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Subpart AA - Pulp and Paper Manufacturing

 A printer-friendly version (pdf) (33 pp, 17,027K) of GHG reporting instructions for this subpart

Please select a help topic from the list below:

- [Using e-GGRT to Prepare Your Subpart AA Report](#)
 - [Subpart AA Summary Information for this Facility](#)
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 - [Subpart AA Emissions Information for Units Monitored by CEMS](#)
- [Using Subpart AA Calculation Spreadsheets](#)
- [Carry forward of data from previous submissions into RY2012 forms](#)
- [Subpart AA Rule Guidance](#)
- [Subpart AA Rule Language \(eCFR\)](#)

Additional Resources:

- [Part 98 Terms and Definitions](#)
- [Frequently Asked Questions \(FAQs\)](#)
- [Webinar Slides](#)

Using e-GGRT to Prepare Your Subpart AA Report

Subpart AA consists of facilities that produce market pulp, manufacture pulp and paper, produce paper products from purchased pulp, produce secondary fiber from recycled paper, and convert paper into paperboard products.

This page provides an overview of subtopics that are central to Subpart AA reporting:

- [Subpart AA Summary Information for this Facility](#)
- [Subpart AA Makeup Chemical Usage Information](#)
- [Subpart AA Process Unit Information](#)
- [Subpart AA Emissions Information](#)
- [Subpart AA Validation Report](#)

The end of the page contains links you can use for more information on these topics.

If you previously reported for Reporting Year (RY) 2011, the Agency has carried some of your RY2011 data forward and entered it in your RY2012 forms to reduce the reporting burden. It is still your responsibility to review and ensure that all of the information in your submission is correct, but the Agency believes that most of the data which is carried forward is unlikely to change significantly from year to year. For more information about carry forward data, please see the [Carry forward of data from previous submissions into RY2012 forms](#) help content.

Subpart AA Summary Information for this Facility

Subpart AA requires you to report the following data about your facility:

- The annual steam purchases (pounds)
- The annual production of pulp products (metric tons)
- The annual production of paper products (metric tons)

Subpart AA Makeup Chemical Usage Information

For Makeup Chemical Usage within your facility, Subpart AA requires you to report the following data:

- A unique name or identifier, plus optional description for this unit. See also [About Unique Unit Names](#)

Subpart AA Process Unit Information

For each process unit at your facility, the following unit information is required:

- A unique name or identifier, plus optional description for this unit. See also [About Unique Unit Names](#).
- The type of unit, selected from the following:
 - Pulp mill lime kiln
 - Chemical recovery furnace
 - Chemical recovery combustion unit
- An indication of whether the unit is monitored by Continuous Emissions Monitoring System (CEMS)

Subpart AA Emissions Information

The required emissions information and the manner by which required emissions information is entered into e-GGRT is different for makeup chemical usage, process units that are monitored by a CEMS, and process units that are NOT monitored by a CEMS.

As a result, separate help content has been created in this subpart for entering emissions information for makeup chemical usage, process units monitored by CEMS and process units NOT monitored by CEMS.

For **makeup chemical usage**, the following emissions information is required:

- The annual CO₂ process emissions
- An indication of whether a substitute value was used for CaCO₃
- An indication of whether a substitute value was used for NaCO₃

For each **chemical recovery furnace** that is NOT monitored by CEMS at your facility, the following emissions information is required:

- The annual biogenic CO₂, CH₄ and N₂O process emissions
- The basis for annual mass of spent liquor solids, selected from the following:
 - TAPPI method
 - On-line metering/measuring system
- An indication of whether a substitute value was used for annual mass of spent liquor solids
- The total annual CO₂ mass emissions from fossil fuel
- The total annual CH₄ mass emissions from fossil fuel
- The total annual N₂O mass emissions from fossil fuel
- Calculation methodology start date and end date, for each fuel type
- Calculation methodology used for the emissions calculation period specified, for each fuel type:
 - Tier 1/Equation C-1: Annual fuel combusted, default heating value, and default CO₂ emission factor
 - Tier 1/Equation C-1a: Annual natural gas usage from billing records (therms) and default CO₂ emission factor
 - Tier 1/Equation C-1b: Annual natural gas usage from billing records (mmBtu) and default CO₂ emission factor
 - Tier 2/Equation C-2a: Annual fuel combusted, measured heating value, and default CO₂ emission factor
 - Tier 2/Equation C-2c: Steam generation, ratio of maximum rated heat input capacity to design rated steam output capacity, and default CO₂ emission factor (for MSW and solid fuels listed in Table C-1))
 - Tier 3/Equation C-3: Annual mass of solid fuel combusted and average carbon content of the solid fuel
 - Tier 3/Equation C-4: Annual mass of liquid fuel combusted and average carbon content of the liquid fuel
 - Tier 3/Equation C-5: Annual volume of gaseous fuel combusted, average carbon content of the gaseous fuel, and average molecular weight of the gaseous fuel

For each **chemical recovery combustion unit** that is NOT monitored by CEMS at your facility, the following emissions information is required:

- The annual biogenic CO₂, CH₄ and N₂O process emissions
- The basis for annual mass of spent liquor solids, selected from the following:
 - TAPPI method
 - On-line metering/measuring system
- An indication of whether a substitute value was used for annual mass of spent liquor solids
- The total annual CO₂ mass emissions from fossil fuel
- The total annual CH₄ mass emissions from fossil fuel
- The total annual N₂O mass emissions from fossil fuel
- Calculation methodology start date and end date, for each fuel type
- Calculation methodology used for the emissions calculation period specified, for each fuel type:
 - Tier 1/Equation C-1: Annual fuel combusted, default heating value, and default CO₂ emission factor
 - Tier 1/Equation C-1a: Annual natural gas usage from billing records (therms) and default CO₂ emission factor
 - Tier 1/Equation C-1b: Annual natural gas usage from billing records (mmBtu) and default CO₂ emission factor
 - Tier 2/Equation C-2a: Annual fuel combusted, measured heating value, and default CO₂ emission factor
 - Tier 2/Equation C-2c: Steam generation, ratio of maximum rated heat input capacity to design rated steam output capacity, and default CO₂ emission factor (for MSW and solid fuels listed in Table C-1))
 - Tier 3/Equation C-3: Annual mass of solid fuel combusted and average carbon content of the solid fuel
 - Tier 3/Equation C-4: Annual mass of liquid fuel combusted and average carbon content of the liquid fuel
 - Tier 3/Equation C-5: Annual volume of gaseous fuel combusted, average carbon content of the gaseous fuel, and average molecular weight of the gaseous fuel

For each **pulp mill lime kiln** that is NOT monitored by CEMS at your facility, the following emissions information is required:

- The total annual CO₂ mass emissions
- The total annual CH₄ mass emissions
- The total annual N₂O mass emissions
- Calculation methodology start date and end date, for each fuel type
- Calculation methodology used for the emissions calculation period specified, for each fuel type:
 - Tier 1/Equation C-1: Annual fuel combusted, default heating value, and default CO₂ emission factor
 - Tier 1/Equation C-1a: Annual natural gas usage from billing records (therms) and default CO₂ emission factor
 - Tier 1/Equation C-1b: Annual natural gas usage from billing records (mmBtu) and default CO₂ emission factor
 - Tier 2/Equation C-2a: Annual fuel combusted, measured heating value, and default CO₂ emission factor
 - Tier 2/Equation C-2c: Steam generation, ratio of maximum rated heat input capacity to design rated steam output capacity, and default CO₂ emission factor (for MSW and solid fuels listed in Table C-1))
 - Tier 3/Equation C-3: Annual mass of solid fuel combusted and average carbon content of the solid fuel
 - Tier 3/Equation C-4: Annual mass of liquid fuel combusted and average carbon content of the liquid fuel
 - Tier 3/Equation C-5: Annual volume of gaseous fuel combusted, average carbon content of the gaseous fuel, and average molecular weight of the gaseous fuel

For each CEMS Monitoring Location, provide the following information:

- A unique unit name or identifier for the CML (see also [About Unique Unit Names](#))
- An optional description or label for the CML
- The configuration of processes or process units that are monitored by the CML:
 - Single industrial process or process unit that exhausts to a dedicated stack
 - Multiple industrial processes or process units share a common stack
 - Industrial process or process unit shares a common stack with one or more stationary fuel combustion units
- The name of each fuel combusted in the unit(s) monitored by the CEMS
- The Tier 4/CEMS methodology start and end dates
- The cumulative total of hourly CO₂ mass emissions for each quarter of the reporting year (in metric tons) (*Do not cumulate emissions data between quarters*)
- The total annual CO₂ mass emissions measured by the CEMS (in metric tons)
- An indication whether emissions reported for the CEMS include emissions calculated according to 98.33(a)(4)(viii) for a slipstream that bypassed the CEMS
- The total annual biogenic CO₂ emissions from the combustion of all biomass fuels combined (in metric tons) (*if applicable*)
- The total annual non-biogenic CO₂ emissions (includes fossil fuel, sorbent, and process CO₂ emissions, in metric tons)
- The total annual CH₄ and N₂O emissions associated with the combustion of all [Table C-2](#) fuels combusted in all processes/process units monitored by the CEMS derived from application of [Equation C-10](#) (in metric tons) (*if there are no combustion emissions in this CML, please enter zero*)
- The total number of source operating hours in the reporting year
- The total operating hours in which a substitute data value was used in the emissions calculations for the CO₂ concentration parameter
- The total operating hours in which a substitute data value was used in the emissions calculations for the stack gas flow rate parameter
- If moisture correction is required and a continuous moisture monitor is used, the total operating hours in which a substitute data value was used in the emissions calculations for the stack gas moisture content parameter
- An indication of the process units monitored by the CML

Subpart AA Validation Report

The Validation Report assists with the completeness and quality of your reporting data.

