in 2009 (Dry weight basis)	Typical Percent Moisture of Bottom Ash in 2009	Design Ash Handling Rate (Dry weight basis)	Loss on Ignition of Bottom Ash Produced (Provide Typical Range for 2009 if Monitored)
EXAMPLE:					
BA-EX	Wet	*1,500* tpd *365* dpy	*18* %	*2,000* tpd *365* dpy	*1* to *2* % ☐ Not monitc
BA-1	Select	tpd dpy	%	tpd dpy	to % ☐ Not monitc
BA-2	Select	tpd dpy	%	tpd dpy	to % ☐ Not monitc

					☐ Not monitc
BA-3	Select	tpd dpy	%	tpd dpy	to % ☐ Not monitc
BA-4	Select	tpd dpy	%	tpd dpy	to % ☐ Not monitc
BA-5	Select	tpd dpy	%	tpd dpy	to % ☐ Not monitc
BA-6	Select	tpd dpy	%	tpd dpy	to % ☐ Not monitc
BA-7	Select	tpd dpy	%	tpd dpy	to % ☐ Not monitc
BA-8	Select	tpd dpy	%	tpd dpy	to % ☐ Not monitc
BA-9	Select	tpd dpy	%	tpd dpy	to % ☐ Not monitc
BA-10	Select	tpd dpy	%	tpd dpy	to % ☐ Not monitc

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
SE Unit ID: Insert SE Unit ID

Part: C
Section Title: 3.2. Bottom Ash Handling - Unit Level Information

Instructions: Complete Section 3.2 (Questions C3-3 through C3-8) for each steam electric generating unit serviced in 2009 by a bottom ash handling system identified in Table C-19.

Make copies of Section 3.2 for each steam electric generating unit using the "Copy Section 3.2" button below. Enter the steam electric generating unit ID (use unit IDs assigned in Table A-8) in the space above titled "SE Unit ID".

Copy Section 3.2

CBI? ☐ Yes

C3-3. Indicate whether a *wet-bottom boiler* or a *dry-bottom boiler* is used in the steam electric generating unit.

◯ Wet-bottom bo
◯ Dry-bottom bo

CBI? ☐ Yes

C3-4. In Table C-20, indicate all of the bottom ash handling systems that serviced the steam electric generating unit in 2009. Addtionally, provide the percent of ash from the steam electric generating unit handled by each bottom ash handling system, and the number of days each system handled the ash in 2009. If the bottom ash handling system can service the unit, but did not handle any of its ash in 2009, enter 0% and 0 days.

Table C-20. Bottom Ash Handling Systems Servicing the Steam Electric Generating Unit

Bottom Ash Handling Systems Servicing the Steam Electric Generating Unit [Check all boxes that apply]	Percent of Ash Handled by the Bottom Ash Handling System in 2009 (Dry weight basis)	Number of Days Ash Handled by the Bottom Ash Handling System in 2009
☐ BA-1	%	
☐ BA-2	%	
☐ BA-3	%	
☐ BA-4	%	

☐ BA-5	%	
☐ BA-6	%	
☐ BA-7	%	
☐ BA-8	%	
☐ BA-9	%	
☐ BA-10	%	

CBI?
☐ Yes

C3-5. Was the bottom ash from this steam electric generating unit handled by both a *wet and dry bottom ash handling system* in 2009?

○ Yes (Continue)
○ No (Skip to Section 3.3)

CBI?
☐ Yes

C3-6. If ash from the steam electric generating unit was handled by both a wet and dry bottom ash handling systems in 2009, indicate why. [Check all boxes that apply.] For each selection, identify the number of days in 2009 the wet system was operated for this reason.

☐ Wet bottom ash handling system is operated during the times in which the dry collected bot ____ days
☐ Wet bottom ash handling system is operated when the dry bottom ash collection system is not opera ____ days
☐ Wet bottom ash handling system is operated in order to maintain its function as a backup to the dry system (i.e., wet system c ____ days
☐ Wet bottom ash handling system is operated because the dry bottom ash handling system does not have the capac ____ days
☐ Other, expla _____ ____ days

CBI?
☐ Yes

C3-7. If ash from the steam electric generating unit was handled by both a wet and dry bottom ash handling systems in 2009, what modifications would be required to operate all the bottom ash with the dry bottom ash handling system? [Check all boxes that apply.]

☐ No system modifications necessary. Procedural changes would be suf
☐ Increase the capacity of the silo(s).
☐ Increase the number of silos.
☐ Modify the loading silos to have the ability to moisture condition the
☐ Install/increase the capacity of landfills.
☐ Increase the capacity of the dry bottom ash conveying equipment.

☐ Design/develop new infrastructure to dispose of dry ash. Specify the new

☐ Other, expl

CBI?
☐ Yes

C3-8. If the current bottom ash handling operations for the steam electric generating unit are expected to change in future years, indicate how.

◯ Decrease the use of wet bottom ash handling s
Expected operating days per year

◯ End use of wet bottom ash handling system.
Expected end date

◯ No change in bottom ash handling operations.

◯ Other, explai

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
Bottom Ash Handling System ID: Insert System ID

Part: C
Section Title: 3.3. Dry Bottom Ash Handling Information

Instructions: Make copies of Section 3.3 (C3-9 through C3-20) for each *dry bottom ash handling system* identified in Table C-19 using the "Copy Section 3.3" button below. Enter the bottom ash handling system ID (use system IDs assigned in Table C-19) in the space above titled "Bottom Ash Handling System ID".

Copy Section 3.3

CBI? ☐ Yes

C3-9. Does the plant use a mechanical drag system (e.g., submerged chain conveyor (SCC)) to remove bottom ash from the generating unit boiler(s)?

◯ Yes (Skip to Question C3-10)
◯ No (Continue)

Name the type and describe the process of removing bottom ash from the generating unit boiler(s).

CBI? ☐ Yes

C3-10. Has the plant encountered any unscheduled generating unit outages caused by the dry bottom ash handling system in the last five years (e.g., submerged chain conveyor (SCC) system needed to be repaired due to falling boiler slag)?

◯ Yes ontinue)
◯ No (Skip to Question C3-12)

CBI? ☐ Yes

C3-11. In Table C-21, provide information on unscheduled generating unit outages caused by the dry bottom ash handling system for each of the last five years.

Table C-21. Unscheduled Generating Unit Outages Caused by the Dry Bottom Ash Handling System

	2005	2006	2007	2008	2009
Total days of outage					
Reason(s) for outage(s)					
Method(s) used to resolve outage(s)					

CBI? ☐ Yes

C3-12. Was the dry bottom ash handling system installed as-is at the same time the oldest generating unit it services was built?

- ◯ Yes (Skip to Question C3-18)
- ◯ No, it was a r (Continue)

Year Built: _____

Shutdown time (days) required to bring dry bottom ash handling system on line: _____

Was a generating unit outage(s), outside of regularly scheduled outages, required to bring the dry bottom ash handling system on line?

- ◯ Yes
- ◯ No

CBI? ☐ Yes

C3-13. What type of retrofit was the dry bottom ash handling system?

- ◯ The retrofit was made to an exi (Skip to Question C3-15)
- ◯ A dry bottom ash handling system was installed (for operation in additior (Continue)
- ◯ The retrofit was a complete conversion from a wet to dry bottor (Continue)

CBI? ☐ Yes

C3-14. Provide the reason(s) for the installation of the dry bottom ash handling system or the complete conversion from the wet handling system to the dry handling system. [Check all boxes that apply.]

☐ The plant had issues meeting its ash *pond/impoundment* effluent permit limitations.

Indicate which *pollutant(s)*:

- ☐ Hg
- ☐ Se
- ☐ As
- ☐ Othe _____

☐ The plant switched to a low sulfur coal (e.g., PRB coal) which caused issues in the sluice piping used to convey wet bottom ash to its ash pond(s), making dry bottom ash handling more feasible from an operational/cost perspective.

☐ The plant identified markets (housing/construction) for the dry-collected bottom ash, providing an additional source of revenue.

☐ The plant had been approaching the limit of the capacity of the ash pond(s)/impoundment(s) used to store the ash.

☐ Other, explain: _____

CBI? ☐ Yes

C3-15. Provide the reason(s) for the retrofit to the existing dry handling system. [Check all boxes that apply.]

- ☐ Reason(s) for retrofit described as a wet to dry conversion in Question C3-14. Skip to Question C3-16.
- ☐ The plant decided to moisture condition ash for transport/disposal.
- ☐ The plant had to install unloading equipment for marketable dry bottom ash.
- ☐ The plant wanted to increase the capacity of its dry bottom ash handling system.
- ☐ The plant identified new markets for dry-collected bottom ash.
- ☐ The demand from the plant's existing markets for the dry-collected bottom ash grew.
- ☐ Other, explain:

CBI? ☐ Yes

C3-16. Describe the changes that were required to retrofit (for a retrofit to an existing dry system, an installation of a dry system, or a complete conversion from wet to dry). [Check all boxes that apply.]

- ☐ Physical changes to facility
  - ☐ Installation of mechanical drag system
  - ☐ Boiler alteration to accommodate the mechanical drag system
  - ☐ Installation of completely dry bottom ash handling system
  - ☐ Installation of storage silos
  - ☐ Modification of the silos to moisture-condition the ash
  - ☐ Modification of the silos for ash transfer to rail cars
  - ☐ Modification of the silos for marketable ash
  - ☐ Construction of haul roads
  - ☐ Construction of rail track
  - ☐ Construction of landfill. Provide the landfill ID(s) from Table A-6:
  - ☐ Increasing landfill capacity. Provide the landfill ID(s) from Table A-6:
  - ☐ Changes to air permit
  - ☐ Other, explain:
- ☐ Changes in personnel/training,explain:
- ☐ Changes in ash disposal practices
  - ☐ Storage of ash in landfill
  - ☐ Marketing of ash
  - ☐ Hauling ash to off-site storage
  - ☐ Dust suppression activities
  - ☐ Other, explain:

CBI? ☐ Yes

C3-17. Attach an engineering process diagram(s) for the dry bottom ash handling system retrofit that depicts (with dimensions) the conveyance portion of the system (e.g., a diagram(s) that depicts how the dry bottom ash system is configured within the building to convey bottom ash from the boiler(s) to the building exit).

☐ Diagram attache

CBI?
☐ Yes

C3-18. Provide dry bottom ash storage information in Table C-22, using the following definitions for "Storage Destination":

Storage Destination 1: The storage device that the bottom ash immediately goes to from the bottom ash collection system (i.e., baghouse or ESP).

Storage Destination 2: An additional storage step for the bottom ash before end disposition. This row should only be completed if the ash does not reach end disposition after the first destination.

End (Final) Destination 3: The final storage destination of the ash. If the ash is deposited in more than one pond at the end disposition, provide an explanation on the Comments page.

For each storage destination, provide the distance the bottom ash is transported, the amount of bottom ash transported in 2009 (dry basis), and the percent moisture of the bottom ash. Additionally, for each destination indicate how the bottom ash is transported by entering one of the following options: conveyor belt/pipe, truck, barge, rail, or other (provide a description). If the bottom ash is sold to more than one destination (e.g., some bottom ash is sold for cement manufacturing and some is sold for structural fill) provide these percent moisture values in Table C-19 and enter the average percent moisture for all bottom ash sold in Table C-20.

Table C-22. Dry Bottom Ash Storage Information

Storage Destination	Type of Destination	Distance Transported (miles)	Tons of Bottom Ash Transported to Destination in 2009 (dry weight basis)	How is Bottom Ash Transported to Destination?	Percent Moisture of the Bottom Ash Entering Destination
Storage Destination 1	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
Storage Destination 2	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
End (Final) Destination 3	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%

CBI?
☐ Yes

C3-19. Does the plant market, sell, and/or give away dry bottom ash from the dry ash handling system?

◯ Yes (Continue)

◯ No (Skip to Section 3.4)

CBI?
☐ Yes

C3-20. Complete Table C-23 if the plant markets, sells, and/or gives away dry bottom ash from the bottom ash handling system. For each destination, provide the tons of dry bottom ash marketed, sold, and/or given away, the gross revenue generated from mareting/selling the dry bottom ash for calendar years 2005, 2007, and 2009. Additionally, provide the typical percent moisture of the bottom ash during calendar years 2005, 2007, and 2009. If the typical percent moisture of the bottom ash was not constant during calendar years 2005, 2007, and 2009, note this information (include all typical percent moisture values for each year) in the Comments page.

Table C-23. Dry Bottom Ash from the Bottom Ash Handling System Marketed/Sold in Calendar Years 2005, 2007, and 2009

Destination	Typical Percent Moisture of Bottom Ash	2005		2007		2009	
		Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $
Concrete/Concrete Products/Grout	%						
Blended Cement/Raw Feed for Clinker	%						
Flowable Fill	%						
Structural Fills/Embankments	%						
Road Base/Sub-base	%						
Soil Modification/Stabilization	%						
Mineral Filler in Asphalt	%						
Snow and Ice Control	%						
Blasting Grit/Roofing Granules	%						
Mining Applications	%						
Waste Stabilization/Solidification	%						
Agriculture	%						
Aggregate	%						
Other:	%						
Other:	%						

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
Bottom Ash Handling System ID: Insert System ID

Part: C
Section Title: 3.4. Wet Bottom Ash Handling Information

Instructions: Make copies of Section 3.4 (Questions C3-21 through C3-36) for each *wet bottom ash handling system* identified in Table C-19 using the "Copy Section 3.4" button below. Enter the bottom ash handling system ID (use system IDs assigned in Table C-19) in the space above titled "Bottom Ash Handling System ID".

Copy Section 3.4

CBI? ☐ Ye

C3-21. Provide information for the wet bottom ash handling system in Table C-24. For the source of sluice water, you may enter more than one source from the following options:

- "IN" if *raw intake water* is used;
- "IN-Makeup" if raw intake water is only used as makeup;
- "TR" for use of *intake water* that has been *treated* on site prior to use;
- "TR-Makeup" if treated intake water is used only as makeup; and/or
- *Process wastewater* and/or treated wastewater described in the code tables on the "Code Tables" tab provided at the end of this workbook

An example is provided in Table C-24 for a plant that uses the effluent from its ash pond (WWT-1, as would be defined in Part A) for bottom ash sluicing and also makes up for losses with untreated river water (which is code IN-Makeup as shown above).

Table C-24. Process Wastewater Generated from Wet Bottom Ash Handling Systems in 2009

Average Sluice Water Flow Rate (gpd)	Typical Duration AND Frequency of Sluicing (hpd AND dpy)	Source(s) of Sluice Water	Percent Contribution of Source to Sluice Water Flow
EXAMPLE:			
14,400,000 gpd	*24* hpd *365* dpy	WWT-1 Effluent IN-Makeup Select Other:	*90* % *10* % % %
gpd	hpd dpy	Select Select Select Other:	% % % % % % % %
gpd	hpd dpy	Select Select Select Other:	% % % % % % % %

CBI? ☐ Ye

C3-22. For water sources that may be used as a source of *bottom ash sluice* water (e.g., fresh intake, recycled process water), indicate the maximum chlorides concentration and the maximum solids percentage that is acceptable for the water to be used for those purposes. [Check all boxes that apply.]

☐ Chlorides concentration, less than: _____ ppm
☐ Solids percentage, less than: _____ ppm
☐ Other: _____ : _____ ppm

CBI? ☐ Ye

C3-23. Indicate the criteria that the plant uses to determine if a water source is unacceptable for use *(recycle/reuse)* as *bottom ash sluice* water. If the criteria are dictated by engineering design, provide specific elements of the design that dictate use.

_____

CBI? ☐ Ye

C3-24. Does solids removal (other than in pond(s)/impoundment(s)) occur at the plant?

◯ Yes (Skip to Question C3-26)
◯ No (Continue)

CBI? ☐ Ye

C3-25. Provide the destination(s) of the wet *bottom ash sluice* below [check all boxes that apply], and then skip to Question C3-29. (Skip to Question C3-29)

☐ Immediately recycled back to plant process. Describe how the we
_____
☐ Transferred to on-site treatment system. Identify the type of treatr
☐ Settling pond ☐ Constructed w
☐ pH adjustment ☐ Other, s _____
☐ Chemical pre
☐ Discharged to surface water. Provide NPDES permittec _____
☐ Indirect discharge to a publicly or privately owned tre
☐ Other, e _____

CBI? ☐ Ye

C3-26. In Table C-25 provide solids removal information, on a dry ton basis, for the wet ash sluice system. For the purpose of Table C-25, solids removal does NOT include ash ponds.

Table C-25. Wet Ash Sluice Systems Operated in 2009

Solids Removal [Check all boxes that apply]	Bottom Ash Disposal [Check all boxes that apply]	Amount (tons) of Solids Disposed (Dry weight basis)	Typical Percent Moisture of Bottom Ash Disposed
☐ Dewatering bin	☐ Sold or given away witho	_____ tons	_____ %
☐ Hydrocyclone	☐ Sold or given away after	_____ tons	_____ %
☐ Centrifug	☐ Stored in/transferred to a pond/impou	_____ tons	_____ %
☐ Filters	☐ Stored in landfills reportec	_____ tons	_____ %
☐ Othe _____	☐ Stored in landfills NOT reported in Table A-6	_____ tons	_____ %
	☐ Othe _____	_____ tons	_____ %

CBI? ☐ Ye

C3-27. Provide the amount of wastewater overflow from solids removal (e.g., dewatering bins) for the wet ash sluice system.

_____ gpd

CBI? ☐ Ye

C3-28. What is the destination(s) of the wastewater overflow from solids removal? If the plant recycles the wastewater, indicate the amount and the plant process to which this waste is recycled. [Check all boxes that apply.]

☐ Immediately recycled back to plant process.

Provide the amount of wastewater overflow that is recycled.

_____ gpd

Describe how the wastewater overflow is reused:

_____

☐ Transferred to on-site treatment system. Identify the type of treatr

☐ Settling pond ☐ Constructed w

☐ pH adjustment ☐ Other, s _____

☐ Discharged to surface water. Provide NPDES permittec _____

☐ Indirect discharge to a publicly or privately owned tre

☐ Other, e _____

CBI? ☐ Ye

C3-29. Has the plant encountered any unscheduled generating unit outages caused by the wet bottom ash handling system in the last five years?

◯ Yes (Continue)

◯ Nc (Skip to Question C3-31)

CBI? ☐ Ye

C3-30. In Table C-26, provide information on unscheduled generating unit outages caused by the wet bottom ash handling system for each of the last five years.

Table C-26. Unscheduled Generating Unit Outages Caused by the Wet Bottom Ash Handling System

	2005	2006	2007	2008	2009
Total days of outage					
Reason(s) for outage(s)					
Method(s) used to resolve outage(s)					

CBI? ☐ Ye

C3-31. Is the plant in the process of installing a dry bottom ash handling system to handle some or all of the ash currently handled by the wet bottom ash handling system?

◯ Yes ;timated shutdown time (days) required to bring dry bottom ash handling system online: _____ (Skip to Question C3-33)

◯ No ontinue to Question C3-32)

CBI? ☐ Ye

C3-32. Is the plant planning to install a dry bottom ash handling system to handle some or all of the ash currently handled by the wet bottom ash handling system?