We strongly encourage you to use the Validation Report to check your work. The Validation Report performs two types of checks:

- Data Completeness: Data required for reporting that are missing or incomplete.
- Data Quality: Data that are outside of the expected range of values.

You may view the Validation Report at any time.



Note that the Validation Report is intended to assist users in entering data, but it is not an indication that the reporter has entered all necessary information, nor is it an indication that the reporter is in compliance with part 98. Furthermore a negative finding on the validation report is not a guarantee that a data element was entered incorrectly.

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See Also

[Screen Errors](#)
[Using e-GGRT to Prepare Your Subpart AA Report](#)
[Subpart AA Summary Information for this Facility](#)
[Subpart AA Makeup Chemical Usage Information](#)

[Subpart AA Process Unit Information for Units NOT Monitored by CEMS](#)
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[Subpart Validation Report](#)

Subpart AA Summary Information for this Facility

This topic provides a step-by-step description of how to enter Subpart AA summary information about this facility

Adding or Updating Summary Information for this Facility

To add or update Subpart AA Summary Information for this Facility, locate the SUMMARY INFORMATION FOR THIS FACILITY table on the Subpart AA Overview page, and click OPEN.

Click image to expand

The screenshot shows the EPA e-GGRT interface for facility ABC Petroleum. The main heading is "Subpart AA: Pulp and Paper Manufacturing (2011)". Below this is an "OVERVIEW OF SUBPART AA REPORTING REQUIREMENTS" section, followed by a table titled "SUBPART AA SUMMARY INFORMATION FOR THIS FACILITY".

Annual Steam Purchases (pounds)	Annual Production of Pulp Products (metric tons)	Annual Production of Paper Products (metric tons)

Below the table are sections for "MAKEUP CHEMICAL USAGE SUMMARY" and "UNIT AND FURNACE SUMMARY", each with a table for adding units. The "UNIT AND FURNACE SUMMARY" table has columns for Name ID, Type, CO₂ (metric tons), Biogenic CO₂ (metric tons), Status, and Delete.

Subpart AA requires you to report the following data about your facility:

- The annual steam purchases (pounds)
- The annual production of pulp products (metric tons)
- The annual production of paper products (metric tons)

When you have entered the required information, click SAVE.

Click image to expand

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See Also

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[Using e-GGRT to Prepare Your Subpart AA Report](#)

[Subpart AA Summary Information for this Facility](#)

[Subpart AA Makeup Chemical Usage Information](#)

[Subpart AA Process Unit Information for Units NOT Monitored by CEMS](#)

[Subpart AA Process Unit Information for Units Monitored by CEMS](#)

[Subpart AA Emissions Information for Makeup Chemical Recovery](#)

[Subpart AA Emissions Information for Units NOT Monitored by CEMS](#)

[Subpart AA Emissions Information for Units Monitored by CEMS](#)

[Subpart Validation Report](#)

Subpart AA Makeup Chemical Usage Information

The text below describes how to add a Makeup Chemical Usage. The process to edit an existing Makeup Chemical Usage is essentially similar.

Step 1: Adding or Updating Makeup Chemical Usage Information for this Facility

Starting on the Subpart AA Overview page, click the link titled "ADD Makeup Chemical Use".

To edit an existing Makeup Chemical Usage, click on the edit icon or the Name/ID link, which is the first column in the MAKEUP CHEMICAL USAGE SUMMARY table.

To delete an existing Makeup Chemical Usage, click on the delete icon, which is the last column in the MAKEUP CHEMICAL USAGE SUMMARY table.

Click image to expand

Step 2: Enter Required Information

For Makeup Chemical Usage within your facility, Subpart AA requires you to report the following data:

- A unique name or identifier, plus optional description for this unit. See also About Unique Unit Names

When you are finished, click SAVE.

Click image to expand

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See Also

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Using e-GGRT to Prepare Your Subpart AA Report

Subpart AA Summary Information for this Facility

Subpart AA Makeup Chemical Usage Information

Subpart AA Process Unit Information for Units NOT Monitored by CEMS

Subpart AA Process Unit Information for Units Monitored by CEMS

Subpart AA Emissions Information for Makeup Chemical Recovery

Subpart AA Emissions Information for Units NOT Monitored CEMS

Subpart AA Emissions Information for Units Monitored by CEMS

Subpart Validation Report

Subpart AA Process Unit Information for Units NOT Monitored by CEMS

The text below describes how to add a Unit or Furnace. The process to edit an existing Unit or Furnace is essentially similar.

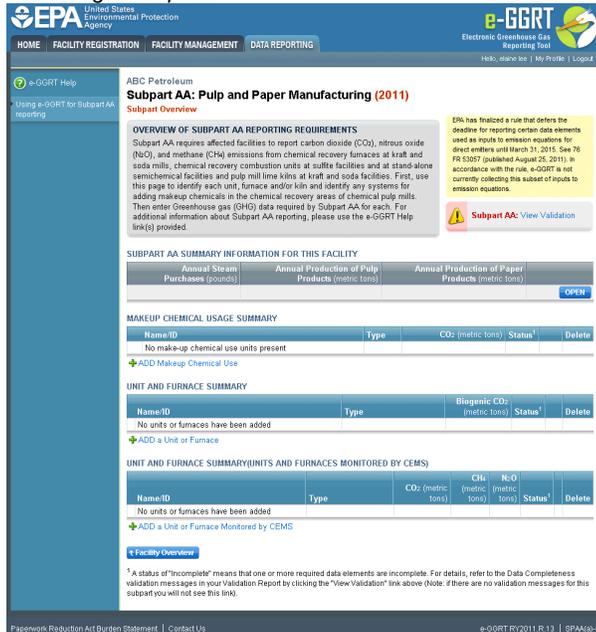
Step 1: Adding, Modifying or Deleting Process Unit Information for Units NOT Monitored by CEMS at this Facility

Starting on the Subpart AA Overview page, click the link titled "ADD a Unit or Furnace".

To modify an existing unit or furnace, click on the edit icon or the Name/ID link, which is the first column in the UNIT AND FURNACE SUMMARY table.

To delete an existing unit or furnace, click on the delete icon, which is the last column in the UNIT AND FURNACE SUMMARY table.

Click image to expand



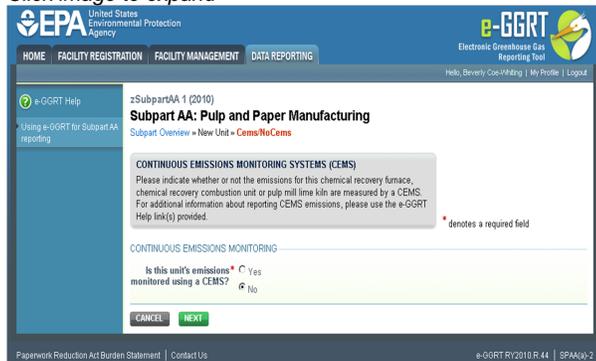
Step 2: Indicate CEMS Utilization for a Unit

For each unit or furnace indicate that the emissions are not measured by operating and maintaining a Continuous Emissions Monitoring System (CEMS). Click either yes or No.

Note that when adding a new unit you are prompted to answer the CEMS question immediately (the answer to this question will default to "No" for units added using the "ADD a Unit" link and will default to "Yes" for units added using the "ADD a Unit Monitored by CEMS" link)

When you are finished, click NEXT.

Click image to expand



Step 3: Enter Required Information for a Unit

For each unit or furnace within your facility, Subpart AA requires you to report the following data:

- A unique name or identifier, plus optional description for this unit (see also About Unique Unit Names)
- The type of unit, selected from the following:
 - Pulp mill lime kiln
 - Chemical recovery furnace
 - Chemical recovery combustion unit
- An indication of whether the unit is monitored by CEMS

When you are finished, click SAVE.

Click image to expand

The screenshot shows the EPA e-GGRT interface for Subpart AA: Pulp and Paper Manufacturing. The page title is "zSubpartAA 1 (2010) Subpart AA: Pulp and Paper Manufacturing". Below the title, there is a section titled "FURNACE, UNIT, KILN OR MAKEUP CHEMICAL SYSTEM INFORMATION" with a sub-header "Subpart AA requires a facility or supplier to uniquely identify each chemical recovery furnace, chemical recovery combustion unit, pulp mill lime kiln, and makeup chemical system and provide the information described below for each. For additional information about adding and editing a furnace, unit, kiln or makeup chemical system, please use the e-GGRT Help link(s) provided." Below this is a form with the following fields: "Name or ID" (with a value of "Caust1" and a note "(40 characters maximum)"), "Description (optional)" (with a value of "Make up Chemical Use"), and "Type" (with a value of "Make-up Chemical Use"). There are "CANCEL" and "SAVE" buttons at the bottom of the form. The footer of the page includes "Paperwork Reduction Act Burden Statement | Contact Us" and "e-GGRT RY2010 R.44 | SPAAa-3".

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[Subpart AA Makeup Chemical Usage Information](#)

[Subpart AA Process Unit Information for Units NOT Monitored by CEMS](#)

[Subpart AA Process Unit Information for Units Monitored by CEMS](#)

[Subpart AA Emissions Information for Makeup Chemical Recovery](#)

[Subpart AA Emissions Information for Units NOT Monitored CEMS](#)

[Subpart AA Emissions Information for Units Monitored by CEMS](#)

[Subpart Validation Report](#)

Subpart AA Process Unit Information for Units Monitored by CEMS

This page provides step-by-step instructions on how to enter and edit Subpart AA Pulp and Paper Manufacturing process unit information for units that are monitored by a Continuous Emissions Monitoring System (CEMS).

Step 1: Add, modify or delete a unit

To add a unit that is monitored by a CEMS, find the UNIT AND FURNACE SUMMARY (UNITS AND FURNACES MONITORED BY CEMS) table on the Subpart Overview page and click the link titled "ADD a Unit Monitored by CEMS"

To modify a unit, click the edit icon or the Name/ID link located in the first column of the UNIT AND FURNACE SUMMARY (UNITS AND FURNACES MONITORED BY CEMS) table

To delete a unit, click the delete icon located in the last column of the UNIT AND FURNACE SUMMARY (UNITS AND FURNACES MONITORED BY CEMS) table

Click image to expand

Step 2: Indicate CEMS utilization for a unit

For each process unit, confirm whether or not the process unit utilizes CEMS

Note that when adding a new unit you are prompted to answer the CEMS question immediately (the answer to this question will default to “No” for units added using the “ADD a Unit” link and will default to “Yes” for units added using the “ADD a Unit Monitored by CEMS” link)

The CEMS response may be changed here and the unit information will be relocated to the appropriate table on the Subpart Overview page

When finished, click SAVE

Click image to expand

Step 3: Enter required information for a unit

For each process unit monitored by a CEMS, report the following required information:

- A unique name or identifier for the unit, plus optional description for this facility (see also About Unique Unit Names)
- The unit type, selected from the following:
 - Chemical Recovery Furnace
 - Chemical Recovery Combustion Unit
 - Pulp Mill Lime Kiln
- Indicate whether the unit is monitored by a CEMS

When finished, click SAVE

Click image to expand

United States Environmental Protection Agency

e-GGRT Electronic Greenhouse Gas Reporting Tool

HOME FACILITY REGISTRATION FACILITY MANAGEMENT DATA REPORTING

zSubpartAA 1 (2010)

Subpart AA: Pulp and Paper Manufacturing

Subpart Overview » Ccaust1 » Group unit

FURNACE, UNIT, KILN OR MAKEUP CHEMICAL SYSTEM INFORMATION

Subpart AA requires a facility or supplier to uniquely identify each chemical recovery furnace, chemical recovery combustion unit, pulp mill lime kiln, and makeup chemical system and provide the information described below for each. For additional information about adding and editing a furnace, unit, kiln or makeup chemical system, please use the e-GGRT Help link(s) provided. * denotes a required field

UNIT INFORMATION

Name or ID*	Description (optional)	Type
Ccaust1 (40 characters maximum)	Make up Chemical Use	Make-up Chemical Use

CANCEL SAVE

Paperwork Reduction Act Burden Statement | Contact Us e-GGRT RY2010 R.44 | SP44a-3

Step 4: Repeat Steps 1-3

Repeat Steps 1-3 until all process units monitored by a CEMS have been added for your facility

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[Subpart AA Emissions Information for Units Monitored by CEMS](#)

[Subpart Validation Report](#)

Subpart AA Emissions Information for Makeup Chemical Recovery

This page provides a step-by-step description of how to enter Subpart AA emissions data for makeup chemical recovery.

Adding or Updating Emissions for unit type Make-up Chemical Use

To add or update Subpart AA emissions for unit type **Make-up Chemical Use**, locate the MAKEUP CHEMICAL USAGE SUMMARY table on the Subpart AA Overview page, and click OPEN.

Click image to expand

Step 1: Equation AA-3 Summary and Result

The annual CO₂ process emissions for this unit are required. To calculate these values download the spreadsheet by clicking the link titled “Use AA-3spreadsheet to calculate”. Fill in the spreadsheet using the instructions in the spreadsheet. After completing the spreadsheet, copy the value of CO₂, calculated by the spreadsheet to this page in the box next to “CO₂ mass emissions from makeup chemicals”.

The Equation AA-3 Summary is presented on the page. You can hover over an element in the equation to reveal a definition of that element.

Step 2: Basis and Substitute value

For each makeup unit or furnace within your facility, Subpart AA requires you to report the following data:

- Indicate a substitute value for CaCO₃
- Indicate a substitute value for NaCO₃

Step 3: Save Your Data

When you have finished entering emission results and substitute data, click SAVE.

After you save the data on this page, the next time you open the page, the calculator on the top of the page will display the CO₂ process emissions, rounded to the nearest 0.1 of a metric ton. The value displayed is for informational purposes only.

When CO₂ emissions has been entered the Status column on the Makeup Chemical Usage Summary will show “Complete” and the background color for that furnace will show as green.

Click image to expand

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[Subpart Validation Report](#)

Subpart AA Emissions Information for Units NOT Monitored CEMS

This page provides a step-by-step description of how to enter Subpart AA emissions data.

Note: Emissions information for Subpart AA depends upon the type of unit.

- Chemical Recovery Furnace requires you to report emissions using Equation AA-1
- Chemical Recovery Combustion Unit requires you to report emissions using Equation AA-1 and AA-2
- Pulp Mill Lime Kiln requires you to report emissions using Equations from Subpart C

Adding or Updating Emissions Information for a Chemical Recovery Furnace or Combustion Unit

To add or update Subpart AA emissions information for a **Chemical Recovery Furnace** or **Chemical Recovery Combustion Unit**, find the unit or furnace for which you would like to enter emissions information in the UNIT AND FURNACE SUMMARY table on the Subpart AA Overview page, and click OPEN.

[Click image to expand](#)

ABC Petroleum
Subpart AA: Pulp and Paper Manufacturing (2011)
[Subpart Overview](#)

OVERVIEW OF SUBPART AA REPORTING REQUIREMENTS
Subpart AA requires affected facilities to report carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄) emissions from chemical recovery furnaces at kraft and soda mills, chemical recovery combustion units at sulfate facilities and at stand-alone semichemical facilities and pulp mill lime kilns at kraft and soda facilities. First, use this page to identify each unit, furnace and/or kiln and identify any systems for adding makeup chemicals in the chemical recovery areas of chemical pulp mills. Then enter Greenhouse gas (GHG) data required by Subpart AA for each. For additional information about Subpart AA reporting, please use the e-GGRT Help link(s) provided.

ERL has finalized a rule that defers the deadline for reporting certain data elements used as inputs to emission equations for direct entities until March 31, 2015. See 76 FR 52057 (published August 25, 2011), in accordance with the rule, e-GGRT is not currently collecting this subset of inputs to emission equations.

Subpart AA: View Validation

SUBPART AA SUMMARY INFORMATION FOR THIS FACILITY

Annual Steam Purchases (pounds)	Annual Production of Pulp Products (metric tons)	Annual Production of Paper Products (metric tons)

MAKEUP CHEMICAL USAGE SUMMARY

Name/ID	Type	CO ₂ (metric tons)	Status ¹	Delete
No make-up chemical use units present				

UNIT AND FURNACE SUMMARY

Name/ID	Type	Biogenic CO ₂ (metric tons)	Status ¹	Delete
No units or furnaces have been added				

UNIT AND FURNACE SUMMARY/UNITS AND FURNACES MONITORED BY CEMS

Name/ID	Type	CO ₂ (metric tons)	CH ₄ (metric tons)	N ₂ O (metric tons)	Status ¹	Delete
No units or furnaces have been added						

¹ A status of "Incomplete" means that one or more required data elements are incomplete. For details, refer to the Data Completeness validation messages in your Validation Report by clicking the "View Validation" link above. (Note: if there are no validation messages for this subpart you will not see this link.)

Step 1: Equations AA-1 / AA-2 Summary and Result

For each **chemical recovery furnace**, Subpart AA requires the following emissions information:

- The annual biogenic CO₂, CH₄ and N₂O process emissions

To calculate these values download the applicable spreadsheet by clicking the link titled "Use Subpart AA-1 equation spreadsheet to calculate". Fill in the spreadsheet using the instructions in the spreadsheet. After completing the spreadsheet, copy the values of CO₂, CH₄ and N₂O calculated by the spreadsheet to this page in the boxes next to "Result (CO₂ from biomass)", "Result (CH₄ from biomass)" and "Result (N₂O from

biomass)".

The Equation AA-1 Summary is presented on this page. You can hover over an element in the equation to reveal a definition of that element.

For each **chemical recovery combustion unit**, Subpart AA requires the following emissions information:

- The annual biogenic CO₂, CH₄ and N₂O process emissions

To calculate these values download the spreadsheets by clicking the links titled "Use AA-1 spreadsheet to calculate" and "Use AA-2 spreadsheet to calculate". Fill in the spreadsheets using the instructions in the spreadsheets. After completing the spreadsheets, copy the values of CO₂, CH₄ and N₂O calculated by the spreadsheets to this page in the boxes next to "Result (Biogenic CO₂)", "Result (CH₄ from biomass)" and "Result (N₂O from biomass)".

The Equation AA-1 / AA-2 Summary is presented on this page. You can hover over an element in the equation to reveal a definition of that element.

Step 2: Basis and Substitute value

For each unit or furnace within your facility, Subpart AA requires you to report the following data:

- The basis for annual mass. Select from:
 - TAPPI method
 - On-line metering/measuring system
- Indicate if a substitute value was used.



Note: Steps 3-4 of this section do not apply for spent pulping liquor (the primary fuel for chemical recovery combustion units and recovery furnaces) or other biogenic fuel types. If spent pulping liquor and/or other biogenic fuels are the only fuel combusted by this unit or furnace, skip to Step 5.

Step 3: Identify Fuels Combusted by this Unit (if applicable)

To add a fuel combusted by this unit, click the link titled "ADD a Fuel" below the FUEL EMISSIONS INFORMATION table.

To edit a fuel, click on the edit icon or the Name/ID link, which is the first column in the FUEL EMISSIONS INFORMATION table.