○ Yes Estimated shutdown time (days) required to bring dry bottom ash handling system online: _____ (Continue to Question C3-33)

○ No (Skip to Question C3-35)

CBI? ☐ Ye

C3-33. Describe the modifications that will be required to install the dry bottom ash handling system. [Check all boxes that apply.]

☐ Physical changes to facility

- ☐ Installation of mechanical drag system
- ☐ Boiler alteration to accommodate the mechanical drag system
- ☐ Installation of completely dry bottom ash handling system
- ☐ Installation of storage silos
- ☐ Modification of the silos to moisture-condition the ash
- ☐ Modification of the silos for ash transfer to rail cars
- ☐ Modification of the silos for marketable ash
- ☐ Construction of haul roads
- ☐ Construction of rail track
- ☐ Construction of landfill
- ☐ Increasing landfill capacity
- ☐ Changes to air permit
- ☐ Other, explain: _____

☐ Changes in personnel/training, explain: _____

☐ Changes in ash disposal practices

- ☐ Storage of ash in landfill
- ☐ Marketing of ash
- ☐ Hauling ash to off-site storage
- ☐ Dust suppression activities
- ☐ Other, explain: _____

CBI? ☐ Ye

C3-34. Indicate the types of destinations expected for the dry bottom ash from the planned system and the percentage of the dry bottom ash that is expected to go to each destination. [Check all boxes that apply.]

☐ Marketed, sold, and/or given away

Select _____ % of the dry bottom ash

If other, specify: _____

Select _____ % of the dry bottom ash

If other, specify: _____

Select _____ % of the dry bottom ash

If other, specify: _____

☐ Stored in landfills reported in Table A-6 _____ % of the dry bottom ash

☐ Stored in landfills NOT reported in Table A-6 _____ % of the dry bottom ash

☐ Other, specify:

[ ] [ ] % of the dry bottom ash

CBI?

☐ Ye

C3-35. Complete Table C-27 if the plant currently markets, sells, and/or gives away bottom ash transported by wet sluicing from the bottom ash handling system. For each destination, provide the tons, on a dry basis, of bottom ash transported by wet sluicing that is marketed, sold, and/or given away. Also provide the gross revenue generated from marketing/selling the bottom ash transported by wet sluicing for each destination.

Table C-27. Bottom Ash Transported by Wet Sluicing from the Bottom Ash Handling System Marketed/Sold in Calendar Years 2005, 2007, and 2009

Destination	Typical Percent Moisture of Bottom Ash	2005		2007		2009	
		Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $
Concrete/Concrete Products/Grout	%						
Blended Cement/Raw Feed for Clinker	%						
Flowable Fill	%						
Structural Fills/Embankments	%						
Road Base/Sub-base	%						
Soil Modification/Stabilization	%						
Mineral Filler in Asphalt	%						
Snow and Ice Control	%						
Blasting Grit/Roofing Granules	%						
Mining Applications	%						
Waste Stabilization/Solidification	%						
Agriculture	%						
Aggregate	%						
Other:	%						
Other:	%						

CBI?
☐ Ye

C3-36. If the plant is not in the process of installing or planning to install a dry bottom ash handling system, has a conversion/installation ever been considered or have cost estimates been previously obtained/developed for such a conversion/installation?

◯ Yes (Provide documentation/costs, for example, bid proposals or internal plant engineering estimates.)

◯ No (Skip to Section 3.5)

Note: All bid proposals and/or other documentation/costs originally submitted to the plant as CBI, should be marked CBI for the purpose of this collection request.

◯ I have attached documentation/

◯ I did not attach documentation/costs. Bel

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
Bottom Ash Handling System ID: Insert System ID

Part: C
Section Title: 3.5. Bottom Ash Cost Information - Conveyance

Instructions: Complete Section 3.5 (Questions C3-37 through C3-42) for the conveyance portion of each bottom ash handling system (wet or dry) identified in Table C-19 that was installed after January 1, 1985. Enter the bottom ash handling system ID in the space provided above (use the bottom ash handling system IDs assigned in Table C-19).

If you indicated in Questions C3-31 or C3-32 that the plant is either installing or planning to install a dry bottom ash handling system, complete Section 3.5, and enter "Planned" in the Bottom Ash Handling System ID space provided above.

Make copies of Section 3.5 for each bottom ash handling system operated in 2009, being installed, or planned to be installed by December 31, 2020 using the "Copy Section 3.5" button below.

The conveyance portion of the bottom ash handling system refers to the part of the system that conveys bottom ash from the boiler(s) of one or more generating units to the intermediate or final storage of the bottom ash. Dry bottom ash handling includes systems that collect and convey the bottom ash without any use of water, as well as systems in which bottom ash is conveyed mechanically or pneumatically away from a quench water bath (e.g., submerged chain conveyor systems). Wet bottom ash conveyance uses water (i.e., a sluice) to convey bottom ash away from the boiler to intermediate/final storage (e.g., ponds/impoundments). Note that dewatering bins are considered part of bottom ash conveyance.

Note: Bottom ash conveyance includes all capital and O&M costs required to dredge or empty ponds, dewatering bins, and/or surge tanks to intermediate storage.

Copy Section 3.5

CBI?
☐ Yes

C3-37. Identify all components of the conveyance portion of the bottom ash handling system. Provide the type of component and the number or length (e.g., length of any necessary piping) of each type of component in the system.

Table C-28. Bottom Ash Handling System Components - Conveyance

Individual Components	Number or Length (ft) of Components in the System	Component Size
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
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Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	

CBI? ☐ Yes

C3-38. Attach a block diagram that shows the entire bottom ash handling system operations. Label the conveyance, intermediate storage (see Part C Section 3.6) and transport/disposal (see Part C Section 3.7) portions of the system. The diagram should include all key components indicated in Tables C-28 and C-31 and identify all intermediate and final ash storage destinations. Indicate the movement of ash as well as water through the system. If ash from other fly ash or bottom ash handling systems is combined with ash from this fly ash handling system, indicate where the ash is combined and the ash handling systems involved. Provide as many diagrams as necessary to convey this information. Include the plant name, plant ID, and the bottom ash handling system ID in the upper right hand corner of the diagram.

☐ Diagram attached

CBI? ☐ Yes

C3-39. List all of the major components of the conveyance portion of the bottom ash handling system that a contractor(s) constructed/installed (or will construct/install, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL components identified in Tab

CBI? ☐ Yes

C3-40. List all of the operation and maintenance activities of the conveyance portion of the bottom ash handling system that a contractor(s) oversees (or will oversee, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL operation and maintenance activities dealing with the conveyance portion of the bottom ash

CBI? ☐ Yes

C3-41. Provide cost data in Table C-29 for the conveyance portion of the bottom ash handling system, both for the system as originally installed and for any modifications to the system. Include all conveyance costs including costs for components in Table C-28 as well as control systems, pads and foundations, and all other ancillary equipment. For planned bottom ash handling systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the plant incurred a land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Provide only the costs incurred to the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased and installed all equipment for the conveyance portion of the bottom ash handling system at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-29. Capital Cost for the Conveyance Portion of the Bottom Ash Handling System

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (includes site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (includes property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		
Indirect Costs				
Engineering Costs (includes process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/or				
Construction expenses (includes temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI?
☐ Yes

C3-42. Provide annual O&M costs data in Table C-30 for the conveyance portion of the bottom ash handling system. Provide best engineering estimates when actual data are not readily available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates and maintains the conveyance component of the bottom ash handling system at the contractor's expense, the plant should fill out "$ 0" for O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table C-29 "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-30. O&M Cost for the Conveyance Portion of the Bottom Ash Handling System for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption
Operating Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Materials	$		
Energy	$	$ per kWh	kWh/hr
Other:	$		
Other:	$		
Total O&M Cost (2009)	$		

Plant ID:
Plant Name:
Bottom Ash Handling System ID:

Part: C
Section Title: 3.6. Bottom Ash Cost Information - Intermediate Storage

Instructions: Complete Section 3.6 (Questions C3-43 through C3-51) for the intermediate storage portion of each bottom ash handling system identified in Table C-19 that was installed aft
Enter the bottom ash handling system ID in the space provided above (use the bottom ash handling system IDs assigned in Table C-19).

If you indicated in Questions C3-31 or C3-32 that the plant is either installing or planning to install a dry bottom ash handling system, complete Section 3.6, and enter "Planne
Handling System ID space provided above.

Make copies of Section 3.6 for each bottom ash handling system operated in 2009, being installed, or planned to be installed by December 31, 2020 using the "Copy Section

If you are instructed to skip forward to another section while completing this section for one bottom ash handling system, be sure to complete this section for each other bottor
system operated in 2009, being installed, or planned to be installed by December 31, 2020.

The intermediate storage portion of the bottom ash handling system refers to the facility/site where collected bottom ash is stored after conveyance, prior to the ash being tran
disposal. Dry bottom ash intermediate storage typically consists of stackout/holding areas for the bottom ash collected from mechanical drag systems. Wet bottom ash interme
typically consists of ponds/impoundments.

Note that intermediate storage includes all equipment and operations associated with loading dry, moisture-conditioned, or dewatered bottom ash into trucks or rail cars
for transport. Intermediate storage also includes all ash dust suppression activities at the plant.

Copy Section 3.6

CBI? ☐ Yes

C3-43. Does the bottom ash handling system use (or will it use, for planned systems) an intermediate storage facility/site?

- ◯ Yes (Continue)
- ◯ No (Skip to Section 3.7)

CBI? ☐ Yes

C3-44. Does the bottom ash handling system share any intermediate storage components with another bottom ash handling system or with a fly ash handling system? For example, ash are conveyed separately but stored in a common silo, the silo is considered a shared component.

- ◯ Yes, all intermediate storage components are shared with one or more other bottom ash handling systems (e
  Provide bottom ash handling system IDs, as assigned in Table C-19, for all systems sharing components _____ (Continue)
- ◯ Yes, some intermediate storage components are shared with one or more other bottom ash handling systems (e.g., multiple silos are used to
  Provide bottom ash handling system IDs, as assigned in Table C-19, for all systems sharing components _____
  Indicate which components are shared _____ (Continue)
- ◯ Yes, some or all intermediate storage components are shared with one or n tion 3.7)
- ◯ No e)

CBI? ☐ Yes

C3-45. Is a *pond/impoundment* unit or *pond/impoundment system* the intermediate storage destination of the ash collected by the bottom ash handling system?

- ◯ Yes (Skip to Section 4.1)
- ◯ No (Continue)

CBI?
☐ Yes

C3-46. Has cost information for the intermediate storage portion of the bottom ash handling system already been provided in the cost information for another bottom ash handling sys

◯ Yes, costs for all intermediate storage components of the bottom ash handling system have already been
Indicate which bottom ash handling system's intermediate storage cost information includes these costs _____ (Skip to Section 3.7)

◯ Yes, costs for some intermediate storage components of the bottom ash handling systems have a
Indicate which bottom ash handling system's intermediate storage cost information includes these costs _____
Estimate the capital costs associated with the shared intermediate storage components _____
Estimate the O&M costs associated with the shared intermediate storage components _____ (Continue)

◯ No (Skip to Section 3.7)

CBI?
☐ Yes

C3-47. Identify all components of the intermediate storage portion of the bottom ash handling system. Provide the type of component and the number of each type of component in th

Table C-31. Bottom Ash Handling System Components - Intermediate Storage

Individual Components		Number of Components in the System	Component Size
Select			Select
Other:			If other, specify:
Select			Select
Other:			If other, specify:
Select			Select
Other:			If other, specify:
Select			Select
Other:			If other, specify:
Select			Select
Other:			If other, specify:
Select			Select
Other:			If other, specify:
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Other:			If other, specify:
Select			Select
Other:			If other, specify:
Select			Select
Other:			If other, specify:

CBI?
☐ Yes

C3-48. List all of the major components of the intermediate storage portion of the bottom ash handling system that a contractor(s) constructed/installed (or will construct/install, for pla
the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL components identified inTable

CBI?
☐ Yes

C3-49. List all of the operation and maintenance activities of the intermediate storage portion of the bottom ash handling system that a contractor(s) oversees (or will oversee, for plar
contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL operation and maintenance activities dealing with the intermediate storage portion of

CBI?
☐ Yes

C3-50. Provide cost data in Table C-32 for the intermediate storage portion of the bottom ash handling system, both for the system as originally installed and for any modifications to
all intermediate storage costs including costs for components in Table C-31 as well as control systems, pads and foundations, and all other ancillary equipment. For planned b
systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if th
land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased and installed all the equipment fo
storage portion of the bottom ash handling system at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees i
should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-32. Capital Cost for the Intermediate Storage Portion of the Bottom Ash Handling System

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		

Site preparation (including site clearing, all demolition, grading, roads, walking areas, fences)	$		$	
Land (including property costs and survey fees)	$		$	
Total Direct Costs	**$**		**$**	
Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$		$	
b. Owner's Overhead Engineering Costs	$		$	
☐ Hired outside engineering firm to oversee design and/o				
Construction expenses (including temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$		$	
Other Contractor's Fees	$		$	
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$		$	
Total Indirect Costs	**$**		**$**	
Total Capital Cost	**$**		**$**	

CBI?
☐ Yes

C3-51. Provide annual O&M costs data in Table C-33 for the intermediate storage portion of the bottom ash handling system. Provide best engineering estimates when actual data ar available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates and maintains the intermediate stc bottom ash handling system at the contractor's expense, the plant should fill out "$ 0" for O&M costs. Any contractor costs/fees incurred by the plant should be accounted for "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-33. O&M Cost for the Intermediate Storage Portion of the Bottom Ash Handling System for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing
Operating Labor (Water Trucks Only)	$	$ Per hour (average rate of labor)	
Operating Labor (All other operating costs)	$	$ Per hour (average rate of labor)	
Maintenance Labor	$	$ Per hour (average rate of labor)	
Maintenance Materials	$		
Energy	$	$ per kWh	
Other:	$		
Other:	$		
Total O&M Cost (2009)	$		

Insert Plant ID
Insert Plant Name
Insert System ID

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/Consumption
No. of workers
hpd
dpy
No. of workers
hpd
dpy
No. of workers
hpd
dpy
kWh/hr

Plant ID:
Plant Name:
Bottom Ash Handling System ID:

Part: C
Section Title: 3.7. Bottom Ash Cost Information - Transport/Disposal

Instructions: Complete Section 3.7 (Questions C3-52 through C3-59) for the ash transport/disposal portion of each bottom ash handling system identified in Table C-19 that was installed aft 1985. Enter the bottom ash handling system ID in the space provided above (use the bottom ash handling system IDs assigned in Table C-19).

If you indicated in Questions C3-31 or C3-32 that the plant is either installing or planning to install a dry bottom ash handling system, complete Section 3.7, and enter "Planned" Handling System ID space provided above.

Make copies of Section 3.7 for each bottom ash handling system operated in 2009, being installed, or planned to be installed by December 31, 2020 using the "Copy Section 3.

If you are instructed to skip forward to another section while completing this section for one bottom ash handling system, be sure to complete this section for each other bottom system operated in 2009, being installed, or planned to be installed by December 31, 2020.

The ash transport/disposal portion of the bottom ash handling system refers to the transportation of ash from intermediate storage to final disposal.

An example of ash transport/disposal is transportation used to haul ash off site (e.g., ash that is marketed and shipped off site to a reuse application). Ash transport typically cor vehicles that are used to transport the ash. The capital and O&M costs for ash transport/disposal may include the road or rail infrastructure (roads, tracks, lights), the trucks and operation and maintenance costs associated with the trucks and rail cars, and ash disposal fees.

Note that capital and operation and maintenance costs associated with landfills/landfilling are requested in Part F and they should not be included here in Section 3.7.

Copy Section 3.7

CBI?
☐ Ye

C3-52. Does the bottom ash handling system share any transport/disposal components with another bottom ash handling system or with a fly ash handling system? For example, if fly ash are transported using the same trucks, the trucks are considered a shared component.

◯ Yes, all transport/disposal components are shared with one or more other bottom ash handling systems (e.g.
Provide bottom ash handling system IDs, as assigned in Table C-19, for all systems sharing components _____ (Continue)

◯ Yes, some transport/disposal components are shared with one or more other bottom ash handling syst
Provide bottom ash handling system IDs, as assigned in Table C-19, for all systems sharing components _____
Indicate which components are shared _____ (Continue)

◯ Yes, some or all transport/disposal components are shared with one or mor (Skip to Section 4.1)

◯ No (Continue)

CBI?
☐ Yes

C3-53. Is a *pond/impoundment* unit or *pond/impoundment system* the final destination of the ash collected by the bottom ash handling system?

◯ Yes (Skip to Section 4.1)

◯ No (Continue)

CBI?
☐ Yes

C3-54. Has cost information for the transport/disposal portion of the bottom ash handling system already been provided in the cost information for another bottom ash handling system?

◯ Yes, costs for all transport/disposal components of the bottom ash handling system have already been pro
Indicate which bottom ash handling system's transport/disposal cost information includes these costs _____ (Skip to Section 4.1)

◯ Yes, costs for some transport/disposal components of the bottom ash handling systems have alrea
Indicate which bottom ash handling system's transport/disposal cost information includes these costs _____
Estimate the capital costs associated with the shared transport/disposal components except for landfills _____
Estimate the O&M costs associated with the shared transport/disposal components except for landfills _____ (Continue)

◯ No (Continue)

CBI?
☐ Yes

C3-55. What methods are used to transport the collected bottom ash to the final disposal? [Check all boxes that apply.]

☐ Trucks
How many trucks does the plant use for the transportation and disposal of dry bottom ash?

Indicate whether the trucks were bought, leased or contracted out.
☐ Bought
☐ Leased
☐ Contracted out

☐ Rail ca
How many rail cars does the plant use for the transportation and disposal of dry bottom ash?

Indicate whether the rail cars were bought, leased or contracted out.
☐ Bought
☐ Leased
☐ Contracted out

☐ Other, specify (e

CBI?
☐ Yes

C3-56. List all of the major components of the transport/disposal portion of the bottom ash handling system that a contractor(s) constructed/installed (or will construct/install, for planned contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL ash transport/disposal equipment and/or infras

CBI?
☐ Yes

C3-57. List all of the operation and maintenance activities of the transport/disposal portion of the bottom ash handling system that a contractor(s) oversees(or will oversee, for planned contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL transport/disposal activities at the contractor's expense.

CBI?
☐ Yes

C3-58. Provide cost data in Table C-34 for the transport/disposal of the collected bottom ash, both for the system as originally installed and for any modifications to the system. Include transport/disposal costs incldluing costs for components in Table C-33 as well as control systems, pads and foundations, and all other ancillary equipment. For planned bottom a systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note that capital costs associated with *landfills*/landfilling are requested in Part F. Do NOT include landfill costs in Table C-34.