To delete a fuel, click on the delete icon, which is the last column in the FUEL EMISSIONS INFORMATION table.

Click image to expand

The screenshot shows the EPA e-GGRT (Electronic Greenhouse Gas Reporting Tool) interface. The user is logged in as 'ABC Petroleum' and is viewing the 'Subpart AA: Pulp and Paper Manufacturing (2011)' reporting page. The page is divided into several sections:

- GHG DATA AND ASSOCIATED INFORMATION:** This section contains three input fields for 'Annual Biogenic CO₂ (metric tons)', 'Annual CH₄ from biomass (metric tons)', and 'Annual N₂O from biomass (metric tons)'. A note below these fields states: 'Do not include CH₄ or N₂O emissions reported on this page in the CEMS Monitoring Location (CML) emissions data.'
- EQUATION AA-1 SUMMARY AND RESULT:** This section displays the equation: $CO_2, CH_4, \text{ or } N_2O \text{ from biomass} = @ 50718) * Solids * HHV * EF$. Below the equation, there are three input fields for 'Result (CO₂ from biomass)', 'Result (CH₄ from biomass)', and 'Result (N₂O from biomass)', each with a 'Use Subpart AA-1 equation spreadsheets to calculate' link.
- ANNUAL MASS OF SPENT LIQUOR SOLIDS:** This section includes a dropdown menu for 'Basis for determining the annual mass of spent liquor solids' and a checkbox for 'Annual mass of spent liquor solids, substitute value used'.

At the bottom of the page, there are buttons for 'Subpart AA Overview', 'CANCEL', and 'SAVE'. The footer contains the text 'Paperwork Reduction Act Burden Statement | Contact Us' and 'e-GGRT P/2011.R.13 | SPAN/3-4'.

Click image to expand

On the Add Fuel screen, select a fuel combusted by this unit.

When finished, click SAVE

Click image to expand

For each fuel combusted by the unit, Subpart AA requires the following fuel information

- Calculation methodology start date and end date, for each fuel type
- Calculation methodology used for the emissions calculation period specified, for each fuel type:
 - Tier 1/Equation C-1: Annual fuel combusted, default heating value, and default CO₂ emission factor
 - Tier 1/Equation C-1a: Annual natural gas usage from billing records (therms) and default CO₂ emission factor
 - Tier 1/Equation C-1b: Annual natural gas usage from billing records (mmBtu) and default CO₂ emission factor
 - Tier 2/Equation C-2a: Annual fuel combusted, measured heating value, and default CO₂ emission factor
 - Tier 2/Equation C-2c: Steam generation, ratio of maximum rated heat input capacity to design rated steam output capacity, and default CO₂ emission factor (for MSW and solid fuels listed in Table C-1))
 - Tier 3/Equation C-3: Annual mass of solid fuel combusted and average carbon content of the solid fuel
 - Tier 3/Equation C-4: Annual mass of liquid fuel combusted and average carbon content of the liquid fuel
 - Tier 3/Equation C-5: Annual volume of gaseous fuel combusted, average carbon content of the gaseous fuel, and average molecular weight of the gaseous fuel

When you have entered the required information, click SAVE

Repeat this step until all fuels combusted by this unit have been added and identified.

Click image to expand

The screenshot shows the EPA e-GGRT web application interface. At the top, there are navigation tabs: HOME, FACILITY REGISTRATION, FACILITY MANAGEMENT, and DATA REPORTING. The user is logged in as Beverly Coe-Vinberg. The main content area is titled "Subpart AA: Pulp and Paper Manufacturing" and "DEFINE A CALCULATION PERIOD AND METHODOLOGY". It includes instructions on how to use the page to define calculation periods and methodologies. The form contains several sections: CONFIGURATION (Unit or Group Name: RF3in_range), EMISSIONS CALCULATION PERIOD (Fuel Type: Natural Gas (Weighted U.S. Average) (Natural Gas)), and CALCULATION METHODOLOGY (Tier 1 selected). There are "CANCEL" and "SAVE" buttons at the bottom.

Step 4: Enter Required Emissions Information for Each Fuel (if applicable)

To select a fuel combusted by this unit for which to enter emissions information, find the fuel in the FUEL EMISSIONS INFORMATION table and click OPEN.

For each fuel type (including biomass fuel(s)) for which you have elected to use a **Tier 1 (Equation C-1, C-1a, or C-1b)** methodology, you are required to report the following information by fuel type:

- The total annual CO₂ mass emissions derived from Equation C-1, Equation C-1a, or Equation C-1b in metric tons CO₂ [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]
- The total annual CH₄ mass emissions derived from Equation C-8, Equation C-8a, or Equation C-8b in metric tons CH₄ and in metric tons CO₂e (for Table C-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]
- The total annual N₂O mass emissions derived from Equation C-8, Equation C-8a, or Equation C-8b in metric tons N₂O and in metric tons CO₂e (for Table C-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]

For each fuel type (including biomass fuel(s)) for which you have elected to use the **Tier 2 (Equation C-2a)** methodology, you are required to report the following information by fuel type:

- The total annual CO₂ mass emissions derived from Equation C-2a in metric tons CO₂ [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]
- The total annual CH₄ mass emissions derived from Equation C-9a in metric tons CH₄ and in metric tons CO₂e (for Table C-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]
- The total annual N₂O mass emissions derived from Equation C-9a in metric tons N₂O and in metric tons CO₂e (for Table C-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]
- Identification of each month for which HHVs were calculated using one or more substitute data values [98.36(e)(2)(ii)(C)]
- The frequency of the HHV determinations [98.36(e)(2)(ii)(B)]
 - Hourly
 - Daily
 - Weekly
 - Monthly
 - Semiannually
 - Quarterly
 - Once per fuel lot
 - Upon addition of oil to the storage tank
 - Other (specify)

For each fuel type (including biomass fuel(s)) for which you have elected to use the **Tier 2 (Equation C-2c)** methodology, you are required to report the following information by fuel type:

- The total annual CO₂ mass emissions derived from Equation C-2c in metric tons CO₂ [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]
- The total annual CH₄ mass emissions derived from Equation C-9b in metric tons CH₄ and in metric tons CO₂e (for Table C-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]
- The total annual N₂O mass emissions derived from Equation C-9b in metric tons N₂O and in metric tons CO₂e (for Table C-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]

For each fuel type (including biomass fuel(s)) for which you have elected to use a **Tier 3 (Equation C-3, C-4, or C-5)** methodology, you are required to report the following information by fuel type:

- The total annual CO₂ mass emissions derived from Equation C-3 for solid fuels, Equation C-4 for liquid fuels, or Equation C-5 for gaseous fuels in metric tons CO₂ [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]
- The total annual CH₄ mass emissions derived from Equation C-8 in metric tons CH₄ and in metric tons CO₂e (for Table C-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]
- The total annual N₂O mass emissions derived from Equation C-8 in metric tons N₂O and in metric tons CO₂e (for Table C-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]
- The total number of valid carbon content determinations [98.36(e)(2)(iv)(D)]
- The total number of carbon content substitute data values [98.36(e)(2)(iv)(E)]
- The frequency of carbon content determinations [98.36(e)(2)(iv)(B)]
 - Hourly
 - Daily
 - Weekly
 - Monthly
 - Semiannually
 - Quarterly
 - Once per fuel lot
 - Upon addition of oil to the storage tank
 - Other (specify)
- The total number of operating hours in the reporting year for which missing data substitution was used for fuel usage [98.3(c)(8)]

For each gaseous fuel at each configuration for which you have elected to use the **Tier 3 (Equation C-5)** methodology, you are also required to report the following additional information:

- Total number of valid molecular weight determinations [98.36(e)(2)(iv)(D)]
- Total number of molecular weight substitute data values [98.36(e)(2)(iv)(E)]
- Frequency of molecular weight determinations [98.36(e)(2)(iv)(B)]
 - Hourly
 - Daily
 - Weekly
 - Monthly
 - Semiannually
 - Quarterly
 - Other (specify)

Use the red-bordered text boxes to enter the required emissions information.

To calculate the emissions you have the option of using your own resources or alternatively you may use the following tool and set of instructions:

- Download the spreadsheet tool by clicking the link below one of the red-bordered text boxes labeled "Use Tier X spreadsheet to calculate"
- Fill in the spreadsheet completely using the instructions provided in the tool
- After completing the spreadsheet, copy the values calculated by the spreadsheet to the red-bordered text boxes on this page

When you have finished entering emission results for the unit, click **SAVE**.

Repeat this step until emissions information has been entered for each fuel combusted by the unit.

Click image to expand

FUEL SPECIFIC EMISSIONS

Use this page to enter the annual GHG emissions information for this fuel. For additional information about the data collected on this page, please use the e-GGRT Help link(s) provided.

Annual CO₂ (metric tons): 5,730
 Annual CH₄ (metric tons): 0.11
 Annual N₂O (metric tons): 0.01

CONFIGURATION-FUEL PERIOD

Unit or Group Name/ID: RF3in_range
 Fuel (Fuel Type): Natural Gas (Weighted U.S. Average) (Natural Gas)
 Reporting Period: 01/01/2010 - 12/31/2010

EQUATION C-1 SUMMARY AND RESULT

$$CO_2 = 1 \times 10^3 \times \text{Fuel} \times \text{HRV} \times \text{EF}$$

Annual CO₂ emissions from combustion of the specified fuel: 5730 (metric tons)

EQUATION C-8 SUMMARY AND RESULTS

$$CH_4 \text{ or } N_2O = 1 \times 10^3 \times \text{Fuel} \times \text{HRV} \times \text{EF}$$

Annual CH₄ emissions from combustion of the specified fuel: 0.11 (metric tons)
 Annual N₂O emissions from combustion of the specified fuel: 0.011 (metric tons)

CO₂ EQUIVALENT EMISSIONS

CO₂ equivalent value for Annual CH₄ emissions: 2.3 (metric tons)
 CO₂ equivalent value for Annual N₂O emissions: 3.3 (metric tons)

Buttons: CANCEL, SAVE

Step 5: Save Your Data

When you have finished entering emission results and substitute data, click **SAVE**.

After you save the data on this page, the next time you open the page, the calculator on the top of the page will display the CO₂, CH₄, and N₂O process emissions, rounded to the nearest 0.1, 0.01, and 0.001 of a metric ton, respectively. The value displayed is for informational purposes only.

When CO₂, CH₄ and N₂O process emissions have been entered the Status column on the Unit and Furnace Summary will show "Complete" and the background color for that furnace will show as green.

Click image to expand

GHG DATA AND ASSOCIATED INFORMATION

Use this page to enter the GHG data required by Subpart AA. Please enter the information shown for this chemical recovery furnace. For additional information about the data collected on this page, please use the e-GGRT Help link(s) provided.

Annual Biogenic CO₂ (metric tons): 5,730
 Annual CH₄ from biomass (metric tons): 0.11
 Annual N₂O from biomass (metric tons): 0.01

EQUATION AA-1 SUMMARY AND RESULT

$$CO_2, CH_4, \text{ or } N_2O \text{ from biomass} = (0.90718) \times \text{Solids} \times \text{HRV} \times \text{EF}$$

Result (CO₂ from biomass): 5730 (metric tons)
 Result (CH₄ from biomass): 0.11 (metric tons)
 Result (N₂O from biomass): 0.011 (metric tons)

ANNUAL MASS OF SPENT LIQUOR SOLIDS

Basis for determining the annual mass of spent liquor solids: TAPP method
 Annual mass of spent liquor solids, substitute value used: (check if true)

Note: The following Fuel Emissions Information (fuels combusted by this reporting unit) section does not apply for spent pulping liquor (the primary fuel for chemical recovery combustion units and recovery furnaces).

FUEL EMISSIONS INFORMATION (fuels combusted by this reporting unit)

Fuel	Calculation Period	Methodology	Status	Delete
Natural Gas (Weighted U.S. Average)	01/01/2010 - 12/31/2010	Tier 1 (Equation C-1)	Complete	OPEN

Buttons: ADD a Fuel, Subpart AA Overview, CANCEL, SAVE

¹ A status of "incomplete" means that one or more required data elements are incomplete. For details, refer to the Data Completeness validation messages in your Validation Report by clicking the "View Validation" link on the overview page. (Note: if there are no validation messages for this subpart you will not see this link.)

Click image to expand

Adding or Updating Emissions for unit type Pulp Mill Lime Kiln

To add or update Subpart AA emissions for unit type **Pulp Mill Lime Kiln**, find the kiln for which you would like to enter emissions information in the UNIT AND FURNACE SUMMARY table on the Subpart AA Overview page, and click OPEN.

Click image to expand

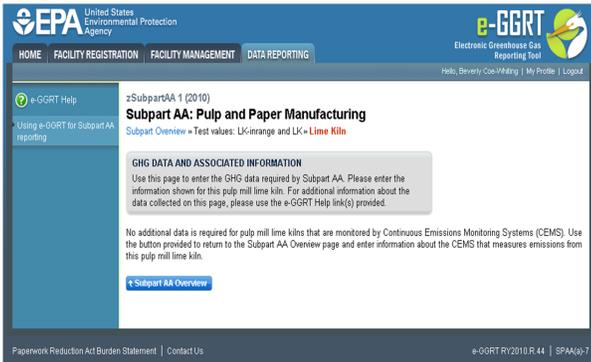
Step 1: Identify Fuels Combusted by this Unit

To add a fuel combusted by this unit, click the link titled "ADD a Fuel" below the FUEL EMISSIONS INFORMATION table.

To edit a fuel, click on the edit icon or the Name/ID link, which is the first column in the FUEL EMISSIONS INFORMATION table.

To delete a fuel, click on the delete icon, which is the last column in the FUEL EMISSIONS INFORMATION table.

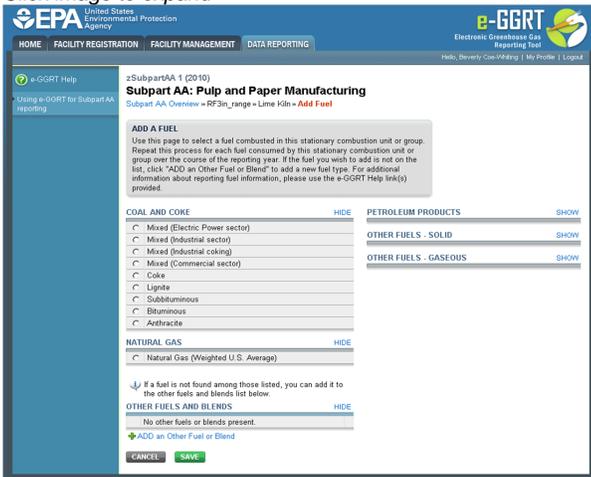
Click image to expand



On the Add Fuel screen, select a fuel combusted by this unit.

When finished, click SAVE

Click image to expand



For each fuel combusted by the unit, Subpart AA requires the following fuel information

- Calculation methodology start date and end date, for each fuel type
- Calculation methodology used for the emissions calculation period specified, for each fuel type:
 - Tier 1/Equation C-1: Annual fuel combusted, default heating value, and default CO₂ emission factor
 - Tier 1/Equation C-1a: Annual natural gas usage from billing records (therms) and default CO₂ emission factor
 - Tier 1/Equation C-1b: Annual natural gas usage from billing records (mmBtu) and default CO₂ emission factor
 - Tier 2/Equation C-2a: Annual fuel combusted, measured heating value, and default CO₂ emission factor
 - Tier 2/Equation C-2c: Steam generation, ratio of maximum rated heat input capacity to design rated steam output capacity, and default CO₂ emission factor (for MSW and solid fuels listed in Table C-1))
 - Tier 3/Equation C-3: Annual mass of solid fuel combusted and average carbon content of the solid fuel
 - Tier 3/Equation C-4: Annual mass of liquid fuel combusted and average carbon content of the liquid fuel
 - Tier 3/Equation C-5: Annual volume of gaseous fuel combusted, average carbon content of the gaseous fuel, and average molecular weight of the gaseous fuel

When you have entered the required information, click SAVE

Repeat this step until all fuels combusted by this unit have been added and identified.

Click image to expand

The screenshot shows the EPA e-GGRT web application interface. At the top, there are logos for the United States Environmental Protection Agency and e-GGRT (Electronic Greenhouse Gas Reporting Tool). The navigation menu includes HOME, FACILITY REGISTRATION, FACILITY MANAGEMENT, and DATA REPORTING. The user is logged in as Beverly Coe-Vinberg.

The main content area is titled "Subpart AA: Pulp and Paper Manufacturing" and "DEFINE A CALCULATION PERIOD AND METHODOLOGY". It provides instructions on how to use the page to define the calculation period and methodology for emissions reporting. The form includes several sections:

- CONFIGURATION:** Unit or Group Name: RF3in_range
- EMISSIONS CALCULATION PERIOD:** Fuel (Fuel Type): Natural Gas (Weighted U.S. Average) (Natural Gas). Calculation Methodology Start Date: 01/01/2010. Calculation Methodology End Date: 12/31/2010.
- CALCULATION METHODOLOGY:** Indicate your calculation methodology for this fuel, for the Emissions Calculation Period specified.
 - Tier 1 (equations C-1 and C-8) For use with natural gas, when billing records are used to quantify usage, and consumption is expressed in units of therms.
 - Tier 1 (equations C-1a and C-8a) For use with natural gas, when billing records are used to quantify usage, and consumption is expressed in units of therms.
 - Tier 1 (equations C-1b and C-8b) For use with natural gas, when billing records are used to quantify usage, and consumption is expressed in units of therms.
 - Tier 2 (equations C-2a and C-9a) For use with any type of fuel listed in Table C-1, except for municipal solid waste (MSW).
 - Tier 3 (equations C-5 and C-8) For use with gaseous fuels.

Buttons for CANCEL and SAVE are visible at the bottom of the form.

Step 2: Enter Required Emissions Information for Each Fuel

To select a fuel combusted by this unit for which to enter emissions information, find the fuel in the FUEL EMISSIONS INFORMATION table and click OPEN.