Note: Provide only the costa incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased all rail cars and/or trucks for the tra bottom ash at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-34. Capital Cost for the Transport/Disposal of Collected Bottom Ash

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (including site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (includes property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		
Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/o				
Construction expenses (including temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		

Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI?
☐ Yes

C3-59. Provide annual O&M costs data in Table C-35 for the transport/disposal of the collected bottom ash. Provide best engineering estimates when actual data are not readily availal an estimate, note the methods that were used to make the estimates in the Comments page.

Note that O&M costs associated with *landfills*/landfilling are requested in Part F. Do NOT include landfill costs in Table C-35.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates the transportation and disposal of th contractor's expense, the plant should fill out "$ 0" for the cost of all operating O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-35. O&M Cost for the Transport/Disposal Portion of the Bottom Ash Handling System for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption	Trans
Operating Labor (Trucks/Rail Cars/Other Transport)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Operating Labor (All other operating costs)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Maintenance Materials	$			
Energy	$	$ per kWh	kWh/hr	
Ash Removal/Disposal Fee	$			
Other:	$			
Other:	$			
Total O&M Cost (2009)	$			

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Insert Plant Name
Insert System ID

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Loads per day dpy

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name

Part: C
Section Title: 4.1. Combined Fly Ash and Bottom Ash Information

Instructions: Complete Section 4.1 (Question C4-1 through C4-2) for fly ash handling systems and bottom ash handling systems (identified in Table C-2 and Table C-19) installed after January 1, 1985, or planned to be installed by December 31, 2020, that share components of intermediate storage and/or transport/disposal.

CBI?
☐ Yes

C4-1. Do any existing fly ash handling systems identified in Table C-2 that were installed after January 1, 1985 (or will any planned fly ash handling systems) share any intermediate storage and/or transport/disposal components with any existing bottom ash handling systems identified in Table C-19 that were installed after January 1, 1985 (or any planned bottom ash handling systems)? For example, if fly ash and bottom ash are conveyed separately but stored in a common silo, the silo is considered a shared component.

○ Yes (Continue)
○ No (Skip to Section 5)

CBI?
☐ Yes

C4-2. In Table C-36, indicate which fly ash handling systems and bottom ash handling systems combine ash for intermediate storage and/or transport and disposal. If you indicated in Questions C2-31 or C2-32 that the plant is either installing or planning to install a dry fly ash handling system, and this system will combine ash with a bottom ash handling system, check "Planned fly ash system". If you indicated in Questions C3-31 or C3-32 that the plant is either installing or planning to install a dry bottom ash handling system, and this system will combine ash with a fly ash handling system, check "Planned bottom ash system".

Table C-36: Fly Ash and Bottom Ash Handling Systems that Combine Ash

Combined Intermediate Storage		Combined Transport/Disposal	
☐ FA-1	☐ BA-1	☐ FA-1	☐ BA-1
☐ FA-2	☐ BA-2	☐ FA-2	☐ BA-2
☐ FA-3	☐ BA-3	☐ FA-3	☐ BA-3
☐ FA-4	☐ BA-4	☐ FA-4	☐ BA-4
☐ FA-5	☐ BA-5	☐ FA-5	☐ BA-5
☐ FA-6	☐ BA-6	☐ FA-6	☐ BA-6
☐ FA-7	☐ BA-7	☐ FA-7	☐ BA-7
☐ FA-8	☐ BA-8	☐ FA-8	☐ BA-8
☐ FA-9	☐ BA-9	☐ FA-9	☐ BA-9
☐ FA-10	☐ BA-10	☐ FA-10	☐ BA-10
☐ Planned fly ash system(s)		☐ Planned fly ash system(s)	
☐ Planned bottom ash system(s		☐ Planned bottom ash system(s	

Plant ID:
Plant Name:

Part: C
Section Title: 4.2. Combined Fly Ash and Bottom Ash Cost Information - Intermediate Storage

Instructions: Complete Section 4.2 (Questions C4-3 through C4-9) for fly ash and bottom ash handling systems installed after January 1, 1985, or planning to be installed by December 31 ash for intermediate storage (as indicated in Table C-36).

The combined intermediate storage portion of the fly ash and bottom ash handling systems refers to the facility/site where collected fly ash and bottom ash are stored after co the ash being transported to final disposal. Dry combined intermediate storage typically consists of silos. Wet combined intermediate storage typically consists of ponds/impou

Note that combined intermediate storage includes all equipment and operations associated with loading dry, moisture-conditioned, or dewatered ash into trucks or rail cars for transport. Combined intermediate storage also includes all ash dust suppression activities at the plant.

CBI? ☐ Yes

C4-3. Did you identify in Table C-36 a fly ash handling system and a bottom ash handling system that share intermediate storage components?

◯ Yes, ALL intermediate storage con (Continue)
◯ Yes, SOME intermediate storage con
Indicate which components are shared: _____ (Continue)
◯ No (Skip to Section 4.3)

CBI? ☐ Yes

C4-4. Is a *pond/impoundment* unit or *pond/impoundment system* the combined intermediate storage destination of the ash collected by the fly ash and bottom ash handling systems

◯ Yes (Skip to Section 5)
◯ No (Continue)

CBI? ☐ Yes

C4-5. Identify all components of the combined intermediate storage portion of the fly ash and bottom ash handling systems. Provide the type of component and the number of each in the systems.

Table C-37. Fly Ash and Bottom Ash Handling System Components - Combined Intermediate Storage

Individual Components		Number of Components in the System	Component Size	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
			Select	

Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	

CBI?
☐ Yes

C4-6. List all of the major components of the combined intermediate storage portion of the fly ash and bottom ash handling systems that a contractor(s) constructed/installed (or will
planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL components identified inTable

CBI?
☐ Yes

C4-7. List all of the operation and maintenance activities of the combined intermediate storage portion of the fly ash and bottom ash handling systems that a contractor(s) oversees
planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL operation and maintenance activities dealing with the combined intermediate storage pc

CBI?
☐ Yes

C4-8. Provide cost data in Table C-38 for the combined intermediate storage portion of the fly ash and bottom ash handling systems, both for the systems as originally installed and
modifications to the systems. Include all intermediate storage costs including costs for components in Table C-37 as well as control systems, pads and foundations, and all otl
equipment. For planned ash handling systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do no
For example, if the plant incurred a land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased and installed all the equipment fc
intermediate storage portion of the fly ash and bottom ash handling systems at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". A
costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-38. Capital Cost for the Combined Intermediate Storage Portion of the Fly Ash and Bottom Ash Handling Systems

Project	Cost for Systems as Originally Installed	Cost for Modifications to Systems	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (including site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (including property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		
Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/o				

Construction expenses (including temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI?
☐ Yes

C4-9. Provide annual O&M costs data in Table C-39 for the combined intermediate storage portion of the fly ash and bottom ash handling systems. Provide best engineering estima data are not readily available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates and maintains the combined interr portion of the fly ash and bottom ash handling system at the contractor's expense, the plant should fill out "$ 0" for O&M costs. Any contractor costs/fees incurred by the plan accounted for in the Table C-38 "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-39. O&M Cost for the Combined Intermediate Storage Portion of the Fly Ash and Bottom Ash Handling Systems for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing
Operating Labor (Water Trucks Only)	$	$ Per hour (average rate of labor)	
Operating Labor (All other operating costs)	$	$ Per hour (average rate of labor)	
Maintenance Labor	$	$ Per hour (average rate of labor)	
Maintenance Materials	$		
Energy	$	$ per kWh	
Other:	$		
Other:	$		
Total O&M Cost (2009)	$		

Insert Plant ID
Insert Plant Name

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nveyance, prior to
ındments.

;?

type of component

construct/install, for

(or will oversee, for

for any
her ancillary
t adjust for inflation.

r the combined
Any contractor

ıtes when actual

nediate storage
ıt should be

/Consumption
No. of workers
hpd
dpy
No. of workers
hpd
dpy
No. of workers
hpd
dpy
kWh/hr

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name

Part: C
Section Title: 4.3. Combined Fly Ash and Bottom Ash Cost Information - Transport/Disposal

Instructions: Complete Section 4.3 (Questions C4-10 through C4-16) for fly ash and bottom ash handling systems installed after January 1, 1985, or planned to be installed by December 31, 2020, that transport/dispose of ash together (as indicated in Table C-36).

The combined ash transport/disposal portion of the fly ash and bottom ash handling systems refers to the transportation of ash from intermediate storage to final disposal.

An example of combined ash transport/disposal is transportation used to haul ash off site (e.g., ash that is marketed and shipped off site to a reuse application). Combined ash transport typically consists of roads and vehicles that are used to transport the ash. The capital and O&M costs for combined ash transport/disposal may include the road or rail infrastructure (roads, tracks, lights), the trucks and rail cars, the operation and maintenance costs associated with the trucks and rail cars, and ash disposal fees.

Note that capital and operation and maintenance costs associated with *landfills*/landfilling are requested in Part F and they should not be included here in Section 4.3.

CBI? ☐ Yes

C4-10. Did you identify in Table C-36 a fly ash handling system and a bottom ash handling system that share transport/disposal components?

- ○ Yes, ALL transport/disposal components (Continue)
- ○ Yes, SOME transport/disposal com
  Indicate which components are shared: _____ (Continue)
- ○ No (Skip to Section 5)

CBI? ☐ Yes

C4-11. Is a *pond/impoundment* unit or *pond/impoundment system* the final destination of the combined fly ash and bottom ash?

- ○ Yes (Skip to Section 5)
- ○ No (Continue)

CBI? ☐ Yes

C4-12. What methods are used to transport the combined fly ash and bottom ash to the final disposal? [Check all boxes that apply.]

☐ Trucks
How many trucks does the plant use for the transportation and disposal of combined fly ash and bottom ash?
_____
Indicate whether the trucks were bought, leased or contracted out.
☐ Bought
☐ Leased
☐ Contracte

☐ Rail ca
How many rail cars does the plant use for the transportation and disposal of combined fly ash and bottom ash?
_____
Indicate whether the rail cars were bought, leased or contracted out.
☐ Bought
☐ Leased
☐ Contracte

☐ Other, specify (e. _____

CBI? ☐ Yes

C4-13. List all of the major components of the combined transport/disposal portion of the fly ash and bottom ash handling systems that a contractor(s) constructed/installed (or will construct/install, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL combined ash transport/disposal equipment ar

CBI? ☐ Yes

C4-14. List all of the operation and maintenance activities of the combined transport/disposal portion of the fly ash and bottom ash handling systems that a contractor(s) oversees (or will oversee, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL combined transport/disposal activities at the contractor'

CBI? ☐ Yes

C4-15. Provide cost data in Table C-40 for the transport/disposal of the combined fly ash and bottom ash, both for the systems as originally installed and for any modifications to the systems. Include all transport/disposal costs including costs for the components listed in Table C-39 as well as control systems, pads and foundations, and all other ancillary equipment. For planned ash handling systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the plant incurred a land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note that capital costs associated with *landfills*/landfilling are requested in Part F. Do NOT include landfill costs in Table C-40.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased all rail cars and/or trucks for the transportation of the combined fly ash and bottom ash at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-40. Capital Cost for the Transport/Disposal of Combined Fly Ash and Bottom Ash

Project	Cost for Systems as Originally Installed	Cost for Modifications to Systems	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		

Site preparation (including site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (including property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		
Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/o				
Construction expenses (including temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI?
☐ Yes

C4-16. Provide annual O&M costs data in Table C-41 for the transport/disposal of the combined fly ash and bottom ash. Provide best engineering estimates when actual data are not readily available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note that O&M costs associated with *landfills*/landfilling are requested in Part F. Do NOT include landfill costs in Table C-41.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates the transportation and disposal of the combined fly ash and bottom ash at the contractor's expense, the plant should fill out "$ 0" for the cost of all operating O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table C-40 "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-41. O&M Cost for the Combined Transport/Disposal Portion of the Fly Ash and Bottom Ash Handling Systems for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption	Transport Rate
Operating Labor (Trucks/Rail Cars/Other Transport)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	Loads per day dpy

Operating Labor (All other operating costs)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Maintenance Materials	$			
Energy	$	$ per kWh	kWh/hr	
Ash Removal/Disposal Fee	$			
Other:	$			
Other:	$			
Total O&M Cost (2009)	$			

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
SE Unit ID: Insert SE Unit ID

Part: C
Section Title: 5. Economizer Ash Handling Information

Instructions: Make copies of Section 5 (Questions C5-1 through C5-5) for each fossil-fueled steam electric generating unit at your plant that generates economizer ash using the "Copy Section 5" button below. See Part A Section 8 for steam electric generating unit fuel classifications. Enter the steam electric generating unit ID (use unit IDs assigned in Table A-8) in the space above titled "SE Unit ID".

Copy Section 5

CBI? ☐ Yes

C5-1. Is economizer ash from this fossil-fueled steam electric generating unit collected with air heater ash?

- ○ Yes (Complete the remainder of Section 5 for economizer and air heater ash together. Do NOT complete Section 6.)
- ○ No (Continue)

CBI? ☐ Yes

C5-2. Indicate the method of handling the economizer ash.

- ○ Segregated from fly and bo
  Describe how the segregated ash was handled: _____ (Skip to Question C5-4)
- ○ Combined with fly and/or bot (Continue)

CBI? ☐ Yes

C5-3. Identify how the economizer ash is combined with fly ash and/or bottom ash.

- ○ Handled wet, with fly
- ○ Handled wet, with bot
- ○ Handled dry, with fly
- ○ Handled dry, with bot
- ○ Other, explain:

_____

CBI? ☐ Yes

C5-4. Provide the average amount of dry economizer ash produced.

_____ tpd (dry weight basis)

_____ dpy

CBI? ☐ Yes

C5-5. Is process wastewater generated from the handling of economizer ash?

○ Yes (Continue)

○ No (Skip to Section 6)

Provide the volume of economizer ash wastewater generated in 2009 (gpd) and the frequency of economizer ash wastewater generation (days).

_____ gpd Over _____ days

Provide the destination of the economizer ash wastewater generated: Select

CBI? ☐ Yes

C5-6. What is the final disposition/destination of the collected economizer ash? [Check all boxes that apply.] Indicate the percentage of economizer ash transported to each destination.

☐ Stored in a landfill reported i	_____ % of economizer ash
☐ Stored in a pond/impoundment reported in Table A-4	_____ % of economizer ash
☐ Stored in a landfill NOT reported in Tabl	_____ % of economizer ash
☐ Hauled off site (to be m	_____ % of economizer ash
☐ Hauled off site (to be gi	_____ % of economizer ash
☐ Othe _____	_____ % of economizer ash

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
SE Unit ID: Insert SE Unit ID

Part: C
Section Title: 6. Air Heater Ash Handling Information

Instructions: Make copies of Section 6 (Questions C6-1 through C6-4) for each fossil-fueled steam electric generating unit at your plant that generates air heater ash using the "Copy Section 6" button below. See Part A Section 8 for steam electric generating unit fuel classifications. Enter the steam electric generating unit ID (use unit IDs assigned in Table A-8) in the space above titled "SE Unit ID".

Copy Section 6

CBI? ☐ Yes

C6-1. Indicate the method of handling the air heater ash.

◯ Segregated from fly and bo
Describe how the segregated ash was handled: _____ (Skip to Question C6-3)

◯ Combined with fly and/or bot (Continue)

CBI? ☐ Yes

C6-2. Identify how the air heater ash is combined with fly ash and/or bottom ash.

◯ Handled wet, with fl
◯ Handled wet, with bot
◯ Handled dry, with fly
◯ Handled dry, with bot
◯ Other, explain:
_____

CBI? ☐ Yes

C6-3. Provide the average amount of dry air heater ash produced.

_____ tpd (dry weight basis)
_____ dpy

CBI? ☐ Yes

C6-4. Is process wastewater generated from the handling of air heater ash?

○ Yes (Continue)

○ No (Skip to next Questionnaire Part)

Provide the volume of air heater ash wastewater generated in 2009 (gpd) and the frequency of air heater ash wastewater generation (days).

_____ gpd Over _____ days

Provide the destination of the air heater ash wastewater generated: Select

CBI? ☐ Yes

C6-5. What is the final disposition/destination of the collected air heater ash? [Check all boxes that apply.] Indicate the percentage of air heater ash transported to each destination.

☐ Stored in a landfill reported	_____ % of air heater ash
☐ Stored in a pond/impoundment reported in Table A-4	_____ % of air heater ash
☐ Stored in a landfill NOT reported in Tab	_____ % of air heater ash
☐ Hauled off site (to be m	_____ % of air heater ash
☐ Hauled off site (to be gi	_____ % of air heater ash
☐ Othe _____	_____ % of air heater ash

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name

Part: C
Section Title: Part C Comments

Instructions: Cross reference your comments by question number and indicate the confidential status of your comment by checking the box next to “Yes” under "CBI?" (Confidential Business Information).