For each fuel type (not including biomass fuel(s)) for which you have elected to use a **Tier 1 (Equation C-1, C-1a, or C-1b)** methodology, you are required to report the following information by fuel type:

- The total annual CO₂ mass emissions derived from Equation C-1, Equation C-1a, or Equation C-1b in metric tons CO₂ [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]
- The total annual CH₄ mass emissions derived from Equation C-8, Equation C-8a, or Equation C-8b in metric tons CH₄ and in metric tons CO₂e (for Table AA-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii), 98.273(c)(2)]
- The total annual N₂O mass emissions derived from Equation C-8, Equation C-8a, or Equation C-8b in metric tons N₂O and in metric tons CO₂e (for Table AA-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii), 98.273(c)(2)]

For each fuel type (not including biomass fuel(s)) for which you have elected to use the **Tier 2 (Equation C-2a)** methodology, you are required to report the following information by fuel type:

- The total annual CO₂ mass emissions derived from Equation C-2a in metric tons CO₂ [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]
- The total annual CH₄ mass emissions derived from Equation C-9a in metric tons CH₄ and in metric tons CO₂e (for Table AA-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii), 98.273(c)(2)]
- The total annual N₂O mass emissions derived from Equation C-9a in metric tons N₂O and in metric tons CO₂e (for Table AA-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii), 98.273(c)(2)]
- Identification of each month for which HHVs were calculated using one or more substitute data values [98.36(e)(2)(ii)(C)]
- The frequency of the HHV determinations [98.36(e)(2)(ii)(B)]
 - Hourly
 - Daily
 - Weekly
 - Monthly
 - Semiannually
 - Quarterly
 - Once per fuel lot
 - Upon addition of oil to the storage tank
 - Other (specify)

For each fuel type (not including biomass fuel(s)) for which you have elected to use the **Tier 2 (Equation C-2c)** methodology, you are required to report the following information by fuel type:

- The total annual CO₂ mass emissions derived from Equation C-2c in metric tons CO₂ [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]
- The total annual CH₄ mass emissions derived from Equation C-9b in metric tons CH₄ and in metric tons CO₂e (for Table AA-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii), 98.273(c)(2)]
- The total annual N₂O mass emissions derived from Equation C-9b in metric tons N₂O and in metric tons CO₂e (for Table AA-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii), 98.273(c)(2)]

For each fuel type (not including biomass fuel(s)) for which you have elected to use a **Tier 3 (Equation C-3, C-4, or C-5)** methodology, you are required to report the following information by fuel type:

- The total annual CO₂ mass emissions derived from Equation C-3 for solid fuels, Equation C-4 for liquid fuels, or Equation C-5 for gaseous fuels in metric tons CO₂ [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii)]
- The total annual CH₄ mass emissions derived from Equation C-8 in metric tons CH₄ and in metric tons CO₂e (for Table AA-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii), 98.273(c)(2)]
- The total annual N₂O mass emissions derived from Equation C-8 in metric tons N₂O and in metric tons CO₂e (for Table AA-2 fuels only) [98.36(b)(8)(i), 98.36(c)(1)(vi), 98.36(c)(3)(vii), 98.273(c)(2)]
- The total number of valid carbon content determinations [98.36(e)(2)(iv)(D)]
- The total number of carbon content substitute data values [98.36(e)(2)(iv)(E)]
- The frequency of carbon content determinations [98.36(e)(2)(iv)(B)]
 - Hourly
 - Daily
 - Weekly
 - Monthly
 - Semiannually
 - Quarterly
 - Once per fuel lot
 - Upon addition of oil to the storage tank
 - Other (specify)
- The total number of operating hours in the reporting year for which missing data substitution was used for fuel usage [98.3(c)(8)]

For each gaseous fuel at each configuration for which you have elected to use the **Tier 3 (Equation C-5)** methodology, you are also required to report the following additional information:

- Total number of valid molecular weight determinations [98.36(e)(2)(iv)(D)]
- Total number of molecular weight substitute data values [98.36(e)(2)(iv)(E)]
- Frequency of molecular weight determinations [98.36(e)(2)(iv)(B)]
 - Hourly
 - Daily
 - Weekly
 - Monthly
 - Semiannually
 - Quarterly
 - Other (specify)

Use the red-bordered text boxes to enter the required emissions information.

To calculate the emissions you have the option of using your own resources or alternatively you may use the following tool and set of instructions:

- Download the spreadsheet tool by clicking the link below one of the red-bordered text boxes labeled "Use Tier X spreadsheet to calculate"
- Fill in the spreadsheet completely using the instructions provided in the tool
- After completing the spreadsheet, copy the values calculated by the spreadsheet to the red-bordered text boxes on this page

When you have finished entering emission results for the unit, click **SAVE**.

Repeat this step until emissions information has been entered for each fuel combusted by the unit.

Step 3: Save Your Data

Once you have entered emissions information for all fuels combusted by the unit, click Subpart AA Overview

After you save the data on this page, the next time you open the page, the calculator on the top of the page will display the CO₂, CH₄, and N₂O process emissions, rounded to the nearest 0.1, 0.01, and 0.001 of a metric ton, respectively. The value displayed is for informational purposes only.

When CO₂, CH₄ and N₂O process emissions have been entered the Status column on the Unit and Furnace Summary will show "Complete" and the background color for that furnace will show as green.

Click image to expand

United States Environmental Protection Agency

e-GGRT Electronic Greenhouse Gas Reporting Tool

HOME FACILITY REGISTRATION FACILITY MANAGEMENT DATA REPORTING

2SubpartAA 1 (2010)

Subpart AA: Pulp and Paper Manufacturing

Subpart AA Overview » RF3in_range » Lime Kiln » **Fuel specific Emissions**

FUEL SPECIFIC EMISSIONS

Use this page to enter the annual GHG emissions information for this fuel. For additional information about the data collected on this page, please use the e-GGRT Help link(s) provided.

Annual CO₂ (metric tons) **5,730**

Annual CH₄ (metric tons) **0.11**

Annual N₂O (metric tons) **0.01**

CONFIGURATION-FUEL PERIOD

Unit or Group Name/ID RF3in_range

Fuel (Fuel Type) Natural Gas (Weighted U.S. Average) (Natural Gas)

Reporting Period 01/01/2010 - 12/31/2010

EQUATION C-1 SUMMARY AND RESULT

$CO_2 = 1 \times 10^3 \times \text{Fuel} \times \text{HRV} \times \text{EF}$

Hover over an element in the equation above to reveal a definition of that element.

Annual CO₂ emissions from combustion of the specified fuel **5730** (metric tons)

Use Equation C-1/C-8 spreadsheet to calculate

EQUATION C-8 SUMMARY AND RESULTS

$CH_4 \text{ or } N_2O = 1 \times 10^3 \times \text{Fuel} \times \text{HRV} \times \text{EF}$

Hover over an element in the equation above to reveal a definition of that element.

Annual CH₄ emissions from combustion of the specified fuel **0.11** (metric tons)

Use Equation C-1/C-8 spreadsheet to calculate

Annual N₂O emissions from combustion of the specified fuel **0.011** (metric tons)

Use Equation C-1/C-8 spreadsheet to calculate

CO₂ EQUIVALENT EMISSIONS

CO₂ equivalent value for Annual CH₄ emissions **2.3** (metric tons)

Use Equation C-1/C-8 spreadsheet to calculate

CO₂ equivalent value for Annual N₂O emissions **3.3** (metric tons)

Use Equation C-1/C-8 spreadsheet to calculate

CANCEL SAVE

Paperwork Reduction Act Burden Statement | Contact Us

e-GGRT RY2010 R.44 | SPAA-FuelEmission

[Back to Top](#)

See Also

Screen Errors

[Using e-GGRT to Prepare Your Subpart AA Report](#)

[Subpart AA Summary Information for this Facility](#)

[Subpart AA Makeup Chemical Usage Information](#)

[Subpart AA Process Unit Information for Units NOT Monitored by CEMS](#)

[Subpart AA Process Unit Information for Units Monitored by CEMS](#)

[Subpart AA Emissions Information for Makeup Chemical Recovery](#)

[Subpart AA Emissions Information for Units NOT Monitored CEMS](#)

[Subpart AA Emissions Information for Units Monitored by CEMS](#)

[Subpart Validation Report](#)

Subpart AA Emissions Information for Units Monitored by CEMS

This page provides step-by-step instructions on how to enter and edit Subpart AA Pulp and Paper Manufacturing information for process units that are monitored by a Continuous Emissions Monitoring System (CEMS).

Step 1: Add a CEMS Monitoring Location (CML)

To add a CML, click the "Add a CEMS Monitoring Location" link below the CEMS MONITORING LOCATION (CML) SUMMARY table on the Subpart Overview page



The screenshot below is from Subpart G and is displayed as an example. The screen for other subparts may differ slightly.

Click image to expand

Step 2: Define a CML and report emissions information

For each CEMS Monitoring Location, provide the following information:

- A unique unit name or identifier for the CML (see also [About Unique Unit Names](#))
- An optional description or label for the CML
- The configuration of processes or process units that are monitored by the CML:
 - Single process or process unit that exhausts to a dedicated stack
 - Multiple processes or process units that share a common stack
 - Process or process unit that shares a common stack with one or more stationary fuel combustion units
- The types of fuel combusted in the unit(s) monitored by the CEMS
- The Tier 4/CEMS methodology start and end dates
- The quarter total of hourly CO₂ mass emissions for each quarter of the reporting year (metric tons) (*Do not cumulate emissions data between quarters*)
- The total annual CO₂ mass emissions measured by the CEMS (metric tons)
- An indication whether emissions reported for the CEMS include emissions calculated according to 98.33(a)(4)(viii) for a slipstream that bypassed the CEMS
- The total annual biogenic CO₂ emissions from the combustion of all biomass fuels combined (metric tons) (*if not applicable, enter '0'*)
- The total annual non-biogenic CO₂ emissions which includes fossil fuel, sorbent, and process CO₂ emissions (metric tons)
- The total annual CH₄ and N₂O emissions associated with the combustion of all [Table C-2](#) fuels combusted in all processes/process units monitored by the CEMS derived from application of [Equation C-10](#) (metric tons) (*if there are no combustion emissions in this CML, please enter '0'*)
- The total number of source operating hours in the reporting year
- The total operating hours in which a substitute data value was used in the emissions calculations for the CO₂ concentration parameter
- The total operating hours in which a substitute data value was used in the emissions calculations for the stack gas flow rate parameter
- If moisture correction is required and a continuous moisture monitor is used, the total operating hours in which a substitute data value was used in the emissions calculations for the stack gas moisture content parameter
- The total annual CO₂ emissions from the CEMS Monitoring Location (CML) Summary attributable to combustion (metric tons)

Do not leave any of these fields blank. If, for example, your facility has no biogenic CO₂ emissions, enter '0'.