CBI?	Question Number	Comment
☐ Yes		
☐ Yes		
☐ Yes		
☐ Yes		
☐ Yes		
☐ Yes		
☐ Yes		
☐ Yes		
☐ Yes		
☐ Yes		

CBI?		
☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		
CBI? ☐ Yes		

Steam Electric Questionnaire Code Tables

Process Wastewaters	
For Use in Tables and Questions throughout Parts A, B, C, D, and F.	
Air heater cleaning water	AHCW
Ash pile runoff	APR
Boiler blowdown	BB
Boiler fireside cleaning water	BFCW
Boiler tube cleaning water	BTCW
Bottom ash sluice	BAS
Carbon capture wastewater	CCAPW
Coal pile runoff	CPR
Combined ash sluice	CAS
Combustion turbine cleaning (combustion gas portion of turbine) water	COMBCW
Combustion turbine cleaning (compressor portion of the turbine) water	COMPRCW
Combustion turbine evaporative coolers blowdown	TECB
Cooling tower blowdown	CTB
FGD scrubber purge	SCRBP
FGD slurry blowdown	FGDB
Filter Backwash	FLTBW
Floor drain wastewater	FDW
Flue gas mercury control system wastewater	FGMCW
Fly ash sluice	FAS
General runoff	GR
Gypsum pile runoff	GPR
Gypsum wash water	GYPWW
Ion exchange wastewater	IXW
Landfill runoff - capped landfill	LRC
Landfill runoff - uncapped landfill	LRUC
Leachate	LEACH
Limestone pile runoff	LPR
Mill reject sluice	MRS

Treated Wastewaters	
For Use as Effluents from Pond/Impoundment Systems and/or Wastewater Treatment Systems in Part D, Table D-4.	
Effluent - 1	EFF-1
Effluent - 2	EFF-2
Effluent - 3	EFF-3
Effluent - 4	EFF-4
Effluent - 5	EFF-5
Effluent - 6	EFF-6
Filter backwash	FltBW
Sludge	SLDG
For Use as Influents to Pond/Impoundment Systems and/or Wastewater Treatment Systems in Part D, Table D-3, AND Recycled Waters Throughout Questionnaire.	
POND-1 Effluent	POND-1-EFF
POND-2 Effluent	POND-2-EFF
POND-3 Effluent	POND-3-EFF
POND-4 Effluent	POND-4-EFF
POND-5 Effluent	POND-5-EFF
POND-6 Effluent	POND-6-EFF
POND-7 Effluent	POND-7-EFF
POND-8 Effluent	POND-8-EFF
POND-9 Effluent	POND-9-EFF
POND-10 Effluent	POND-10-EFF
POND-A Effluent	POND-A-EFF
POND-B Effluent	POND-B-EFF
POND-C Effluent	POND-C-EFF
WWT-1 Effluent	WWT-1-EFF
WWT-2 Effluent	WWT-2-EFF
WWT-3 Effluent	WWT-3-EFF
WWT-4 Effluent	WWT-4-EFF
WWT-5 Effluent	WWT-5-EFF

Process Wastewaters	
For Use in Tables and Questions throughout Parts A, B, C, D, and F.	
Once -through cooling water	CW
Reverse osmosis reject water	RORW
SCR catalyst regeneration wastewater	SCRRW
SCR catalyst washing wastewater	SCRWW
Soot blowing wash water	SOOTW
Steam turbine cleaning water	STCW
Yard drain wastewater	YARDW

Treated Wastewaters	
For Use as Influents to Pond/Impoundment Systems and/or Wastewater Treatment Systems in Part D, Table D-3, AND Recycled Waters Throughout Questionnaire.	
WWT-6 Effluent	WWT-6-EFF
WWT-A Effluent	WWT-A-EFF
WWT-B Effluent	WWT-B-EFF
WWT-C Effluent	WWT-C-EFF

Wastewater Treatment Units	
For Use in Tables and Questions Throughout Parts D and F.	
Adsorptive media	ADSORB
Aerobic Biological Reactor	AERBIO
Anaerobic Biological Reactor	ANBIO
Aerobic/Anaerobic Biological Reactor	AER/ANBIO
Chemical Precipitation Reaction Tank 1 - 1	CP-1-1
Chemical Precipitation Reaction Tank 1 - 2	CP-1-2
Chemical Precipitation Reaction Tank 2 - 1	CP-2-1
Chemical Precipitation Reaction Tank 2 - 2	CP-2-2
Chemical Precipitation Reaction Tank 3 - 1	CP-3-1
Chemical Precipitation Reaction Tank 3 - 2	CP-3-2
Clarification, Primary - 1	CL-P-1
Clarification, Primary - 2	CL-P-2
Clarification, Secondary - 1	CL-S-1
Clarification, Secondary - 2	CL-S-2
Clarification, Tertiary - 1	CL-T-1
Clarification, Tertiary - 2	CL-T-2
Constructed wetland - Cell 1	CWL -1
Constructed wetland - Cell 2	CWL -2
Constructed wetland - Cell 3	CWL -3
Constructed wetland - Cell 4	CWL -4
Constructed wetland - Cell 5	CWL -5
Constructed wetland - Cell 6	CWL -6
Constructed wetland system	CWTS
Equalization, Primary	EQ-P
Equalization, Secondary	EQ-S
Filter, Microfiltration - 1	FLT-M-1
Filter, Microfiltration - 2	FLT-M-2

Destinations	
For Use in Tables and Questions Throughout Parts A, C, D, and F.	
Burned on site	BURN
Deep-well injection	DWELL
Discharge to POTW	POTW
Discharge to PrOTW	PrOTW
Discharge to surface water	SW
Evaporation	EVAP
Hauled off site for reuse (removal fee)	HAULR - RF
Hauled off site for reuse (given away)	HAULR - GA
Hauled off site for reuse (marketed and sold)	SOLD
Hauled off site for disposal	HAUL
Mixed with fly ash for disposal	MFA
On-site landfill (as reported in Table A-6)	LANDF
POND-1	POND-1
POND-2	POND-2
POND-3	POND-3
POND-4	POND-4
POND-5	POND-5
POND-6	POND-6
POND-7	POND-7
POND-8	POND-8
POND-9	POND-9
POND-10	POND-10
POND-A	POND-A
POND-B	POND-B
POND-C	POND-C
WWT-1	WWT-1
WWT-2	WWT-2

Wastewater Treatment Units	
For Use in Tables and Questions Throughout Parts D and F.	
Filter, Microfiltration - 3	FLT-M-3
Filter, Microfiltration - 4	FLT-M-4
Filter, Sand/Gravity - 1	FLT-S-1
Filter, Sand/Gravity - 2	FLT-S-2
Filter, Sand/Gravity - 3	FLT-S-3
Filter, Sand/Gravity - 4	FLT-S-4
Filter, Ultrafiltration - 1	FLT-U-1
Filter, Ultrafiltration - 2	FLT-U-2
Filter, Ultrafiltration - 3	FLT-U-3
Filter, Ultrafiltration - 4	FLT-U-4
Filter press - 1	FP-1
Filter press - 2	FP-2
Holding tank	HT
Ion exchange	IX
Natural wetlands	NW
pH adjustment - 1	PH-1
pH adjustment - 2	PH-2
pH adjustment - 3	PH-3
Reverse osmosis	ROS
Pond Unit - 1	SPD-1
Pond Unit - 2	SPD-2
Pond Unit - 3	SPD-3
Pond Unit - 4	SPD-4
Pond Unit - 5	SPD-5
Pond Unit - 6	SPD-6
Pond Unit - 7	SPD-7
Pond Unit - 8	SPD-8
Pond Unit - 9	SPD-9

Destinations	
For Use in Tables and Questions Throughout Parts A, C, D, and F.	
WWT-3	WWT-3
WWT-4	WWT-4
WWT-5	WWT-5
WWT-6	WWT-6
WWT-A	WWT-A
WWT-B	WWT-B
WWT-C	WWT-C
Reuse as boiler water	RECYC - BW
Reuse as bottom ash sluice	RECYC - BAS
Reuse as combined ash sluice	RECYC - CAS
Reuse as FGD slurry preparation water	RECYC - FGDP
Reuse as FGD absorber makeup	RECYC - FGDAB
Reuse as fly ash sluice	RECYC - FAS
Reuse as mill reject sluice	RECYC - MRS
Reuse in cooling towers	RECYC - CW

Wastewater Treatment Units	
For Use in Tables and Questions Throughout Parts D and F.	
Pond Unit - 10	SPD-10
Pond Unit - 11	SPD-11
Pond Unit - 12	SPD-12
Pond Unit - 13	SPD-13
Pond Unit - 14	SPD-14
Settling tank - 1	ST-1
Settling tank - 2	ST-2
Settling tank - 3	ST-3
Settling tank - 4	ST-4
Settling tank - 5	ST-5
Thickener - 1	TH-1
Thickener - 2	TH-2
Vacuum drum filter - 1	VF-1
Vacuum drum filter - 2	VF-2
Vacuum filter belt - 1	VFB-1
Vacuum filter belt - 2	VFB-2

Solids Handling	
For Use as Planned Solids Handling for the FGD Slurry Blowdown in Part B Table B-2.	
Centrifuge - 1	CENT-1
Centrifuge - 2	CENT-2
Centrifuge - 3	CENT-3
Centrifuge - 4	CENT-4
Hydrocyclones - 1	HYC-1
Hydrocyclones - 2	HYC-2
Hydrocyclones - 3	HYC-3
Hydrocyclones - 4	HYC-4
Filter press - 1	FP-1
Filter press - 2	FP-2
Thickener - 1	TH-1
Thickener - 2	TH-2
Vacuum drum filter - 1	VF-1
Vacuum drum filter - 2	VF-2
Vacuum filter belt - 1	VFB-1
Vacuum filter belt - 2	VFB-2

Plant ID: Insert Pla
Plant Name: Insert Pla
SE Unit ID: Insert SE

Part: C
Section Title: 2.2. Fly Ash Handling - Unit Level Information

Instructions: Complete Section 2.2 (Questions C2-3 through C2-7) for each steam electric generating unit serviced in 2009 by a fly ash handling identified in Table C-2.

Make copies of Section 2.2 for each steam electric generating unit using the "Copy Section 2.2" button below. Enter the steam elec generating unit ID (use unit IDs assigned in Table A-8) in the space above titled "SE Unit ID".

CBI?
☐ Yes

C2-3. In Table C-3, indicate all of the fly ash handling systems that serviced the steam electric generating unit in 2009. Addtionally, provic percent of ash from the steam electric generating unit handled by each fly ash handling system, and the number of days each syste handled the ash in 2009. If the fly ash handling system can service the unit, but did not handle any of its ash in 2009, enter 0% and

Table C-3. Fly Ash Handling Systems Servicing the Steam Electric Generating Unit

Fly Ash Handling Systems Servicing the Steam Electric Generating Unit [Check all boxes that apply]	Percent of Ash Handled by the Fly Ash Handling System in 2009 (Dry weight basis)	Number of Days Ash was Handled by the Fly Ash Handling System in 2009
☐ FA-1	%	
☐ FA-2	%	
☐ FA-3	%	
☐ FA-4	%	
☐ FA-5	%	

☐ FA-6	%	
☐ FA-7	%	
☐ FA-8	%	
☐ FA-9	%	
☐ FA-10	%	

CBI?
☐ Yes

C2-4. Was the fly ash from this steam electric generating unit handled by both a *wet and dry fly ash handling system* in 2009?

○ Yes (Continue)

○ No (Skip to Section 2.3)

CBI?
☐ Yes

C2-5. If ash from the steam electric generating unit was handled by both wet and dry fly ash handling systems in 2009, indicate why. [Che
boxes that apply.] For each selection, identify the number of days in 2009 the wet system was operated for this reason.

☐ Wet fly ash handling system is operated during the times in which the dry collected fl

☐ Wet fly ash handling system is operated when the dry fly ash collection system is not operational due

☐ Wet fly ash handling system is operated in order to maintain its function as a backup to the dry system (i.e., wet system operated

☐ Wet fly ash handling system is operated because the dry fly ash handling system does not have the capacity to handle all o

☐ Other, explai

CBI?

☐ Yes

C2-6. If ash from the steam electric generating unit was handled by both a wet and dry fly ash handling systems in 2009, what modificatic be required to operate all the fly ash with the dry fly ash handling system? [Check all boxes that apply.]

- ☐ No system modifications necessary. Procedural changes would be sufficier
- ☐ Increase the capacity of the silo(s).
- ☐ Increase the number of silos.
- ☐ Modify the loading silos to have the ability to moisture condition the ash.
- ☐ Install/increase the capacity of landfills.
- ☐ Increase the capacity of the dry fly ash conveying equipment.
- ☐ Design/develop new infrastructure to dispose of dry ash. Specify new inf
- ☐ Other, expla

CBI?

☐ Yes

C2-7. If the current fly ash handling operations for the steam electric generating unit are expected to change in future years, indicate hov

- ◯ Decreased use of wet fly ash handling s
  Expected operating days per year for wet system
- ◯ End use of wet fly ash handling system.
  Expected end date
- ◯ No change expected in fly ash handling operations.
- ◯ Other, explain

Ash Handling

ant ID
ant Name
Unit ID

system

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0 days.

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days

days

days

days

days

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v.

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
Fly Ash Handling System ID: Insert System ID

Part: C
Section Title: 2.3. Dry Fly Ash Handling Information

Instructions: Make copies of Section 2.3 (Questions C2-8 through C2-23) for each *dry fly ash handling system* identified in Table C-2 using the "Copy Section 2.3" button below. Enter the fly ash handling system ID (use system IDs assigned in Table C-2) in the space above titled "Fly Ash Handling System ID".

CBI? ☐ Yes

C2-8. Indicate the type of the *dry fly ash handling system*.

- ◯ Vacuum syst
- ◯ Pressure sys
- ◯ Combined vacuum/pressure syste
- ◯ Mechanical system
- ◯ Other:

CBI? ☐ Yes

C2-9. Has the plant encountered any unscheduled generating unit outages caused by the dry fly ash handling system in the last five years?

- ◯ Yes ntinue)
- ◯ No ip to Question C2-11)

CBI? ☐ Yes

C2-10. In Table C-4, provide information on unscheduled generating unit outages caused by the dry fly ash handling system for each of the last five years.

Table C-4. Unscheduled Generating Unit Outages Caused by the Dry Fly Ash Handling System

	2005	2006	2007	2008	2009
Total days of outage					
Reason(s) for outage(s)					
Method(s) used to resolve outage(s)					

CBI? ☐ Yes

C2-11. Was the dry fly ash handling system installed as-is at the same time the oldest generating unit it services was built?

- ◯ Yes (Skip to Question C2-16)
- ◯ No, it was a re (Continue)

Year Built: _____

Shutdown time (days) required to bring dry fly ash handling system on line: _____

Was a generating unit outage(s), outside of regularly scheduled outages, required to bring the dry fly ash handling system on line?

- ◯ Yes
- ◯ No

CBI? ☐ Yes

C2-12. What type of retrofit was the dry fly ash handling system?

- ◯ The retrofit was made to an exis (Skip to Question C2-14)
- ◯ A dry fly ash handling system was installed (for operation in addition t (Continue)
- ◯ The retrofit was a complete conversion from a wet to dry fly ash h (Continue)

CBI? ☐ Yes

C2-13. Provide the reason(s) for the installation of the dry fly ash handling system or the complete conversion from the wet handling system to the dry handling system. [Check all boxes that apply.]

- ☐ The plant had issues meeting its ash *pond/impoundment* effluent permit limitations. Indicate for which *pollutant(s)*:
  - ☐ Hg
  - ☐ Se
  - ☐ As
  - ☐ Othe _____
- ☐ The plant switched to a low sulfur coal (e.g., PRB coal) that caused issues in the sluice piping used to convey wet fly ash to its ash pond(s)/impoundment(s), making dry fly ash handling more feasible from an operational/cost perspective.
- ☐ The plant identified markets for the dry-collected fly ash, providing an additional source of revenue.
- ☐ The plant had been approaching the limit of the capacity of the ash pond(s)/impoundment(s) used to store the ash.
- ☐ Other, explain: _____

CBI?
☐ Yes

C2-14. Provide the reason(s) for the retrofit to the existing dry handling system. [Check all boxes that apply.]

- ☐ Reason(s) for retrofit described as a wet to dry conversion in Question C2-13. Skip to Question C2-15.
- ☐ The plant decided to moisture-condition ash for transport/disposal.
- ☐ The plant wanted to increase the capacity of its dry fly ash handling system.
- ☐ The plant identified new markets for dry-collected fly ash.
- ☐ A higher demand from the plant's existing dry fly ash markets required increased capacity.
- ☐ Other, explain: _____

CBI?
☐ Yes

C2-15. Describe the changes that were required to retrofit (for a retrofit to an existing dry system, an installation of a dry system, or a complete conversion from wet to dry). [Check all boxes that apply.]

- ☐ Physical changes to facility
  - ☐ Installation of pressure/vacuum system and piping
  - ☐ Expansion of pressure/vacuum system and piping
  - ☐ Installation of storage silos
  - ☐ Modification of the silos to moisture-condition the ash
  - ☐ Modification of the silos for ash transfer to rail cars
  - ☐ Modification of the silos for marketable ash
  - ☐ Construction of haul roads
  - ☐ Construction of rail track
  - ☐ Construction of landfill. Provide the landfill ID(s) from Table A-6: _____
  - ☐ Increasing landfill capacity. Provide the landfill ID(s) from Table A-6: _____
  - ☐ Changes to air permit
  - ☐ Other, explain: _____
- ☐ Changes in personnel/training, explain: _____
- ☐ Changes in ash disposal practices
  - ☐ Storage of ash in landfills
  - ☐ Marketing of ash
  - ☐ Hauling ash to off-site storage
  - ☐ Dust suppression activities
  - ☐ Other, explain: _____

CBI?
☐ Yes

C2-16. Provide dry fly ash storage information in Table C-5, using the following definitions for "Storage Destination":

Storage Destination 1: The storage device that the fly ash immediately goes to from the fly ash collection equipment (i.e., baghouse or ESP).

Storage Destination 2: An additional storage step for the fly ash before end disposition. This row should only be completed if the ash does not reach end disposition after the first destination.

End (Final) Destination 3: The final storage destination of the ash. If the ash is deposited in more than one pond at the end disposition, provide an explanation on the Comments page.

For each storage destination, provide the distance the fly ash is transported, the amount of fly ash transported in 2009, and the percent moisture of the fly ash. Additionally, for each destination indicate how the fly ash is transported by entering one of the following options: conveyor belt/pipe, truck, barge, rail, or other (provide a description). If the fly ash is sold to more than one destination (e.g., some fly ash is sold for cement manufacturing and some is sold for structural fill) provide these percent moisture values in Table C-6 and enter the average percent moisture for all fly ash sold in Table C-5.

Table C-5. Dry Fly Ash Storage Information

Storage Destination	Type of Destination	Distance Transported (miles)	Tons of Fly Ash Transported to Destination in 2009 (dry weight basis)	How is Fly Ash Transported to Destination?	Percent Moisture of the Fly Ash Entering Destination
Storage Destination 1	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
Storage Destination 2	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
End (Final) Destination 3	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%

CBI? ☐ Yes

C2-17. Do you combine dry fly ash with *FGD solids* to form pozzolanic material?

○ Yes

○ No

CBI? ☐ Yes

C2-18. Does the plant market, sell, and/or give away dry fly ash from the dry ash handling system?

○ Yes (Continue)

○ No (Skip to Question C2-21)

CBI? ☐ Yes

C2-19. Complete Table C-6 if the plant markets, sells, and/or gives away dry fly ash from the fly ash handling system. For each destination, provide the tons of dry fly ash marketed, sold, and/or given away, the gross revenue generated from mareting/selling the dry fly ash for calendar years 2005, 2007, and 2009. Additionally, provide the typical percent moisture of the fly ash during calendar years 2005, 2007, and 2009. If the typical percent moisture of the fly ash was not constant during calendar years 2005, 2007, and 2009, note this information (include all typical percent moisture values for each year) in the Comments page.

Table C-6. Dry Fly Ash from the Fly Ash Handling System Marketed/Sold in Calendar Years 2005, 2007, and 2009

Destination	Typical Percent Moisture of Fly Ash	2005		2007		2009	
		Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $
Concrete/Concrete Products/Grout	%						
Blended Cement/Raw Feed for Clinker	%						
Flowable Fill	%						
Structural Fills/Embankments	%						
Road Base/Sub-base	%						
Soil Modification/ Stabilization	%						
Mineral Filler in Asphalt	%						
Snow and Ice Control	%						
Blasting Grit/Roofing Granules	%						
Mining Applications	%						

Waste Stabilization/ Solidification	%						
Agriculture	%						
Aggregate	%						
Other:	%						
Other:	%						

CBI? ☐ Yes

C2-20. What is the highest loss on ignition (LOI) at which dry fly ash from this fly ash handling system can still be marketed/sold?

CBI? ☐ Yes

C2-21. If water is used to moisten the fly ash, provide the source of the water used. [Check all boxes that apply.]

- ☐ Raw intake wa
- ☐ Intake water that has been treated on
- ☐ Select
- ☐ Select
- ☐ N/A: Fly ash is not moistened

CBI? ☐ Yes

C2-22. For water sources that may be used to moisten the fly ash (e.g., fresh intake, recycled process water), indicate the maximum chlorides concentration and maximum solids percentage that is acceptable for the water to be used. Identify any other criteria that the source water must meet. [Check all boxes that apply.]