For assistance in calculating annual CH₄ and N₂O emissions using [Equation C-10](#), access the optional calculation spreadsheet by clicking one of the links titled “[Use Equation C-10 spreadsheet to calculate](#)” located below each of the red emissions information data entry boxes and follow the provided instructions

Step 3: Identify process units monitored at a CML

To identify the process units monitored at a CML, first click the link titled “ADD/REMOVE a process unit that exhausts to this CEMS Monitoring Location” at the bottom of the page



The screenshot below is from Subpart G and is displayed as an example. The screen for other subparts may differ slightly.

Click image to expand

Facility ABC
Subpart G: Ammonia Manufacturing (2011)
 Subpart G Overview • Add/Edit CEMS Monitoring Location

CONTINUOUS EMISSION MONITORING SYSTEM (CEMS) MONITORING LOCATION (CML) INFORMATION
 Use this page to uniquely identify each CEMS Monitoring Location (CML) Summary and provide the annual GHG emissions and other information described below. Use the "ADD/REMOVE a Process Unit" link at the bottom of the page to identify the process unit(s) monitored by this CEMS Monitoring Location (CML) Summary. For additional information about the data collected on this page, please use the e-GGRT Help link(s) provided.

CONFIGURATION:
 CEMS Monitoring Location Name/ID: _____ (40 characters maximum)
 Description (optional): _____
 Configuration Type: Select _____
 Types of fuel combusted in the unit(s) monitored by the CEMS: _____ (200 characters maximum)

TIER 4 METHODOLOGY INFORMATION
 Calculation Methodology Start Date: 01/01/2011
 Calculation Methodology End Date: 12/31/2011

QUARTERLY CO₂ EMISSIONS
 Quarter 1: _____ (metric tons)
 Quarter 2: _____ (metric tons)
 Quarter 3: _____ (metric tons)
 Quarter 4: _____ (metric tons)

ANNUAL CO₂ EMISSIONS
 Total annual CO₂ mass emissions (biogenic and non-biogenic) measured by the CEMS: _____ (metric tons)
 Check this box to indicate that the emissions reported for the CEMS include emissions calculated according to 40 CFR 60.441(a) for a dipstream that bypassed the CEMS.
 Total annual biogenic CO₂ mass emissions: _____ (metric tons)
 Total annual non-biogenic CO₂ mass emissions (includes fossil fuel, sorbent, and process CO₂ emissions): _____ (metric tons)

EQUATION C-10 SUMMARY AND RESULTS

$$CH_4 \text{ or } N_2O = 0.001 \times (F)_{CH_4} \times EF$$
 Hover over an element in the equation above to reveal a definition of that element.
 Enter CH₄ and N₂O emissions from only combustion of Table C-2 Fuels directly below. If there are no combustion emissions from Table C-2 Fuels in this CEMS Monitoring Location, please enter 0.
 Total CH₄ emissions: _____ (metric tons) [Use Equation C-10 spreadsheet to calculate](#)
 Total N₂O emissions: _____ (metric tons) [Use Equation C-10 spreadsheet to calculate](#)

ADDITIONAL EMISSIONS INFORMATION
 Total number of source operating hours in the reporting year: _____ (hours)
 The total operating hours in which a substitute data value was used in the emissions calculations for CO₂ concentration: _____ (hours)
 The total operating hours in which a substitute data value was used in the emissions calculations for stack gas flow rate: _____ (hours)
 The total operating hours in which a substitute data value was used in the emissions calculations for stack gas moisture content (if moisture correction is required and a continuous moisture monitor is used): _____ (hours)

CEMS MONITORING LOCATION PROCESS UNITS
 Process Unit Name/Identifier: _____
 There are no process units monitored by CEMS available for selection.
 ADD/REMOVE/EDIT a process unit that exhausts to this CEMS Monitoring Location
 CANCEL SAVE

On the CML Process Units Selection page, use the check boxes to select the process unit(s) monitored at this CML. This will indicate that the unit(s) selected vent emission through the stack monitored by this CML.



The screenshot below is from Subpart G and is displayed as an example. The screen for other will differ slightly depending on the number of units with emissions monitored by a single CML at your facility.

Click image to expand

SUBG 4 (2011)
Subpart G: Ammonia Manufacturing
 Subpart G Overview • Buster Ammonia • Add/Edit Process Units

IDENTIFY PROCESS UNITS(S)
 Use this page to select each process unit that is monitored by the CML. For additional information about this page, please use the e-GGRT Help link(s) provided. * denotes a required field

PROCESS UNIT: GASEOUS CEMS
 Is this process unit monitored by the CEMS Monitoring Location? (check if true)

CANCEL SAVE

Subpart Y also collects the CO₂ emissions from this CEMS Monitoring Location that are attributable to process CO₂ emissions from this process

unit (metric tons).

Click image to expand

The screenshot shows the 'e-GGRT Help' page for 'Facility ABC (2010)' under 'Subpart Y: Petroleum Refineries'. The main heading is 'IDENTIFY PROCESS UNITS'. Below this, there is a brief instruction: 'Use this page to select each process unit that is monitored by the CEMS Monitoring Location (CML) Summary. For additional information about this page, please use the e-GGRT Help link(s) provided.' A red asterisk indicates a required field. The form contains three sections for process units: CEMS1, CEMS3, and CEMS2. Each section has a checkbox for 'Is this process unit monitored by the CEMS Monitoring Location?' and a text input for 'CO₂ emissions from this CEMS Monitoring Location that are attributable to process CO₂ emissions from this process unit'. For CEMS1 and CEMS3, the checkboxes are checked and the emission values are 8000 and 7100 metric tons, respectively. For CEMS2, the checkbox is unchecked. At the bottom of the form, there are 'CANCEL' and 'SAVE' buttons.

When finished selecting process unit for the CML and entering additional required information (if applicable), click SAVE. You should then be directed back to the Add/Edit a CML Location form and see the units you selected listed in the CEMS MONITORING LOCATION (CML) PROCESS UNITS table.

Step 4: Save entered data for a CML

When you have finished entering data for a CML, click SAVE. You will then return to the Subpart Overview page. You will see the status of data entry for the CML updated to "Complete" in the Status column in the CEMS MONITORING LOCATION (CML) SUMMARY table.

If you don't have all the data, you can enter some now, save it, and finish later by clicking on the hyperlinked name of the CML in the CEMS MONITORING LOCATION (CML) SUMMARY table.

After you save the data on this page, the next time you open the page, the calculator on the top of the page will display the CO₂ process emissions for the CML, rounded to the nearest 0.1 of a metric ton. The value displayed is for informational purposes only.



Note: the screenshot below is from Subpart G and is displayed as an example. The screen for other subparts will differ slightly.

Click image to expand

Step 5: Repeat Steps 1-4

Repeat Steps 1-4 until emissions information has been entered for all CMLs. If you have missed something, the validation report messages will help you identify any incomplete entries.

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See Also

Screen Errors

[Using e-GGRT to Prepare Your Subpart AA Report](#)

[Subpart AA Summary Information for this Facility](#)

[Subpart AA Makeup Chemical Usage Information](#)

[Subpart AA Process Unit Information for Units NOT Monitored by CEMS](#)

[Subpart AA Process Unit Information for Units Monitored by CEMS](#)

[Subpart AA Emissions Information for Makeup Chemical Recovery](#)

[Subpart AA Emissions Information for Units NOT Monitored CEMS](#)

[Subpart AA Emissions Information for Units Monitored by CEMS](#)

[Subpart Validation Report](#)

Using Subpart AA Calculation Spreadsheets

i These optional spreadsheets are provided to assist reporters in calculating emissions and in keeping records of these calculations.

Reporters are required to keep records of these calculations under 40 CFR 98.3(g) and additional subpart-specific provisions, but are not required to use these spreadsheets or to submit any spreadsheets to EPA.

Spreadsheets may include inputs to emission equations, reporting some of which EPA deferred until 2015. (See 76 FR 53057, published August 25, 2011, <http://www.gpo.gov/fdsys/pkg/FR-2011-08-25/pdf/2011-21727.pdf>).

Overview

This help page provides guidance for working with the supplemental Subpart AA calculation spreadsheet. The guidance provides step-by-step instructions for the following tasks:

- [Selecting the Appropriate Spreadsheet](#)
- [Downloading a Spreadsheet](#)
- [Using the Equation AA-1 Calculation Spreadsheet](#)
- [Using the Equation AA-2 Calculation Spreadsheet](#)
- [Using the Equation AA-3 Calculation Spreadsheet](#)

Specific information on each of the spreadsheet tools is provided below:

Calculation Spreadsheet (click to download)	Calculation Results	Instructions (click to view)
Equation AA-1 Calculation Spreadsheet.xls	Biogenic CO ₂ , CH ₄ , N ₂ O	AA-1 Help
Equation AA-2 Calculation Spreadsheet.xls	Biogenic CO ₂	AA-2 Help
Equation AA-3 Calculation Spreadsheet.xls	CO ₂	AA-3 Help

Selecting the Appropriate Spreadsheet

Subpart AA requires a facility to report annual biogenic CO₂, CH₄, and N₂O emissions from the combustion of spent liquor solids and annual CO₂ emissions from make-up chemical use. To calculate the emissions, use the three equations below. Use different spreadsheet tools for different furnaces or combustion units as required.