- ☐ Chlorides concer ppm
- ☐ Solids percer %
- ☐ Othe
- ☐ N/A: Fly ash is not mo

CBI? ☐ Yes

C2-23. Indicate the criteria that the plant uses to determine if a water source is unacceptable for use (*recycle/reuse*) as *fly ash sluice* water. If the criteria are dictated by engineering design, provide specific elements of the design that dictate use.

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
Fly Ash Handling System ID: Insert System ID

Part: C
Section Title: 2.4. Wet Fly Ash Handling Information

Instructions: Make copies of Section 2.4 (Questions C2-24 through C2-36) for each *wet fly ash handling system* identified in Table C-2 using the "Copy Section 2.4" button below. Enter the fly ash handling system ID (use system IDs assigned in Table C-2) in the space above titled "Fly Ash Handling System ID".

CBI?
☐ Yes

C2-24. Provide information for the *wet fly ash handling system* in Table C-7. For the source of sluice water, you may enter more than one source from the following options:

- "IN" if *raw intake water* is used;
- "IN-Makeup" if raw intake water is only used as makeup;
- "TR" for use of *intake water* that has been *treated* on site prior to use;
- "TR-Makeup" if treated intake water is used only as makeup; and/or
- Process wastewater and/or treated wastewater described the code tables on the "Code Tables" tab provided at the end of this workbook

An example is provided in Table C-7 for a plant that uses the effluent from its ash pond (WWT-1, as would be defined in Part A) for fly ash sluicing and also makes up for losses with untreated river water (which is code IN-Makeup as shown above).

Table C-7. Process Wastewater Generated from Wet Fly Ash Handling Systems in 2009

Average Sluice Water Flow Rate (gpd)	Typical Duration AND Frequency of Sluicing (hpd AND dpy)	Source(s) of Sluice Water	Percent Contribution of Source to Sluice Water Flow
EXAMPLE:			
		WWT-1 Effluent	*90* %
14,400,000 gpd	*24* hpd	IN-Makeup	*10* %
	365 dpy	Combustion turbine cleaning (combustion gas por	%
		Other:	%

gpd	hpd dpy	Select Select Select Other:	% % % %
gpd	hpd dpy	Select Select Select Other:	% % % %

CBI?
☐ Yes

C2-25. Provide wet fly ash handling information in Table C-8, using the following definitions for column headings:

- Number of Dry-to-Wet Mixing Junctions: Indicate the number of "junctions" (also referred to as "separation points") where dry solids are sluiced.
- Distance(s) Between Hoppers and Dry-to-Wet Mixing Junction(s): Indicate the distance or distances (if there is more than one mixing junction) between the closest hopper(s) and the mixing junction(s).
- Distance Between Dry-to-Wet Junction(s) and Ash Pond or Other Final Destination: Indicate the distance(s) between the dry-to-wet mixing junction(s) and the final destination of the wet fly ash. Where one or more ponds are involved, indicate the distance to the end of the sluice pipe at the furthest ash pond.

Table C-8: Wet Fly Ash Handling in 2009

Number of Dry-to-Wet Mixing Junctions	Distance(s) Between Hoppers and Dry-to-Wet Mixing Junction(s)	Distance Between Dry-to-Wet Junction(s) and Ash Pond or Other Final Destination
EXAMPLE:		
	200 feet	*2,000* feet
2 junction(s)	*500* feet	*2,300* feet
	feet	feet
	feet	feet
	feet	feet
junction(s)	feet	feet
	feet	feet
	feet	feet
	feet	feet

CBI? ☐ Yes

C2-26. What is the destination(s) of the wet *fly ash sluice?* [Check all boxes that apply.]

☐ Immediately recycled back to plant process. Describe how the wet fly ash sluice is

☐ Transferred to on-site treatment system. Identify the type of treatment system belo

☐ Settling pond ☐ Constructed wetlan

☐ pH adjustment ☐ Other, spec

☐ Chemical precipi

☐ Discharged to surface water. Provide NPDES permitted outfall numbe

☐ Indirect discharge to a publicly or privately owned treatment works

☐ Other, expl

CBI? ☐ Yes

C2-27. For water sources that may be used as a source of *fly ash sluice* water (e.g., fresh intake, recycled process water), indicate the maximum chlorides concentration and the maximum solids percentage that is acceptable for the water to be used for those purposes. [Check all boxes that apply.]

☐ Chlorides concentration, less than: ppm

☐ Solids percentage, less than: ppm

☐ Other: : ppm

CBI? ☐ Yes

C2-28. Indicate the criteria that the plant uses to determine if a water source is unacceptable for use (*recycle/reuse*) as *fly ash sluice* water. If the criteria are dictated by engineering design, provide specific elements of the design that dictate use.

CBI? ☐ Yes

C2-29. Has the plant encountered any unscheduled generating unit outages caused by the wet fly ash handling system in the last five years?

○ Yes (Continue)

○ No (Skip to Question C2-31)

CBI? ☐ Yes

C2-30. Provide information on unscheduled generating unit outages caused by the wet fly ash handling system for each of the last five years.

Table C-9. Unscheduled Generating Unit Outages Caused by the Wet Fly Ash Handling System

	2005	2006	2007	2008	2009
Total days of outage					
Reason(s) for outage(s)					
Method(s) used to resolve outage(s)					

CBI? ☐ Yes

C2-31. Is the plant in the process of installing a dry fly ash handling system to handle some or all of the ash currently handled by the wet fly ash handling system?

◉ Yes Estimated shutdown time (days) required to bring dry fly ash handling system online: _____ (Skip to Question C2-33)

○ No (Continue to Question C2-32)

CBI?
☐ Yes

C2-32. Is the plant planning to install a dry fly ash handling system by December 31, 2020 to handle some or all of the ash currently handled by the wet fly ash handling system?

○ Yes — Estimated shutdown time (days) required to bring dry fly ash handling system online: _____ (Continue to Question C2-33)

◉ No — Skip to Question C2-35)

CBI?
☐ Yes

C2-33. Describe the modifications that will be required to install the dry fly ash handling system. [Check all boxes that apply.]

☐ Physical changes to facility
- ☐ Installation of pressure/vacuum system and piping
- ☐ Expansion of pressure/vacuum system and piping
- ☐ Installation of storage silos
- ☐ Modification of the silos to moisture-condition the ash
- ☐ Modification of the silos for ash transfer to railcars
- ☐ Modification of the silos for marketable ash
- ☐ Construction of haul roads
- ☐ Construction of rail track
- ☐ Construction of landfill
- ☐ Increasing landfill capacity
- ☐ Changes to air permit
- ☐ Other, explain: _____

☐ Changes in personnel/training, explain: _____

☐ Changes in ash disposal practices
- ☐ Storage of ash in landfill
- ☐ Marketing of ash
- ☐ Hauling ash to off-site storage
- ☐ Dust suppression activities
- ☐ Other, explain: _____

CBI? ☐ Yes

C2-34. Indicate the types of destinations expected for the dry fly ash from the planned system and the percentage of the dry fly ash that is expected to go to each destination. [Check all boxes that apply.]

☐ Marketed, sold, and/or given away

Select ▭ ____ % of the dry fly ash

If other, specify: ____

Select ▭ ____ % of the dry fly ash

If other, specify: ____

Select ▭ ____ % of the dry fly ash

If other, specify: ____

☐ Stored in landfills reported in Table A-6 ____ % of the dry fly ash

☐ Stored in landfills NOT reported in Table A-6 ____ % of the dry fly ash

☐ Other, specify: ____ ____ % of the dry fly ash

CBI? ☐ Yes

C2-35. Complete Table C-10 if the plant currently markets, sells, and/or gives away fly ash transported by wet sluicing from the fly ash handling system. For each destination, provide the tons, on a dry basis, of fly ash transported by wet sluicing that is marketed, sold, and/or given away. Also provide the gross revenue generated from marketing/selling the fly ash transported by wet sluicing for each destination.

Table C-10. Fly Ash Transported by Wet Sluicing from the Fly Ash Handling System Marketed/Sold in Calendar Years 2005, 2007, and 2009

Destination	Typical Percent Moisture of Fly Ash	2005		2007		2009	
		Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $
Concrete/Concrete Products/Grout	%						
Blended Cement/Raw Feed for Clinker	%						
Flowable Fill	%						
Structural Fills/Embankments	%						

Road Base/Sub-base	%						
Soil Modification/Stabilization	%						
Mineral Filler in Asphalt	%						
Snow and Ice Control	%						
Blasting Grit/Roofing Granules	%						
Mining Applications	%						
Waste Stabilization/Solidification	%						
Agriculture	%						
Aggregate	%						
Other:	%						
Other:	%						

CBI?
☐ Yes

C2-36. If the plant is not in the process of installing or planning to install a dry fly ash handling system, has a conversion/installation ever been considered or have cost estimates been previously obtained/developed for such a conversion/installation?

◯ Yes (Provide documentation/costs, for example, bid proposals or internal plant engineering estimates.)

◯ No (Skip to Section 2.5)

Note: All bid proposals and/or other documentation/costs originally submitted to the plant as CBI, should be marked CBI for the purpose of this collection request.

◯ I have attached documentation/costs.

◯ I did not attach documentation/costs. Below, explair

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
Fly Ash Handling System ID: Insert System ID

Part: C
Section Title: 2.5. Fly Ash Cost Information - Conveyance

Instructions: Complete Section 2.5 (Questions C2-37 through C2-42) for the conveyance portion of each fly ash handling system (wet or dry) identified in Table C-2 that was installed after January 1, 1985. Enter the fly ash handling system ID in the space provided above (use the fly ash handling system IDs assigned in Table C-2).

If you indicated in Question C2-31or C2-32 that the plant is either installing or planning to install a dry fly ash handling system, complete Section 2.5, and enter "Planned" in the Fly Ash Handling System ID space provided above.

Make copies of Section 2.5 for each fly ash handling system operated in 2009, being installed, or planned to be installed by December 31, 2020 using the "Copy Section 2.5" button below.

The conveyance portion of the fly ash handling system refers to the part of the system that conveys fly ash from the fly ash collection equipment (ESP or baghouse) of one or more generating units to intermediate or final storage (e.g., storage silos or ponds/impoundments). Common dry fly ash conveyance components include filter/separators, vacuum/pressure transfer stations, blowers, and associated high pressure piping (note that conveyance does NOT include storage or loading silos). Common wet fly ash components include sluicing equipment, associated piping, and pumps (note that conveyance does NOT include ponds/impoundments).

CBI?
☐ Yes

C2-37. Identify all components of the conveyance portion of the fly ash handling system. Provide the type of component and the number or length (e.g., length of any necessary piping) of each type of component in the system. Additionally, provide the capacity of each component. For example, provide volume for silos, horsepower for pumps and diameter for piping.

Table C-11. Fly Ash System Components - Conveyance

Individual Components	Number or Length (ft) of Components in the System	Component Capacity
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select

Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	

CBI?
☐ Yes

C2-38. Attach a block diagram that shows the entire fly ash handling system operations. Label the conveyance, intermediate storage (see Part C Section 2.6) and transport/disposal (see Part C Section 2.7) portions of the system. The diagram should include all key components indicated in Tables C-11 and C-14 and identify all intermediate and final ash storage destinations. Indicate the movement of ash as well as water through the system. If ash from other fly ash or bottom ash handling systems is combined with ash from this fly ash handling system, indicate where the ash is combined and the ash handling systems involved. Provide as many diagrams as necessary to convey this information. Include the plant name, plant ID, and the fly ash handling system ID in the upper right hand corner of the diagram.

☐ Diagram attached

CBI?
☐ Yes

C2-39. List all of the major components of the conveyance portion of the fly ash handling system that a contractor(s) constructed/installed (or will construct/install, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL components identified in Tabl

CBI?
☐ Yes

C2-40. List all of the operation and maintenance activities of the conveyance portion of the fly ash handling system that a contractor(s) oversees (or will oversee, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL operation and maintenance activities dealing with the conveyance portion of the

CBI?
☐ Yes

C2-41. Provide cost data in Table C-12 for the conveyance portion of the fly ash handling system, both for the system as originally installed and for any modifications to the system. Include all conveyance costs including costs for components in Table C-11 as well as control systems, pads and foundations, and all other ancillary equipment. For planned fly ash handling systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the plant incurred a land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased and installed all equipment for the conveyance portion of the fly ash handling system at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-12. Capital Cost for the Conveyance Portion of the Fly Ash Handling System

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (including site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (including property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		
Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/or				
Construction expenses (including temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI?
☐ Yes

C2-42. Provide annual (2009) O&M costs data in Table C-13 for the conveyance portion of the fly ash handling system. Provide best engineering estimates when actual data are not readily available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates and maintains the conveyance component of the fly ash handling system at the contractor's expense, the plant should fill out "$ 0" for O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table C-12 "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-13. O&M Cost for the Conveyance Portion of the Fly Ash Handling System for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption
Operating Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Materials	$		
Energy	$	$ per kWh	kWh/hr
Other:	$		
Other:	$		
Total O&M Cost (2009)	$		

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
Fly Ash Handling System ID: Insert System ID

Part: C
Section Title: 2.6. Fly Ash Cost Information - Intermediate Storage

Instructions: Complete Section 2.6 (Questions C2-43 through C2-51) for the intermediate storage portion of each fly ash handling system identified in Table C-2 that was installed after January 1, 1985. Enter the fly ash handling system ID in the space provided above (use the fly ash handling system IDs assigned in Table C-2).

If you indicated in Question C2-31 or C2-32 that the plant is either installing or planning to install a dry fly ash handling system, complete Section 2.6, and enter "Planned" in the Fly Ash Handling System ID space provided above.

Make copies of Section 2.6 for each fly ash handling system operated in 2009, being installed, or planned to be installed by December 31, 2020 using the "Copy Section 2.6" button below.

If you are instructed to skip forward to another section while completing this section for one fly ash handling system, be sure to complete this section for each other fly ash handling system operated in 2009, being installed, or planned to be installed by December 31, 2020.

The intermediate storage portion of the fly ash handling system refers to the facility/site where collected fly ash is stored after conveyance, prior to the ash being transported to final disposal. Dry fly ash intermediate storage typically consists of storage silos. Wet fly ash intermediate storage typically consists of ponds/impoundments.

Note that intermediate storage includes all equipment and operations associated with loading dry or moisture-conditioned ash into trucks or rail cars for transport. Intermediate storage also includes all ash dust suppression activities at the plant.

CBI? ☐ Yes

C2-43. Does the fly ash handling system use (or will it use, for planned systems) an intermediate storage facility/site?

- ◯ Yes (Continue)
- ◯ No (Skip to Section 2.7)

CBI? ☐ Yes

C2-44. Does the fly ash handling system share any intermediate storage components with another fly ash handling system or with a bottom ash handling system? For example, if fly ash and bottom ash are conveyed separately but stored in a common silo, the silo is considered a shared component.

- ◯ Yes, all intermediate storage components are shared with one or more other fly ash handling systems (e.g., all ash fr
  Provide fly ash handling system IDs, as assigned in Table C-2, for all systems sharing components _____ (Continue)
- ◯ Yes, some intermediate storage components are shared with one or more other fly ash handling systems (e.g., multiple silos are used to st
  Provide fly ash handling system IDs, as assigned in Table C-2, for all systems sharing components _____
  Indicate which components are shared _____ (Continue)
- ◯ Yes, some or all intermediate storage components are shared with one or m
  Provide bottom ash handling system IDs, as assigned in Table C-19, for all systems sharing components _____ (Skip to Section 2.7)
- ◯ No (Continue)

CBI? ☐ Yes

C2-45. Is a *pond/impoundment* unit or *pond/impoundment system* the intermediate storage site of the ash collected by the fly ash handling system?

◯ Yes (Skip to Section 3.1)

◯ No (Continue)

CBI? ☐ Yes

C2-46. Has cost information for the intermediate storage portion of the fly ash handling system already been provided in the cost information for another fly ash handling system?

◯ Yes, costs for all intermediate storage components of the fly ash handling syste

Indicate which fly ash handling system's intermediate storage cost information includes these costs (Skip to Section 2.7)

◯ Yes, costs for some intermediate storage components of the fly ash handlir

Indicate which fly ash handling system's intermediate storage cost information includes these costs

Estimate the capital costs associated with the shared intermediate storage components

Estimate the O&M costs associated with the shared intermediate storage components (Continue)

◯ No e)

CBI? ☐ Yes

C2-47. Identify all components, both separate and shared, of the intermediate storage portion of the fly ash handling system. Provide the type of component and the number of each type of component in the system. Additionally provide the capacity of each component, for example, provide volume for silos.

Table C-14. Fly Ash Handling System Components - Intermediate Storage

Individual Components		Number of Components in the System	Component Size	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	

Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	

CBI?
☐ Yes

C2-48. List all of the major components of the intermediate storage portion of the fly ash handling system that a contractor(s) constructed/installed (or will construct/install, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL components identified inTab

CBI?
☐ Yes

C2-49. List all of the operation and maintenance activities of the intermediate storage portion of the fly ash handling system that a contractor(s) oversees (or will oversee, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL operation and maintenance activities dealing with the intermediate storage portion of th

CBI?
☐ Yes

C2-50. Provide cost data in Table C-15 for the intermediate storage portion of the fly ash handling system, both for the system as originally installed and for any modifications to the system. Include all intermediate storage costs including costs for components in Table C-14 as well as control systems, pads and foundations, and all other ancillary equipment. For planned fly ash handling systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the plant incurred a land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased and installed all the equipment for the intermediate storage portion of the fly ash handling system at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-15. Capital Cost for the Intermediate Storage Portion of the Fly Ash Handling System

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (includes site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (includes property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		

Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/o				
Construction expenses (including temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI?
☐ Yes

C2-51. Provide annual O&M costs data in Table C-16 for the intermediate storage portion of the fly ash handling system. Provide best engineering estimates when actual data are not readily available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates and maintains the intermediate storage portion of the fly ash handling system at the contractor's expense, the plant should fill out "$ 0" for O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table C-15 "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-16. O&M Cost for the Intermediate Storage Portion of the Fly Ash Handling System for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption
Operating Labor (Water Trucks Only)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Operating Labor (All other operating costs)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Materials	$		
Energy	$	$ per kWh	kWh/hr
Other:	$		
Other:	$		
Total O&M Cost (2009)	$		

Plant ID:
Plant Name:
Fly Ash Handling System ID:

Part: C
Section Title: 2.7. Fly Ash Cost Information - Transport/Disposal

Instructions: Complete Section 2.7 (Questions C2-52 through C2-59) for the ash transport/disposal portion of each fly ash handling system identified in Table C-2 that was installed after
Enter the fly ash handling system ID in the space provided above (use the fly ash handling system IDs assigned in Table C-2).

If you indicated in Question C2-31 or C2-32 that the plant is either installing or planning to install a dry fly ash handling system, complete Section 2.7, and enter "Planned" ir
Handling System ID space provided above.