For each kraft or soda mill chemical recovery furnace, calculate annual biogenic CO₂, CH₄, and N₂O emissions from the combustion of spent liquor solids, using Equation AA-1 and the Equation AA-1 Calculation Spreadsheet. Equation AA-1 is provided below:

(Equation AA-1)

$$CO_2, CH_4, \text{ or } N_2O \text{ from biomass} = (0.90718) * \text{Solids} * \text{HHV} * \text{EF}$$

For each chemical recovery combustion unit, users should calculate annual CH₄ and N₂O emissions from the combustion of spent liquor solids using Equation AA-1 and the Equation AA-1 Calculation Spreadsheet and should calculate annual biogenic CO₂ emissions from the combustion of spent liquor solids using Equation AA-2 and the Equation AA-2 Calculation Spreadsheet. Equation AA-2 is provided below:

(Equation AA-2)

$$\text{Biogenic } CO_2 = \frac{44}{12} * \text{Solids} * \text{CC} * (0.90718)$$

For each facility with make-up chemical use, users should calculate annual CO₂ emissions from make-up chemical use using Equation AA-3 and the Equation AA-3 Calculation Spreadsheet. Equation AA-3 is provided below:

(Equation AA-3)

$$CO_2 = \left[M_{(CaCO_3)} * \frac{44}{100} + M_{(Na_2CO_3)} * \frac{44}{105.99} \right] * 1000 \text{ kg / metric ton}$$

Downloading a Spreadsheet

Calculation spreadsheets for Subpart AA may be downloaded by clicking one of the links in the first column of the table below. Users may also jump to instructions for each spreadsheet by clicking one of the links in the third column.

Calculation Spreadsheet (click to download)	Calculation Results	Instructions (click to view)
Equation AA-1 Calculation Spreadsheet.xls	Biogenic CO ₂ , CH ₄ , N ₂ O	AA-1 Help
Equation AA-2 Calculation Spreadsheet.xls	Biogenic CO ₂	AA-2 Help
Equation AA-3 Calculation Spreadsheet.xls	CO ₂	AA-3 Help

Using a Spreadsheet to Make Calculations

The guidance provided in this section applies to each of the calculation spreadsheets for Subpart AA. Additional guidance is provided for each individual spreadsheet in the sections below.

Color coding

The calculation spreadsheets contain green input cells, gray informational cells, and red-bordered results cells filled with yellow or white. Users should use green input cells to enter all data specific to their facility, unit, or process. Gray informational cells contain parameter names, column and row headings, equation constants and subtotals. Calculation results are displayed in red-bordered results cells filled with yellow or white. For red-bordered, yellow-filled results cells, the values in these cells should be entered in the appropriate and separate calculation spreadsheet (as directed below cell) where additional calculations will be made. For red-bordered, white filled results cells, the values in these cells should be entered in e-GGRT for the appropriate process units. All cells that are not green input cells are locked and cannot be modified.

	Green input cell (data entry)
	Gray informational cells (locked)
	Red-bordered, yellow-filled results cells (enter in appropriate and separate calculation spreadsheet)
	Red-bordered, white filled results cells (enter in e-GGRT)

Stop and Warning Messages

The calculation spreadsheets will display a stop message if the user enters a value that is invalid or a warning message if the user enters a value outside the EPA estimated range for a particular data element. For invalid data entries, the stop messages will not allow a user to proceed and the user must reenter valid data before moving forward. For data entries that are outside the EPA estimated range for a particular data element, the warning messages will allow a user to proceed if the user deems the entered value to be accurate.

Multiple Furnaces or Combustion Units

Users with multiple furnaces or combustion units should use separate spreadsheets for each furnace or combustion unit. Users should not aggregate data for multiple furnaces or combustion units when using these spreadsheets.

Using the Equation AA-1 Calculation Spreadsheet

Use the Equation AA-1 Calculation Spreadsheet to calculate the annual biogenic CO₂, CH₄, and N₂O emissions from the combustion of spent liquor solids for each kraft or soda mill chemical recovery furnace. Also use the Equation AA-1 Calculation Spreadsheet to calculate the annual CH₄ and N₂O emissions from the combustion of spent liquor solids for each chemical recovery combustion unit. A separate spreadsheet should be used for each furnace or combustion unit. The Equation AA-1 Calculation Spreadsheet performs the calculations using Equation AA-1, provided below.

(Equation AA-1)	$CO_2, CH_4, \text{ or } N_2O \text{ from biomass} = (0.90718) * \text{Solids} * \text{HHV} * \text{EF}$
------------------------	--

Begin by entering the facility name, your name, the unit name or identifier, reporting period, and any additional comments in the green cells of the

general information table located immediately below the equation in the spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ ID:	
Reporting Period:	
Comments:	
Unit Type:	

Next, enter the requested information in the green cells in the Input Data table.

Input Data

[Solids] = Mass of spent liquor solids combusted (short tons per year) determined according to §98.274(b)		
[HHV] = Annual high heat value of the spent liquor solids (mmBtu per kilogram) determined according to §98.274(b)		
[CO ₂ EF] = Default or site-specific emission factor for CO ₂ , from Table AA-1 of this subpart (kg CO ₂ per mmBtu)		The default values for [CO ₂ EF] are listed on the Table AA-1' tab
[CH ₄ EF] = Default or site-specific emission factor for CH ₄ , from Table AA-1 of this subpart (kg CH ₄ per mmBtu)	0.03	The default value for [CH ₄ EF] is 0.03
[N ₂ O EF] = Default or site-specific emission factor for N ₂ O, from Table AA-1 of this subpart (kg N ₂ O per mmBtu)	0.005	The default value for [N ₂ O EF] is 0.005

The spreadsheet will calculate the annual biogenic CO₂, CH₄, and N₂O emissions from the combustion of spent liquor solids. These calculated values will be displayed in the red-bordered cells at the bottom of the spreadsheet. These values should be entered in e-GGRT for this furnace or combustion unit.

Annual Biogenic CO₂ Emissions (metric tons) from Equation AA-1

[CO ₂ from Biomass] = Biogenic CO ₂ emissions from spent liquor solids combustion (metric tons per year)	0.00
--	------

Enter this value in e-GGRT for a chemical recovery furnace. For a chemical recovery combustion unit, do not enter this value. Instead, use Equation AA-2.

Annual Biogenic CH₄ Emissions (metric tons) from Equation AA-1

[CH ₄ from Biomass] = Emissions of CH ₄ from spent liquor solids combustion (metric tons per year)	0.00
--	------

Enter this value in e-GGRT

Annual Biogenic N₂O Emissions (metric tons) from Equation AA-1

[N ₂ O from Biomass] = Emissions of N ₂ O from spent liquor solids combustion (metric tons per year)	0.00
--	------

Enter this value in e-GGRT

Using the Equation AA-2 Calculation Spreadsheet

Use the Equation AA-2 Calculation Spreadsheet to calculate the annual biogenic CO₂ emissions from the combustion of spent liquor solids for each chemical recovery combustion unit. Use a separate spreadsheet for each combustion unit. The Equation AA-2 Calculation Spreadsheet performs the calculation using Equation AA-2, provided below.

(Equation AA-2)	$\text{Biogenic CO}_2 = \frac{44}{12} * \text{Solids} * \text{CC} * (0.90718)$
-----------------	--

Begin by entering the facility name, your name, the unit name or identifier, reporting period, and any additional comments in the green cells of the general information table located immediately below the equation in the spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ ID:	
Reporting Period:	
Comments:	
Unit Type:	Chemical Recovery Combustion Unit

Next, enter the requested information in the green cells in the Input Data table.

Input Data

[Solids] = Mass of the spent liquor solids combusted (short tons per year) determined according to §98.274(b)	
[CC] = Annual carbon content of the spent liquor solids, determined according to §98.274(b) (percent by weight, expressed as a decimal fraction, e.g., 95% = 0.95)	

The spreadsheet will calculate the annual biogenic CO₂ emissions from the combustion of spent liquor solids. This calculated value will be displayed in the red-bordered cells at the bottom of the spreadsheet. This value should be entered in e-GGRT for this combustion unit.

Annual Biogenic CO₂ Mass Emissions (metric tons) from Equation AA-2

[Biogenic CO ₂] = Annual CO ₂ mass emissions for spent liquor solids combustion (metric tons per year)	0.00
---	------

Enter this value in e-GGRT

Using the Equation AA-3 Calculation Spreadsheet

Use the Equation AA-3 Calculation Spreadsheet to calculate the annual CO₂ emissions from make-up chemical use. The Equation AA-3 Calculation Spreadsheet performs the calculation using Equation AA-3, provided below.

(Equation AA-3)

$$CO_2 = \left[M_{(CaCO_3)} * \frac{44}{100} + M_{(Na_2CO_3)} \frac{44}{105.99} \right] * 1000 \text{ kg / metric ton}$$

Begin by entering the facility name, your name, the unit name or identifier, reporting period, and any additional comments in the green cells of the general information table located immediately below the equation in the spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ID:	
Reporting Period:	
Comments:	
Unit Type:	Makeup Chemical Use

Next, enter the requested information in the green cells in the Input Data table.

Input Data

[M _(CaCO₃)] = Makeup quantity of CaCO ₃ used for the reporting year (metric tons per year)	
[M _(Na₂CO₃)] = Makeup quantity of Na ₂ CO ₃ used for the reporting year (metric tons per year)	

The spreadsheet will calculate the annual CO₂ emissions from make-up chemical use. This calculated value will be displayed in the red-bordered cells at the bottom of the spreadsheet. This value should be entered in e-GGRT for this combustion unit.

Annual CO₂ Mass Emissions from Equation AA-3 in Units of Kilograms

[CO ₂] = CO ₂ mass emissions from makeup chemicals (kilograms/yr)	0.00
--	------

Annual CO₂ Mass Emissions from Equation AA-3 in Units of Metric Tons

[CO ₂] = CO ₂ mass emissions from makeup chemicals (metric tons/yr)	0.00
--	------

 Enter this value in e-GGRT

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