Make copies of Section 2.7 for each fly ash handling system operated in 2009, being installed, or planned to be installed by December 31, 2020 using the "Copy Section 2.7

If you are instructed to skip forward to another section while completing this section for one fly ash handling system, be sure to complete this section for each other fly ash h
operated in 2009, being installed, or planned to be installed by December 31, 2020.

The ash transport/disposal portion of the fly ash handling system refers to the transportation of ash from intermediate storage to final disposal.

An example of ash transport/disposal is transportation used to haul ash off site (e.g., ash that is marketed and shipped off site to a reuse application). Ash transport typically
consists of roads and vehicles that are used to transport the ash. The capital and O&M costs for ash transport/disposal may include the road or rail infrastructure (roads,
tracks, lights), the trucks and rail cars, the operation and maintenance costs associated with the trucks and rail cars, and ash disposal fees.

Note that capital and operation and maintenance costs associated with landfills/landfilling are requested in Part F and they should not be provided here in Section 2.7.

CBI?
☐ Yes

C2-52. Does the fly ash handling system share any transport/disposal components with another fly ash handling system or with a bottom ash handling system? For example, if fly a
are transported using the same trucks, the trucks are considered a shared component.

◯ Yes, all transport/disposal components are shared with one or more other fly ash handling systems (e.g., all
Provide fly ash handling system IDs, as assigned in Table C-2, for all systems sharing components _____ (Continue)

◯ Yes, some transport/disposal components are shared with one or more other fly ash handling syster
Provide fly ash handling system IDs, as assigned in Table C-2, for all systems sharing components _____
Indicate which components are shared _____ (Continue)

◯ Yes, some or all transport/disposal components are shared with one or more
Provide bottom ash handling system IDs, as assigned in Table C-19, for all systems sharing components _____ (Skip to Section

◯ No (Continue)

CBI?
☐ Yes

C2-53. Is a *pond/impoundment* unit or *pond/impoundment system* the final destination of the ash collected by the fly ash handling system?

◯ Yes (Skip to Section 3.1)

◯ No (Continue)

CBI?
☐ Yes

C2-54. Has cost information for the transport/disposal portion of the fly ash handling system already been provided in the cost information for another fly ash handling system?

○ Yes, costs for all transport/disposal components of the fly ash handling system have already been provided

Indicate which fly ash handling system's transport/disposal cost information includes these costs _____ (Skip to Section

○ Yes, costs for some transport/disposal components of the fly ash handling systems have already be

Indicate which fly ash handling system's transport/disposal cost information includes these costs _____

Estimate the capital costs associated with the shared transport/disposal components except for landfills _____

Estimate the O&M costs associated with the shared transport/disposal components except for landfills _____ (Continue)

○ No (Continue)

CBI?
☐ Yes

C2-55. What methods are used to transport the collected fly ash to the final disposal? [Check all boxes that apply.]

☐ Trucks

How many trucks does the plant use for the transportation and disposal of dry fly ash?

_____

Indicate whether the trucks were bought, leased or contracted out.

☐ Bought
☐ Leased
☐ Contracted out

☐ Rail ca

How many rail cars does the plant use for the transportation and disposal of dry fly ash?

_____

Indicate whether the rail cars were bought, leased or contracted out.

☐ Bought
☐ Leased
☐ Contracted out

☐ Other, specify (e. _____

CBI?
☐ Yes

C2-56. List all of the major components of the transport/disposal portion of the fly ash handling system that a contractor(s) constructed/installed (or will construct/install, for planned contractor's expense (i.e., not at the plant's expense).

_____

☐ Contractor installed/will install ALL ash transport/disposal equipment and/or infrastru

CBI?
☐ Yes

C2-57. List all of the operation and maintenance activities of the transport/disposal portion of the fly ash handling system that a contractor(s) oversees (or will oversee, for planned contractor's expense (i.e., not at the plant's expense).

_____

☐ Contractor oversees/will oversee ALL transport/disposal activities at the contractor's expense.

CBI?
☐ Yes

C2-58. Provide cost data in Table C-17 for the transport/disposal of the collected fly ash, both for the system as originally installed and for any modifications to the system. Include transport/disposal costs including costs for components in Table C-16 as well as control systems, pads and foundations, and all other ancillary equipment. For planned fly a systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note that capital costs associated with *landfills*/landfilling are requested in Part F. Do NOT include landfill costs in Table C-17.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased all rail cars and/or trucks fo transportation of the fly ash at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-17. Capital Cost for the Transport/Disposal of Collected Fly Ash

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (including site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (includes property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		

Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below:				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/or				
Construction expenses (includes temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI?
☐ Yes

C2-59. Provide annual O&M costs data in Table C-18 for the transport/disposal of the collected fly ash. Provide best engineering estimates when actual data are not readily availab an estimate, note the methods that were used to make the estimates in the Comments page.

Note that O&M costs associated with *landfills*/landfilling are requested in Part F. Do NOT include landfill costs in Table C-18.

Note: Provide only the cost data incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates the transportation and dispo the contractor's expense, the plant should fill out "$ 0" for the cost of all operating O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-18. O&M Cost for the Transport/Disposal Portion of the Fly Ash Handling System for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption	Tran
Operating Labor (Trucks/Rail Cars/Other Transport)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Operating Labor (All other operating costs)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Maintenance Materials	$			
Energy	$	$ per kWh	kWh/hr	
Ash Removal/Disposal Fees	$			
Other:	$			
Other:	$			
Total O&M Cost (2009)	$			

Insert Plant ID
Insert Plant Name
Insert System ID

· January 1, 1985.

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Loads per day dpy

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
SE Unit ID: Insert SE Unit ID

Part: C
Section Title: 3.2. Bottom Ash Handling - Unit Level Information

Instructions: Complete Section 3.2 (Questions C3-3 through C3-8) for each steam electric generating unit serviced in 2009 by a bottom ash handling system identified in Table C-19.

Make copies of Section 3.2 for each steam electric generating unit using the "Copy Section 3.2" button below. Enter the steam electric generating unit ID (use unit IDs assigned in Table A-8) in the space above titled "SE Unit ID".

CBI? ☐ Yes

C3-3. Indicate whether a *wet-bottom boiler* or a *dry-bottom boiler* is used in the steam electric generating unit.

◯ Wet-bottom bo
◯ Dry-bottom bo

CBI? ☐ Yes

C3-4. In Table C-20, indicate all of the bottom ash handling systems that serviced the steam electric generating unit in 2009. Addtionally, provide the percent of ash from the steam electric generating unit handled by each bottom ash handling system, and the number of days each system handled the ash in 2009. If the bottom ash handling system can service the unit, but did not handle any of its ash in 2009, enter 0% and 0 days.

Table C-20. Bottom Ash Handling Systems Servicing the Steam Electric Generating Unit

Bottom Ash Handling Systems Servicing the Steam Electric Generating Unit [Check all boxes that apply]	Percent of Ash Handled by the Bottom Ash Handling System in 2009 (Dry weight basis)	Number of Days Ash Handled by the Bottom Ash Handling System in 2009
☐ BA-1	%	
☐ BA-2	%	
☐ BA-3	%	
☐ BA-4	%	

☐ BA-5	%	
☐ BA-6	%	
☐ BA-7	%	
☐ BA-8	%	
☐ BA-9	%	
☐ BA-10	%	

CBI?
☐ Yes

C3-5. Was the bottom ash from this steam electric generating unit handled by both a *wet and dry bottom ash handling system* in 2009?

○ Yes (Continue)
○ No (Skip to Section 3.3)

CBI?
☐ Yes

C3-6. If ash from the steam electric generating unit was handled by both a wet and dry bottom ash handling systems in 2009, indicate why. [Check all boxes that apply.] For each selection, identify the number of days in 2009 the wet system was operated for this reason.

☐ Wet bottom ash handling system is operated during the times in which the dry collected bot ____ days
☐ Wet bottom ash handling system is operated when the dry bottom ash collection system is not opera ____ days
☐ Wet bottom ash handling system is operated in order to maintain its function as a backup to the dry system (i.e., wet system c ____ days
☐ Wet bottom ash handling system is operated because the dry bottom ash handling system does not have the capac ____ days
☐ Other, expla _____ ____ days

CBI?
☐ Yes

C3-7. If ash from the steam electric generating unit was handled by both a wet and dry bottom ash handling systems in 2009, what modifications would be required to operate all the bottom ash with the dry bottom ash handling system? [Check all boxes that apply.]

☐ No system modifications necessary. Procedural changes would be suf
☐ Increase the capacity of the silo(s).
☐ Increase the number of silos.
☐ Modify the loading silos to have the ability to moisture condition the
☐ Install/increase the capacity of landfills.
☐ Increase the capacity of the dry bottom ash conveying equipment.

☐ Design/develop new infrastructure to dispose of dry ash. Specify the new

☐ Other, expl

CBI?
☐ Yes

C3-8. If the current bottom ash handling operations for the steam electric generating unit are expected to change in future years, indicate how.

◯ Decrease the use of wet bottom ash handling s
Expected operating days per year

◯ End use of wet bottom ash handling system.
Expected end date

◯ No change in bottom ash handling operations.

◯ Other, explai

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
Bottom Ash Handling System ID: Insert System ID

Part: C
Section Title: 3.3. Dry Bottom Ash Handling Information

Instructions: Make copies of Section 3.3 (C3-9 through C3-20) for each *dry bottom ash handling system* identified in Table C-19 using the "Copy Section 3.3" button below. Enter the bottom ash handling system ID (use system IDs assigned in Table C-19) in the space above titled "Bottom Ash Handling System ID".

CBI? ☐ Yes

C3-9. Does the plant use a mechanical drag system (e.g., submerged chain conveyor (SCC)) to remove bottom ash from the generating unit boiler(s)?

◯ Yes (Skip to Question C3-10)
◯ No (Continue)

Name the type and describe the process of removing bottom ash from the generating unit boiler(s).

CBI? ☐ Yes

C3-10. Has the plant encountered any unscheduled generating unit outages caused by the dry bottom ash handling system in the last five years (e.g., submerged chain conveyor (SCC) system needed to be repaired due to falling boiler slag)?

◯ Yes ontinue)
◯ No (Skip to Question C3-12)

CBI? ☐ Yes

C3-11. In Table C-21, provide information on unscheduled generating unit outages caused by the dry bottom ash handling system for each of the last five years.

Table C-21. Unscheduled Generating Unit Outages Caused by the Dry Bottom Ash Handling System

	2005	2006	2007	2008	2009
Total days of outage					
Reason(s) for outage(s)					
Method(s) used to resolve outage(s)					

CBI? ☐ Yes

C3-12. Was the dry bottom ash handling system installed as-is at the same time the oldest generating unit it services was built?

- ◯ Yes (Skip to Question C3-18)
- ◯ No, it was a r (Continue)

Year Built: _____

Shutdown time (days) required to bring dry bottom ash handling system on line: _____

Was a generating unit outage(s), outside of regularly scheduled outages, required to bring the dry bottom ash handling system on line?

- ◯ Yes
- ◯ No

CBI? ☐ Yes

C3-13. What type of retrofit was the dry bottom ash handling system?

- ◯ The retrofit was made to an exi (Skip to Question C3-15)
- ◯ A dry bottom ash handling system was installed (for operation in addition (Continue)
- ◯ The retrofit was a complete conversion from a wet to dry bottor (Continue)

CBI? ☐ Yes

C3-14. Provide the reason(s) for the installation of the dry bottom ash handling system or the complete conversion from the wet handling system to the dry handling system. [Check all boxes that apply.]

☐ The plant had issues meeting its ash *pond/impoundment* effluent permit limitations.

Indicate which *pollutant(s)*:

- ☐ Hg
- ☐ Se
- ☐ As
- ☐ Othe _____

☐ The plant switched to a low sulfur coal (e.g., PRB coal) which caused issues in the sluice piping used to convey wet bottom ash to its ash pond(s), making dry bottom ash handling more feasible from an operational/cost perspective.

☐ The plant identified markets (housing/construction) for the dry-collected bottom ash, providing an additional source of revenue.

☐ The plant had been approaching the limit of the capacity of the ash pond(s)/impoundment(s) used to store the ash.

☐ Other, explain: _____

CBI? ☐ Yes

C3-15. Provide the reason(s) for the retrofit to the existing dry handling system. [Check all boxes that apply.]

- ☐ Reason(s) for retrofit described as a wet to dry conversion in Question C3-14. Skip to Question C3-16.
- ☐ The plant decided to moisture condition ash for transport/disposal.
- ☐ The plant had to install unloading equipment for marketable dry bottom ash.
- ☐ The plant wanted to increase the capacity of its dry bottom ash handling system.
- ☐ The plant identified new markets for dry-collected bottom ash.
- ☐ The demand from the plant's existing markets for the dry-collected bottom ash grew.
- ☐ Other, explain:

CBI? ☐ Yes

C3-16. Describe the changes that were required to retrofit (for a retrofit to an existing dry system, an installation of a dry system, or a complete conversion from wet to dry). [Check all boxes that apply.]

- ☐ Physical changes to facility
  - ☐ Installation of mechanical drag system
  - ☐ Boiler alteration to accommodate the mechanical drag system
  - ☐ Installation of completely dry bottom ash handling system
  - ☐ Installation of storage silos
  - ☐ Modification of the silos to moisture-condition the ash
  - ☐ Modification of the silos for ash transfer to rail cars
  - ☐ Modification of the silos for marketable ash
  - ☐ Construction of haul roads
  - ☐ Construction of rail track
  - ☐ Construction of landfill. Provide the landfill ID(s) from Table A-6:
  - ☐ Increasing landfill capacity. Provide the landfill ID(s) from Table A-6:
  - ☐ Changes to air permit
  - ☐ Other, explain:
- ☐ Changes in personnel/training,explain:
- ☐ Changes in ash disposal practices
  - ☐ Storage of ash in landfill
  - ☐ Marketing of ash
  - ☐ Hauling ash to off-site storage
  - ☐ Dust suppression activities
  - ☐ Other, explain:

CBI? ☐ Yes

C3-17. Attach an engineering process diagram(s) for the dry bottom ash handling system retrofit that depicts (with dimensions) the conveyance portion of the system (e.g., a diagram(s) that depicts how the dry bottom ash system is configured within the building to convey bottom ash from the boiler(s) to the building exit).

☐ Diagram attache

CBI?
☐ Yes

C3-18. Provide dry bottom ash storage information in Table C-22, using the following definitions for "Storage Destination":

Storage Destination 1: The storage device that the bottom ash immediately goes to from the bottom ash collection system (i.e., baghouse or ESP).

Storage Destination 2: An additional storage step for the bottom ash before end disposition. This row should only be completed if the ash does not reach end disposition after the first destination.

End (Final) Destination 3: The final storage destination of the ash. If the ash is deposited in more than one pond at the end disposition, provide an explanation on the Comments page.

For each storage destination, provide the distance the bottom ash is transported, the amount of bottom ash transported in 2009 (dry basis), and the percent moisture of the bottom ash. Additionally, for each destination indicate how the bottom ash is transported by entering one of the following options: conveyor belt/pipe, truck, barge, rail, or other (provide a description). If the bottom ash is sold to more than one destination (e.g., some bottom ash is sold for cement manufacturing and some is sold for structural fill) provide these percent moisture values in Table C-19 and enter the average percent moisture for all bottom ash sold in Table C-20.

Table C-22. Dry Bottom Ash Storage Information

Storage Destination	Type of Destination	Distance Transported (miles)	Tons of Bottom Ash Transported to Destination in 2009 (dry weight basis)	How is Bottom Ash Transported to Destination?	Percent Moisture of the Bottom Ash Entering Destination
Storage Destination 1	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
Storage Destination 2	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
End (Final) Destination 3	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%
	Select If other, explain:	miles	tons	Select If other, explain:	%

CBI?
☐ Yes

C3-19. Does the plant market, sell, and/or give away dry bottom ash from the dry ash handling system?

◯ Yes (Continue)

◯ No (Skip to Section 3.4)

CBI?
☐ Yes

C3-20. Complete Table C-23 if the plant markets, sells, and/or gives away dry bottom ash from the bottom ash handling system. For each destination, provide the tons of dry bottom ash marketed, sold, and/or given away, the gross revenue generated from mareting/selling the dry bottom ash for calendar years 2005, 2007, and 2009. Additionally, provide the typical percent moisture of the bottom ash during calendar years 2005, 2007, and 2009. If the typical percent moisture of the bottom ash was not constant during calendar years 2005, 2007, and 2009, note this information (include all typical percent moisture values for each year) in the Comments page.

Table C-23. Dry Bottom Ash from the Bottom Ash Handling System Marketed/Sold in Calendar Years 2005, 2007, and 2009

Destination	Typical Percent Moisture of Bottom Ash	2005		2007		2009	
		Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $
Concrete/Concrete Products/Grout	%						
Blended Cement/Raw Feed for Clinker	%						
Flowable Fill	%						
Structural Fills/Embankments	%						
Road Base/Sub-base	%						
Soil Modification/Stabilization	%						
Mineral Filler in Asphalt	%						
Snow and Ice Control	%						
Blasting Grit/Roofing Granules	%						
Mining Applications	%						
Waste Stabilization/Solidification	%						
Agriculture	%						
Aggregate	%						
Other:	%						
Other:	%						

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
Bottom Ash Handling System ID: Insert System ID

Part: C
Section Title: 3.4. Wet Bottom Ash Handling Information

Instructions: Make copies of Section 3.4 (Questions C3-21 through C3-36) for each *wet bottom ash handling system* identified in Table C-19 using the "Copy Section 3.4" button below. Enter the bottom ash handling system ID (use system IDs assigned in Table C-19) in the space above titled "Bottom Ash Handling System ID".

CBI?
☐ Ye

C3-21. Provide information for the wet bottom ash handling system in Table C-24. For the source of sluice water, you may enter more than one source from the following options:

- "IN" if *raw intake water* is used;
- "IN-Makeup" if raw intake water is only used as makeup;
- "TR" for use of *intake water* that has been *treated* on site prior to use;
- "TR-Makeup" if treated intake water is used only as makeup; and/or
- *Process wastewater* and/or treated wastewater described in the code tables on the "Code Tables" tab provided at the end of this workbook

An example is provided in Table C-24 for a plant that uses the effluent from its ash pond (WWT-1, as would be defined in Part A) for bottom ash sluicing and also makes up for losses with untreated river water (which is code IN-Makeup as shown above).

Table C-24. Process Wastewater Generated from Wet Bottom Ash Handling Systems in 2009

Average Sluice Water Flow Rate (gpd)	Typical Duration AND Frequency of Sluicing (hpd AND dpy)	Source(s) of Sluice Water	Percent Contribution of Source to Sluice Water Flow
EXAMPLE:			
14,400,000 gpd	*24* hpd *365* dpy	WWT-1 Effluent	*90* %
		IN-Makeup	*10* %
		Select	%
		Other:	%
gpd	hpd dpy	Select	%
		Select	%
		Select	%
		Other:	%
gpd	hpd dpy	Select	%
		Select	%
		Select	%
		Other:	%

CBI? ☐ Ye

C3-22. For water sources that may be used as a source of *bottom ash sluice* water (e.g., fresh intake, recycled process water), indicate the maximum chlorides concentration and the maximum solids percentage that is acceptable for the water to be used for those purposes. [Check all boxes that apply.]

☐ Chlorides concentration, less than: _____ ppm
☐ Solids percentage, less than: _____ ppm
☐ Other: _____ : _____ ppm

CBI? ☐ Ye

C3-23. Indicate the criteria that the plant uses to determine if a water source is unacceptable for use *(recycle/reuse)* as *bottom ash sluice* water. If the criteria are dictated by engineering design, provide specific elements of the design that dictate use.

_____

CBI? ☐ Ye

C3-24. Does solids removal (other than in pond(s)/impoundment(s)) occur at the plant?

◯ Yes (Skip to Question C3-26)
◯ No (Continue)

CBI? ☐ Ye

C3-25. Provide the destination(s) of the wet *bottom ash sluice* below [check all boxes that apply], and then skip to Question C3-29. (Skip to Question C3-29)

☐ Immediately recycled back to plant process. Describe how the we
_____
☐ Transferred to on-site treatment system. Identify the type of treatr
☐ Settling pond ☐ Constructed w
☐ pH adjustment ☐ Other, s _____
☐ Chemical pre
☐ Discharged to surface water. Provide NPDES permittec _____
☐ Indirect discharge to a publicly or privately owned tre
☐ Other, e _____

CBI? ☐ Ye

C3-26. In Table C-25 provide solids removal information, on a dry ton basis, for the wet ash sluice system. For the purpose of Table C-25, solids removal does NOT include ash ponds.

Table C-25. Wet Ash Sluice Systems Operated in 2009

Solids Removal [Check all boxes that apply]	Bottom Ash Disposal [Check all boxes that apply]	Amount (tons) of Solids Disposed (Dry weight basis)	Typical Percent Moisture of Bottom Ash Disposed
☐ Dewatering bin	☐ Sold or given away witho	_____ tons	_____ %
☐ Hydrocyclone	☐ Sold or given away after	_____ tons	_____ %
☐ Centrifug	☐ Stored in/transferred to a pond/impou	_____ tons	_____ %
☐ Filters	☐ Stored in landfills reportec	_____ tons	_____ %
☐ Othe _____	☐ Stored in landfills NOT reported in Table A-6	_____ tons	_____ %
	☐ Othe _____	_____ tons	_____ %

CBI? ☐ Ye

C3-27. Provide the amount of wastewater overflow from solids removal (e.g., dewatering bins) for the wet ash sluice system.

_____ gpd

CBI? ☐ Ye

C3-28. What is the destination(s) of the wastewater overflow from solids removal? If the plant recycles the wastewater, indicate the amount and the plant process to which this waste is recycled. [Check all boxes that apply.]

☐ Immediately recycled back to plant process.

Provide the amount of wastewater overflow that is recycled.

_____ gpd

Describe how the wastewater overflow is reused:

_____

☐ Transferred to on-site treatment system. Identify the type of treatr

☐ Settling pond ☐ Constructed w

☐ pH adjustment ☐ Other, s _____

☐ Discharged to surface water. Provide NPDES permittec _____

☐ Indirect discharge to a publicly or privately owned tre

☐ Other, e _____

CBI? ☐ Ye

C3-29. Has the plant encountered any unscheduled generating unit outages caused by the wet bottom ash handling system in the last five years?

◯ Yes (Continue)

◯ N((Skip to Question C3-31)

CBI? ☐ Ye

C3-30. In Table C-26, provide information on unscheduled generating unit outages caused by the wet bottom ash handling system for each of the last five years.

Table C-26. Unscheduled Generating Unit Outages Caused by the Wet Bottom Ash Handling System

	2005	2006	2007	2008	2009
Total days of outage					
Reason(s) for outage(s)					
Method(s) used to resolve outage(s)					

CBI? ☐ Ye

C3-31. Is the plant in the process of installing a dry bottom ash handling system to handle some or all of the ash currently handled by the wet bottom ash handling system?

◯ Yes timated shutdown time (days) required to bring dry bottom ash handling system online: _____ (Skip to Question C3-33)

◯ No ontinue to Question C3-32)

CBI? ☐ Ye

C3-32. Is the plant planning to install a dry bottom ash handling system to handle some or all of the ash currently handled by the wet bottom ash handling system?

○ Yes — Estimated shutdown time (days) required to bring dry bottom ash handling system online: _____ (Continue to Question C3-33)

○ No — (Skip to Question C3-35)

CBI? ☐ Ye

C3-33. Describe the modifications that will be required to install the dry bottom ash handling system. [Check all boxes that apply.]

☐ Physical changes to facility
- ☐ Installation of mechanical drag system
- ☐ Boiler alteration to accommodate the mechanical drag system
- ☐ Installation of completely dry bottom ash handling system
- ☐ Installation of storage silos
- ☐ Modification of the silos to moisture-condition the ash
- ☐ Modification of the silos for ash transfer to rail cars
- ☐ Modification of the silos for marketable ash
- ☐ Construction of haul roads
- ☐ Construction of rail track
- ☐ Construction of landfill
- ☐ Increasing landfill capacity
- ☐ Changes to air permit
- ☐ Other, explain: _____

☐ Changes in personnel/training, explain: _____

☐ Changes in ash disposal practices
- ☐ Storage of ash in landfill
- ☐ Marketing of ash
- ☐ Hauling ash to off-site storage
- ☐ Dust suppression activities
- ☐ Other, explain: _____

CBI? ☐ Ye

C3-34. Indicate the types of destinations expected for the dry bottom ash from the planned system and the percentage of the dry bottom ash that is expected to go to each destination. [Check all boxes that apply.]

☐ Marketed, sold, and/or given away
- Select _____ % of the dry bottom ash
- If other, specify: _____
- Select _____ % of the dry bottom ash
- If other, specify: _____
- Select _____ % of the dry bottom ash
- If other, specify: _____

☐ Stored in landfills reported in Table A-6 _____ % of the dry bottom ash

☐ Stored in landfills NOT reported in Table A-6 _____ % of the dry bottom ash

☐ Other, specify:

—

_____ _____ % of the dry bottom ash

CBI?

☐ Ye

C3-35. Complete Table C-27 if the plant currently markets, sells, and/or gives away bottom ash transported by wet sluicing from the bottom ash handling system. For each destination, provide the tons, on a dry basis, of bottom ash transported by wet sluicing that is marketed, sold, and/or given away. Also provide the gross revenue generated from marketing/selling the bottom ash transported by wet sluicing for each destination.

Table C-27. Bottom Ash Transported by Wet Sluicing from the Bottom Ash Handling System Marketed/Sold in Calendar Years 2005, 2007, and 2009

Destination	Typical Percent Moisture of Bottom Ash	2005		2007		2009	
		Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $	Tons (dry basis)	Gross Revenue Generated $
Concrete/Concrete Products/Grout	%						
Blended Cement/Raw Feed for Clinker	%						
Flowable Fill	%						
Structural Fills/Embankments	%						
Road Base/Sub-base	%						
Soil Modification/Stabilization	%						
Mineral Filler in Asphalt	%						
Snow and Ice Control	%						
Blasting Grit/Roofing Granules	%						
Mining Applications	%						
Waste Stabilization/Solidification	%						
Agriculture	%						
Aggregate	%						
Other:	%						
Other:	%						

CBI?
☐ Yes

C3-36. If the plant is not in the process of installing or planning to install a dry bottom ash handling system, has a conversion/installation ever been considered or have cost estimates been previously obtained/developed for such a conversion/installation?

◯ Yes (Provide documentation/costs, for example, bid proposals or internal plant engineering estimates.)

◯ No (Skip to Section 3.5)

Note: All bid proposals and/or other documentation/costs originally submitted to the plant as CBI, should be marked CBI for the purpose of this collection request.

◯ I have attached documentation/

◯ I did not attach documentation/costs. Bel

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
Bottom Ash Handling System ID: Insert System ID

Part: C
Section Title: 3.5. Bottom Ash Cost Information - Conveyance

Instructions: Complete Section 3.5 (Questions C3-37 through C3-42) for the conveyance portion of each bottom ash handling system (wet or dry) identified in Table C-19 that was installed after January 1, 1985. Enter the bottom ash handling system ID in the space provided above (use the bottom ash handling system IDs assigned in Table C-19).

If you indicated in Questions C3-31 or C3-32 that the plant is either installing or planning to install a dry bottom ash handling system, complete Section 3.5, and enter "Planned" in the Bottom Ash Handling System ID space provided above.

Make copies of Section 3.5 for each bottom ash handling system operated in 2009, being installed, or planned to be installed by December 31, 2020 using the "Copy Section 3.5" button below.

The conveyance portion of the bottom ash handling system refers to the part of the system that conveys bottom ash from the boiler(s) of one or more generating units to the intermediate or final storage of the bottom ash. Dry bottom ash handling includes systems that collect and convey the bottom ash without any use of water, as well as systems in which bottom ash is conveyed mechanically or pneumatically away from a quench water bath (e.g., submerged chain conveyor systems). Wet bottom ash conveyance uses water (i.e., a sluice) to convey bottom ash away from the boiler to intermediate/final storage (e.g., ponds/impoundments). Note that dewatering bins are considered part of bottom ash conveyance.

Note: Bottom ash conveyance includes all capital and O&M costs required to dredge or empty ponds, dewatering bins, and/or surge tanks to intermediate storage.

CBI?
☐ Yes

C3-37. Identify all components of the conveyance portion of the bottom ash handling system. Provide the type of component and the number or length (e.g., length of any necessary piping) of each type of component in the system.

Table C-28. Bottom Ash Handling System Components - Conveyance

Individual Components	Number or Length (ft) of Components in the System	Component Size
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:
Select		Select
Other:		If other, specify:

Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	
Select				Select	
Other:				If other, specify:	

CBI? ☐ Yes

C3-38. Attach a block diagram that shows the entire bottom ash handling system operations. Label the conveyance, intermediate storage (see Part C Section 3.6) and transport/disposal (see Part C Section 3.7) portions of the system. The diagram should include all key components indicated in Tables C-28 and C-31 and identify all intermediate and final ash storage destinations. Indicate the movement of ash as well as water through the system. If ash from other fly ash or bottom ash handling systems is combined with ash from this fly ash handling system, indicate where the ash is combined and the ash handling systems involved. Provide as many diagrams as necessary to convey this information. Include the plant name, plant ID, and the bottom ash handling system ID in the upper right hand corner of the diagram.

☐ Diagram attached

CBI? ☐ Yes

C3-39. List all of the major components of the conveyance portion of the bottom ash handling system that a contractor(s) constructed/installed (or will construct/install, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL components identified in Tab

CBI? ☐ Yes

C3-40. List all of the operation and maintenance activities of the conveyance portion of the bottom ash handling system that a contractor(s) oversees (or will oversee, for planned systems) at the contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL operation and maintenance activities dealing with the conveyance portion of the bottom ash

CBI? ☐ Yes

C3-41. Provide cost data in Table C-29 for the conveyance portion of the bottom ash handling system, both for the system as originally installed and for any modifications to the system. Include all conveyance costs including costs for components in Table C-28 as well as control systems, pads and foundations, and all other ancillary equipment. For planned bottom ash handling systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the plant incurred a land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Provide only the costs incurred to the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased and installed all equipment for the conveyance portion of the bottom ash handling system at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-29. Capital Cost for the Conveyance Portion of the Bottom Ash Handling System

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (includes site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (includes property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		
Indirect Costs				
Engineering Costs (includes process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/or				
Construction expenses (includes temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI?
☐ Yes

C3-42. Provide annual O&M costs data in Table C-30 for the conveyance portion of the bottom ash handling system. Provide best engineering estimates when actual data are not readily available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates and maintains the conveyance component of the bottom ash handling system at the contractor's expense, the plant should fill out "$ 0" for O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table C-29 "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-30. O&M Cost for the Conveyance Portion of the Bottom Ash Handling System for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption
Operating Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy
Maintenance Materials	$		
Energy	$	$ per kWh	kWh/hr
Other:	$		
Other:	$		
Total O&M Cost (2009)	$		

Plant ID:
Plant Name:
Bottom Ash Handling System ID:

Part: C
Section Title: 3.6. Bottom Ash Cost Information - Intermediate Storage

Instructions: Complete Section 3.6 (Questions C3-43 through C3-51) for the intermediate storage portion of each bottom ash handling system identified in Table C-19 that was installed aft
Enter the bottom ash handling system ID in the space provided above (use the bottom ash handling system IDs assigned in Table C-19).

If you indicated in Questions C3-31 or C3-32 that the plant is either installing or planning to install a dry bottom ash handling system, complete Section 3.6, and enter "Planne
Handling System ID space provided above.

Make copies of Section 3.6 for each bottom ash handling system operated in 2009, being installed, or planned to be installed by December 31, 2020 using the "Copy Section

If you are instructed to skip forward to another section while completing this section for one bottom ash handling system, be sure to complete this section for each other bottor
system operated in 2009, being installed, or planned to be installed by December 31, 2020.

The intermediate storage portion of the bottom ash handling system refers to the facility/site where collected bottom ash is stored after conveyance, prior to the ash being tran
disposal. Dry bottom ash intermediate storage typically consists of stackout/holding areas for the bottom ash collected from mechanical drag systems. Wet bottom ash interme
typically consists of ponds/impoundments.

Note that intermediate storage includes all equipment and operations associated with loading dry, moisture-conditioned, or dewatered bottom ash into trucks or rail cars
for transport. Intermediate storage also includes all ash dust suppression activities at the plant.

CBI? ☐ Yes

C3-43. Does the bottom ash handling system use (or will it use, for planned systems) an intermediate storage facility/site?

- ◯ Yes (Continue)
- ◯ No (Skip to Section 3.7)

CBI? ☐ Yes

C3-44. Does the bottom ash handling system share any intermediate storage components with another bottom ash handling system or with a fly ash handling system? For example, ash are conveyed separately but stored in a common silo, the silo is considered a shared component.

- ◯ Yes, all intermediate storage components are shared with one or more other bottom ash handling systems (e
  Provide bottom ash handling system IDs, as assigned in Table C-19, for all systems sharing components _____ (Continue)
- ◯ Yes, some intermediate storage components are shared with one or more other bottom ash handling systems (e.g., multiple silos are used to
  Provide bottom ash handling system IDs, as assigned in Table C-19, for all systems sharing components _____
  Indicate which components are shared _____ (Continue)
- ◯ Yes, some or all intermediate storage components are shared with one or n(Skip to Section 3.7)
- ◯ No e)

CBI? ☐ Yes

C3-45. Is a *pond/impoundment* unit or *pond/impoundment system* the intermediate storage destination of the ash collected by the bottom ash handling system?

- ◯ Yes (Skip to Section 4.1)
- ◯ No (Continue)

CBI?
☐ Yes

C3-46. Has cost information for the intermediate storage portion of the bottom ash handling system already been provided in the cost information for another bottom ash handling sys

◯ Yes, costs for all intermediate storage components of the bottom ash handling system have already been
Indicate which bottom ash handling system's intermediate storage cost information includes these costs (Skip to Section 3.7)

◯ Yes, costs for some intermediate storage components of the bottom ash handling systems have a
Indicate which bottom ash handling system's intermediate storage cost information includes these costs
Estimate the capital costs associated with the shared intermediate storage components
Estimate the O&M costs associated with the shared intermediate storage components (Continue)

◯ No (Skip to Section 3.7)

CBI?
☐ Yes

C3-47. Identify all components of the intermediate storage portion of the bottom ash handling system. Provide the type of component and the number of each type of component in th

Table C-31. Bottom Ash Handling System Components - Intermediate Storage

Individual Components		Number of Components in the System	Component Size	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
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Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	
Select			Select	
Other:			If other, specify:	

CBI?
☐ Yes

C3-48. List all of the major components of the intermediate storage portion of the bottom ash handling system that a contractor(s) constructed/installed (or will construct/install, for pla
the contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL components identified inTable

CBI?
☐ Yes

C3-49. List all of the operation and maintenance activities of the intermediate storage portion of the bottom ash handling system that a contractor(s) oversees (or will oversee, for plar
contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL operation and maintenance activities dealing with the intermediate storage portion of

CBI?
☐ Yes

C3-50. Provide cost data in Table C-32 for the intermediate storage portion of the bottom ash handling system, both for the system as originally installed and for any modifications to
all intermediate storage costs including costs for components in Table C-31 as well as control systems, pads and foundations, and all other ancillary equipment. For planned b
systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if th
land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased and installed all the equipment fo
storage portion of the bottom ash handling system at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees i
should be accounted for in the "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-32. Capital Cost for the Intermediate Storage Portion of the Bottom Ash Handling System

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		

Site preparation (including site clearing, all demolition, grading, roads, walking areas, fences)	$		$	
Land (including property costs and survey fees)	$		$	
Total Direct Costs	**$**		**$**	
Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$		$	
b. Owner's Overhead Engineering Costs	$		$	
☐ Hired outside engineering firm to oversee design and/o				
Construction expenses (including temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$		$	
Other Contractor's Fees	$		$	
Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$		$	
Total Indirect Costs	**$**		**$**	
Total Capital Cost	**$**		**$**	

CBI?
☐ Yes

C3-51. Provide annual O&M costs data in Table C-33 for the intermediate storage portion of the bottom ash handling system. Provide best engineering estimates when actual data ar available. If you provide an estimate, note the methods that were used to make the estimates in the Comments page.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates and maintains the intermediate stc bottom ash handling system at the contractor's expense, the plant should fill out "$ 0" for O&M costs. Any contractor costs/fees incurred by the plant should be accounted for "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-33. O&M Cost for the Intermediate Storage Portion of the Bottom Ash Handling System for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing
Operating Labor (Water Trucks Only)	$	$ Per hour (average rate of labor)	
Operating Labor (All other operating costs)	$	$ Per hour (average rate of labor)	
Maintenance Labor	$	$ Per hour (average rate of labor)	
Maintenance Materials	$		
Energy	$	$ per kWh	
Other:	$		
Other:	$		
Total O&M Cost (2009)	$		

Insert Plant ID
Insert Plant Name
Insert System ID

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/Consumption
No. of workers
hpd
dpy
No. of workers
hpd
dpy
No. of workers
hpd
dpy
kWh/hr

Plant ID:
Plant Name:
Bottom Ash Handling System ID:

Part: C
Section Title: 3.7. Bottom Ash Cost Information - Transport/Disposal

Instructions: Complete Section 3.7 (Questions C3-52 through C3-59) for the ash transport/disposal portion of each bottom ash handling system identified in Table C-19 that was installed aft 1985. Enter the bottom ash handling system ID in the space provided above (use the bottom ash handling system IDs assigned in Table C-19).

If you indicated in Questions C3-31 or C3-32 that the plant is either installing or planning to install a dry bottom ash handling system, complete Section 3.7, and enter "Planned" Handling System ID space provided above.

Make copies of Section 3.7 for each bottom ash handling system operated in 2009, being installed, or planned to be installed by December 31, 2020 using the "Copy Section 3.

If you are instructed to skip forward to another section while completing this section for one bottom ash handling system, be sure to complete this section for each other bottom system operated in 2009, being installed, or planned to be installed by December 31, 2020.

The ash transport/disposal portion of the bottom ash handling system refers to the transportation of ash from intermediate storage to final disposal.

An example of ash transport/disposal is transportation used to haul ash off site (e.g., ash that is marketed and shipped off site to a reuse application). Ash transport typically cor vehicles that are used to transport the ash. The capital and O&M costs for ash transport/disposal may include the road or rail infrastructure (roads, tracks, lights), the trucks and operation and maintenance costs associated with the trucks and rail cars, and ash disposal fees.

Note that capital and operation and maintenance costs associated with landfills/landfilling are requested in Part F and they should not be included here in Section 3.7.

CBI?
☐ Ye

C3-52. Does the bottom ash handling system share any transport/disposal components with another bottom ash handling system or with a fly ash handling system? For example, if fly ash are transported using the same trucks, the trucks are considered a shared component.

◯ Yes, all transport/disposal components are shared with one or more other bottom ash handling systems (e.g.
Provide bottom ash handling system IDs, as assigned in Table C-19, for all systems sharing components _____ (Continue)

◯ Yes, some transport/disposal components are shared with one or more other bottom ash handling syst
Provide bottom ash handling system IDs, as assigned in Table C-19, for all systems sharing components _____
Indicate which components are shared _____ (Continue)

◯ Yes, some or all transport/disposal components are shared with one or mor (Skip to Section 4.1)

◯ No (Continue)

CBI?
☐ Yes

C3-53. Is a *pond/impoundment* unit or *pond/impoundment system* the final destination of the ash collected by the bottom ash handling system?

◯ Yes (Skip to Section 4.1)

◯ No (Continue)

CBI?
☐ Yes

C3-54. Has cost information for the transport/disposal portion of the bottom ash handling system already been provided in the cost information for another bottom ash handling system?

◯ Yes, costs for all transport/disposal components of the bottom ash handling system have already been pro
Indicate which bottom ash handling system's transport/disposal cost information includes these costs _____ (Skip to Section 4.1)

◯ Yes, costs for some transport/disposal components of the bottom ash handling systems have alrea
Indicate which bottom ash handling system's transport/disposal cost information includes these costs _____
Estimate the capital costs associated with the shared transport/disposal components except for landfills _____
Estimate the O&M costs associated with the shared transport/disposal components except for landfills _____ (Continue)

◯ No (Continue)

CBI?
☐ Yes

C3-55. What methods are used to transport the collected bottom ash to the final disposal? [Check all boxes that apply.]

☐ Trucks
How many trucks does the plant use for the transportation and disposal of dry bottom ash?

Indicate whether the trucks were bought, leased or contracted out.
☐ Bought
☐ Leased
☐ Contracted out

☐ Rail ca
How many rail cars does the plant use for the transportation and disposal of dry bottom ash?

Indicate whether the rail cars were bought, leased or contracted out.
☐ Bought
☐ Leased
☐ Contracted out

☐ Other, specify (e

CBI?
☐ Yes

C3-56. List all of the major components of the transport/disposal portion of the bottom ash handling system that a contractor(s) constructed/installed (or will construct/install, for planned contractor's expense (i.e., not at the plant's expense).

☐ Contractor installed/will install ALL ash transport/disposal equipment and/or infras

CBI?
☐ Yes

C3-57. List all of the operation and maintenance activities of the transport/disposal portion of the bottom ash handling system that a contractor(s) oversees(or will oversee, for planned contractor's expense (i.e., not at the plant's expense).

☐ Contractor oversees/will oversee ALL transport/disposal activities at the contractor's expense.

CBI?
☐ Yes

C3-58. Provide cost data in Table C-34 for the transport/disposal of the collected bottom ash, both for the system as originally installed and for any modifications to the system. Include transport/disposal costs incldluing costs for components in Table C-33 as well as control systems, pads and foundations, and all other ancillary equipment. For planned bottom a systems, provide expected costs. Provide the best engineering estimates when actual data are not readily available. For all costs, do not adjust for inflation. For example, if the land cost in 2002, enter the cost in the "Cost" column and enter "2002" in the "Year on which Cost is Based" column.

Note that capital costs associated with *landfills*/landfilling are requested in Part F. Do NOT include landfill costs in Table C-34.

Note: Provide only the costa incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor purchased all rail cars and/or trucks for the tra bottom ash at the contractor's expense, the plant should fill out "$ 0" for the cost of "Purchased Equipment". Any contractor costs/fees incurred by the plant should be accounted "Engineering Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-34. Capital Cost for the Transport/Disposal of Collected Bottom Ash

Project	Cost for System as Originally Installed	Cost for Modifications to System	Year on Which Cost is Based	
			Original Cost	Modification Cost
Direct Costs				
Purchased equipment (including all equipment for the installation or the upgrade: mechanical equipment; piping; instrumentation; electrical equipment; spare parts; freight charges; taxes; insurance; and duties)	$	$		
Purchased equipment installation (including installation of all equipment; piping; instrumentation/calibration; electrical equipment; mechanical equipment; structural supports, insulation, and paint)	$	$		
Buildings (including buildings constructed to house ash handling system components, operator rooms, or other operations associated with the system; as well as plumbing, heating, ventilation, dust collection, air conditioning, lighting, telephones, intercoms, painting, sprinklers, fire alarms)	$	$		
Site preparation (including site clearing, all demolition, grading, roads, walking areas, fences)	$	$		
Land (includes property costs and survey fees)	$	$		
Total Direct Costs	**$**	**$**		
Indirect Costs				
Engineering Costs (including process design and general engineering, cost engineering, consulting fees, supervision, inspection for each category below)				
a. Engineering Contract Firm Costs	$	$		
b. Owner's Overhead Engineering Costs	$	$		
☐ Hired outside engineering firm to oversee design and/o				
Construction expenses (including temporary construction offices, roads, communications, fencing; construction tools and equipment; permits, taxes, insurance)	$	$		
Other Contractor's Fees	$	$		

Contingency actually expended (to compensate for unpredictable events such as storms, floods, strikes, price changes, errors in estimates, design changes, etc.)	$	$		
Total Indirect Costs	**$**	**$**		
Total Capital Cost	**$**	**$**		

CBI?
☐ Yes

C3-59. Provide annual O&M costs data in Table C-35 for the transport/disposal of the collected bottom ash. Provide best engineering estimates when actual data are not readily availal an estimate, note the methods that were used to make the estimates in the Comments page.

Note that O&M costs associated with *landfills*/landfilling are requested in Part F. Do NOT include landfill costs in Table C-35.

Note: Provide only the costs incurred by the PLANT, not the costs paid for by the contractor. For example, if an outside contractor operates the transportation and disposal of th contractor's expense, the plant should fill out "$ 0" for the cost of all operating O&M costs. Any contractor costs/fees incurred by the plant should be accounted for in the Table Contract Firm Costs" and "Other Contractor's Fees" categories.

Table C-35. O&M Cost for the Transport/Disposal Portion of the Bottom Ash Handling System for 2009

O&M Cost Category	2009 Annual Cost	2009 Rate	2009 Staffing/Consumption	Trans
Operating Labor (Trucks/Rail Cars/Other Transport)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Operating Labor (All other operating costs)	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Maintenance Labor	$	$ Per hour (average rate of labor)	No. of workers hpd dpy	
Maintenance Materials	$			
Energy	$	$ per kWh	kWh/hr	
Ash Removal/Disposal Fee	$			
Other:	$			
Other:	$			
Total O&M Cost (2009)	$			

Insert Plant ID
Insert Plant Name
Insert System ID

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C-34 "Engineering

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Loads per day dpy

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
SE Unit ID: Insert SE Unit ID

Part: C
Section Title: 5. Economizer Ash Handling Information

Instructions: Make copies of Section 5 (Questions C5-1 through C5-5) for each fossil-fueled steam electric generating unit at your plant that generates economizer ash using the "Copy Section 5" button below. See Part A Section 8 for steam electric generating unit fuel classifications. Enter the steam electric generating unit ID (use unit IDs assigned in Table A-8) in the space above titled "SE Unit ID".

CBI? ☐ Yes

C5-1. Is economizer ash from this fossil-fueled steam electric generating unit collected with air heater ash?

- ◯ Yes (Complete the remainder of Section 5 for economizer and air heater ash together. Do NOT complete Section 6.)
- ◯ No (Continue)

CBI? ☐ Yes

C5-2. Indicate the method of handling the economizer ash.

- ◯ Segregated from fly and bo
  Describe how the segregated ash was handled: _____ (Skip to Question C5-4)
- ◯ Combined with fly and/or bot (Continue)

CBI? ☐ Yes

C5-3. Identify how the economizer ash is combined with fly ash and/or bottom ash.

- ◯ Handled wet, with fly
- ◯ Handled wet, with bot
- ◯ Handled dry, with fly
- ◯ Handled dry, with bot
- ◯ Other, explain:

_____

CBI? ☐ Yes

C5-4. Provide the average amount of dry economizer ash produced.

_____ tpd (dry weight basis)

_____ dpy

CBI?
☐ Yes

C5-5. Is process wastewater generated from the handling of economizer ash?

○ Yes (Continue)

○ No (Skip to Section 6)

Provide the volume of economizer ash wastewater generated in 2009 (gpd) and the frequency of economizer ash wastewater generation (days).

_____ gpd Over _____ days

Provide the destination of the economizer ash wastewater generated: Select

CBI?
☐ Yes

C5-6. What is the final disposition/destination of the collected economizer ash? [Check all boxes that apply.] Indicate the percentage of economizer ash transported to each destination.

☐ Stored in a landfill reported i _____ % of economizer ash

☐ Stored in a pond/impoundment reported in Table A-4 _____ % of economizer ash

☐ Stored in a landfill NOT reported in Tabl _____ % of economizer ash

☐ Hauled off site (to be m _____ % of economizer ash

☐ Hauled off site (to be gi _____ % of economizer ash

☐ Othe _____ _____ % of economizer ash

Plant ID: Insert Plant ID
Plant Name: Insert Plant Name
SE Unit ID: Insert SE Unit ID

Part: C
Section Title: 6. Air Heater Ash Handling Information

Instructions: Make copies of Section 6 (Questions C6-1 through C6-4) for each fossil-fueled steam electric generating unit at your plant that generates air heater ash using the "Copy Section 6" button below. See Part A Section 8 for steam electric generating unit fuel classifications. Enter the steam electric generating unit ID (use unit IDs assigned in Table A-8) in the space above titled "SE Unit ID".

CBI? ☐ Yes

C6-1. Indicate the method of handling the air heater ash.

○ Segregated from fly and bo
Describe how the segregated ash was handled: _____ (Skip to Question C6-3)

○ Combined with fly and/or bot (Continue)

CBI? ☐ Yes

C6-2. Identify how the air heater ash is combined with fly ash and/or bottom ash.

○ Handled wet, with fly
○ Handled wet, with bot
○ Handled dry, with fly
○ Handled dry, with bot
○ Other, explain:
_____

CBI? ☐ Yes

C6-3. Provide the average amount of dry air heater ash produced.

_____ tpd (dry weight basis)
_____ dpy

CBI? ☐ Yes

C6-4. Is process wastewater generated from the handling of air heater ash?

○ Yes (Continue)

○ No (Skip to next Questionnaire Part)

Provide the volume of air heater ash wastewater generated in 2009 (gpd) and the frequency of air heater ash wastewater generation (days).

_____ gpd Over _____ days

Provide the destination of the air heater ash wastewater generated: Select

CBI? ☐ Yes

C6-5. What is the final disposition/destination of the collected air heater ash? [Check all boxes that apply.] Indicate the percentage of air heater ash transported to each destination.

☐ Stored in a landfill reported	_____ % of air heater ash
☐ Stored in a pond/impoundment reported in Table A-4	_____ % of air heater ash
☐ Stored in a landfill NOT reported in Tab	_____ % of air heater ash
☐ Hauled off site (to be m	_____ % of air heater ash
☐ Hauled off site (to be gi	_____ % of air heater ash
☐ Othe _____	_____ % of air heater ash

Wet/Dry
Select
Wet
Dry

Storage Destination Table
Select
Silo 1
Silo 2
Silo 3
Silo 4
Silo 5
Outdoor Pile 1
Outdoor Pile 2
Outdoor Pile 3
Outdoor Pile 4
Outdoor Pile 5
Impoundment/Pond 1
Impoundment/Pond 2
Impoundment/Pond 3
Impoundment/Pond 4
Impoundment/Pond 5
Marketed, sold or given away
Stored in landfills reported in Table A-6
Stored in landfills NOT reported in Table A-6
Other

Destination Codes Table
Select
Burned on site
Deep-well injection
Discharge to POTW
Discharge to PrOTW
Discharge to surface water
Evaporation
Hauled off site for reuse (removal fee)
Hauled off site for reuse (given away)
Hauled off site for reuse (marketed and sold)
Hauled off site for disposal
Mixed with fly ash for disposal
On-site landfill (as reported in Table A-6)
POND-1
POND-2
POND-3
POND-4
POND-5

POND-6
POND-7
POND-8
POND-9
POND-10
POND-A
POND-B
POND-C
WWT-1
WWT-2
WWT-3
WWT-4
WWT-5
WWT-6
WWT-A
WWT-B
WWT-C
Reuse as boiler water
Reuse as bottom ash sluice
Reuse as combined ash sluice
Reuse as FGD slurry preparation water
Reuse as FGD absorber makeup
Reuse as fly ash sluice
Reuse as mill reject sluice
Reuse in cooling towers

Sluice Water Source
Select
IN
IN-Makeup
TR
TR-Makeup
Air heater cleaning water
Ash pile runoff
Boiler blowdown
Boiler fireside cleaning water
Boiler tube cleaning water
Bottom ash sluice
Carbon capture wastewater
Coal pile runoff
Combined ash sluice
Combustion turbine cleaning (combustion gas portion of turbine) water
Combustion turbine cleaning (compressor portion of the turbine) water
Combustion turbine evaporative coolers blowdown

Cooling tower blowdown
FGD scrubber purge
FGD slurry blowdown
Filter Backwash
Floor drain wastewater
Flue gas mercury control system wastewater
Fly ash sluice
General runoff
Gypsum pile runoff
Gypsum wash water
Ion exchange wastewater
Landfill runoff - capped landfill
Landfill runoff - uncapped landfill
Leachate
Limestone pile runoff
Mill reject sluice
Once -through cooling water
Reverse osmosis reject water
SCR catalyst regeneration wastewater
SCR catalyst washing wastewater
Soot blowing wash water
Steam turbine cleaning water
Yard drain wastewater
POND-1 Effluent
POND-2 Effluent
POND-3 Effluent
POND-4 Effluent
POND-5 Effluent
POND-6 Effluent
POND-7 Effluent
POND-8 Effluent
POND-9 Effluent
POND-10 Effluent
POND-A Effluent
POND-B Effluent
POND-C Effluent
WWT-1 Effluent
WWT-2 Effluent
WWT-3 Effluent
WWT-4 Effluent
WWT-5 Effluent
WWT-6 Effluent
WWT-A Effluent
WWT-B Effluent
WWT-C Effluent

Process Wastewaters
Select
Air heater cleaning water
Ash pile runoff
Boiler blowdown
Boiler fireside cleaning water
Boiler tube cleaning water
Bottom ash sluice
Carbon capture wastewater
Coal pile runoff
Combined ash sluice
Combustion turbine cleaning (combustion gas portion of turbine) water
Combustion turbine cleaning (compressor portion of the turbine) water
Combustion turbine evaporative coolers blowdown
Cooling tower blowdown
FGD scrubber purge
FGD slurry blowdown
Filter Backwash
Floor drain wastewater
Flue gas mercury control system wastewater
Fly ash sluice
General runoff
Gypsum pile runoff
Gypsum wash water
Ion exchange wastewater
Landfill runoff - capped landfill
Landfill runoff - uncapped landfill
Leachate
Limestone pile runoff
Mill reject sluice
Once -through cooling water
Reverse osmosis reject water
SCR catalyst regeneration wastewater
SCR catalyst washing wastewater
Soot blowing wash water
Steam turbine cleaning water
Yard drain wastewater
Other

Fly Ash Conveyance Components
Select
Airlock valve
Ash booster pump station
Baghouse for filter/separator

Bin vent filter
Branch line isolation valve
Dewatering bin
Filter/separator
Fugitive dust collection system with fan
High pressure piping
Material handling valve
Other valves
Piping (including supports/guides/anchors)
Pressure blower
Pump
Vacuum/pressure station/tank
Wet vacuum equipment (e.g., hydroveyor)
Dry vacuum equipment (e.g., mechanical exhauster)
Other

Fly Ash Intermediate Storage Components
Select
Air slide
Baghouse for silos
Bin vent filter
Bucket conveyor
Conditioned load out spout with dust collection system
Conveyor system
Dust suppresion (e.g., water truck)
Dry load out spout
Loading silo
Pug mill/pin mixer
Storage hopper
Storage silo
Vacuum loading equipment
Other

Fly Ash Transport Methods
Select
Barge
Conveyor belt/pipe
Rail
Truck
Other

Bottom Ash Conveyance Components
Select
Ash booster pump station
Baghouse for filter/separator
Bin vent filter

Branch line isolation valve
Clarifying tank
Conveying pipeline/valves (including supports/guides/anchors)
Crusher
Dewatering bin
Dry hopper system
Filter/separator
Fugitive dust collection system with fan
High pressure pump
Mechanical drag system
Other valves
Pressure blower
Pump
Remote dry flight conveyor
Surge tank
Vacuum equipment
Other

Bottom Ash Intermediate Storage Components
Select
Air slide
Baghouse for silos
Bin vent filter
Bucket conveyor
Conditioned load out spout with dust collection system
Dust suppresion (e.g., water truck)
Dry load out spout
Loading silo
Pug mill/pin mixer
Stackout/holding areas
Storage bin
Storage silo
Vacuum loading equipment
Other

Bottom Ash Transport Methods
Select
Barge
Conveyor belt/pipe
Rail
Truck
Other

Market Destinations
Select
Aggregate

Agriculture
Blasting Grit/Roofing Granules
Blended Cement/Raw Feed for Clinker
Concrete/Concrete Products/Grout
Flowable Fill
Mineral Filler in Asphalt
Mining Applications
Road Base/Sub-base
Snow and Ice Control
Soil Modification/Stabilization
Structural Fills/Embankments
Waste Stabilization/Solidification
Other

Units
Select
gpd
gpy

Component Units
Select
gal
hp
in
Other

Combined Intermediate Storage Components
Select
Air slide
Baghouse for silos
Bin vent filter
Bucket conveyor
Conditioned load out spout with dust collection system
Conveyor system
Dust suppresion (e.g., water truck)
Dry load out spout
Loading silo
Pug mill/pin mixer
Stackout/holding areas
Storage bin
Storage hopper
Storage silo
Vacuum loading equipment
Other