Subpart W: Petroleum and Natural Gas Systems

Version R.10

1.) Select the applicable industry segment for this workbook using the dropdown list:

Note: One workbook must be submitted for each industry segment. If your facility is require

Industry Segment:

List of Subpart W Industry Segments:

2.) Fill out the following table with general information about this facility:

Facility Name:
GHGRP ID:
Reporting Period:
Comments:

3.) Fill out the applicable source reporting forms for your industry segment, as indicate

Onshore Production [98.236(aa)(1)]

Facility Overview [98.236(aa)(2-11)]
Natural Gas Pneumatic Devices [98.236(b)]
Natural Gas Driven Pneumatic Pumps [98.236(c)]
Acid Gas Removal Units [98.236(d)]
Dehydrators [98.236(e)]
Well Venting for Liquids Unloading [98.236(f)]
Completions and Workovers with Hydraulic Fracturing [98.236(g)]
Completions and Workovers without Hydraulic Fracturing [98.236(h)]
Blowdown Vent Stacks [98.236(i)]
Atmospheric Storage Tanks [98.236(j)]
Transmission Storage Tanks [98.236(k)]
Well Testing [98.236(l)]
Associated Gas Venting and Flaring [98.236(m)]
Flare Stacks [98.236(n)]
Centrifugal Compressors [98.236(o)]
Reciprocating Compressors [98.236(p)]
Equipment Leaks Surveys and Population Counts [98.236(q,r)]
Offshore Petroleum and Natural Gas Production [98.236(s)]
Enhanced Oil Recovery Injection Pumps [98.236(w)]
Enhanced Oil Recovery Hydrocarbon Liquids [98.236(x)]
Combustion Equipment at Onshore Petroleum and Natural Gas Production Facilities, Onshore Petroleum and Natural Gas Gathering and Boosting Facilities, and Natural gas Distribution Facilities [98.236(z)]

Updated:

ed to report emissions under more than one industry segment, a workbook should be filled

Offshore petroleum and natural gas production [98.230(a)(1)]

Onshore petroleum and natural gas production [98.230(a)(2)]

Onshore natural gas processing [98.230(a)(3)]

Onshore natural gas transmission compression [98.230(a)(4)]

Underground natural gas storage [98.230(a)(5)]

Liquefied natural gas (LNG) storage [98.230(a)(6)]

LNG import and export equipment [98.230(a)(7)]

Natural gas distribution [98.230(a)(8)]

Onshore petroleum and natural gas gathering and boosting [98.230(a)(9)]

Onshore natural gas transmission pipeline [98.230(a)(10)]

ed with a green "Yes", below:

Required for 0:	Go to Reporting Spreadsheet	Total Reported CO_2 Emissions (mt CO_2)
#N/A	Go to Onshore Production Tab	N/A

#N/A	Go to Facility Overview Tab	N/A
#N/A	Go to NG Pneumatic Devices Tab	#N/A
#N/A	Go to NG Driven Pneumatic Pumps Tab	#N/A
#N/A	Go to Acid Gas Removal Units Tab	#N/A
#N/A	Go to Dehydrators Tab	#N/A
#N/A	Go to Liquids Unloading Tab	#N/A
#N/A	Go to Wells with Fracturing Tab	#N/A
#N/A	Go to Wells without Fracturing Tab	#N/A
#N/A	Go to Blowdown Vent Stacks Tab	#N/A
#N/A	Go to Atmospheric Storage Tanks Tab	#N/A
#N/A	Go to Transmission Storage Tanks Tab	#N/A
#N/A	Go to Well Testing Tab	#N/A
#N/A	Go to Associated NG Tab	#N/A
#N/A	Go to Flare Stacks Tab	#N/A
#N/A	Go to Centrifugal Compressors Tab	#N/A
#N/A	Go to Reciprocating Compressors Tab	#N/A
#N/A	Go to Equipment Leaks Tab	#N/A
#N/A	Go to Offshore Emissions Tab	#N/A
#N/A	Go to EOR Injection Pumps Tab	#N/A
#N/A	Go to EOR Hydrocarbon Liquids Tab	#N/A
#N/A	Go to Combustion Equipment Tab	#N/A

Totals	**#N/A**

OMB Number: 2060-0629. Expiration Date: 03/

OMB Number: 2060-0751
Expiration Date: day/month/year

11/22/2024

out for each industry segment under which that facility falls.

Total Reported CH_4 Emissions (mt CH_4)	Total Reported N_2O Emissions (mt N_2O)
N/A	N/A

N/A	N/A
#N/A	N/A
#N/A	N/A
N/A	N/A
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N/A	N/A
N/A	N/A
#N/A	#N/A

		Total CO2e Emissions (mt CO_2e)
#N/A	#N/A	#N/A

Onshore Petroleum and Natural Gas

Version

Worksheet Instructions:
Each onshore petroleum and natural gas product
If a quantity required to be reported is zero, you r
Basin means geologic provinces as defined by th Volume 75, Number 10 (October 1991) (incorpor 1978 (incorporated by reference, see 98.7).
Sub-basin category, for onshore natural gas pro following five formation types: Oil, high permeabi millidarcy permeability, and tight gas reservoirs w are considered gas wells; gas wells producing fro hydrocarbon liquids (with or without gas) and do tight gas reservoir rock formations are considered
NOTE: Basins 221 (Gulf Coast Basin - LA) and 2
NOTE: The sub-basin formation type options bel
NOTE: Kern County, California, makes use of tw

External Links:
Subpart W Resources Page
Optional Calculation Spreadsheet
Help Resources

Table AA.1.i Onshore petroleum and natural g

Select the basin associated with this facility [98.236(aa)(1)(i)]

Quantity of gas produced in the calendar year from wells (thousand standard cubic feet) **[98.236(aa)(1)(i)(A)]**
Quantity of gas produced in the calendar year for sales (thousand standard cubic feet) **[98.236(aa)(1)(i)(B)]**
Quantity of crude oil and condensate produced in the calendar year for sales (barrels) **[98.236(aa)(1)(i)(C)]**

Table AA.1.ii Onshore petroleum and natural g

Select the County and State in which the Sub-Basin is located **[98.236(aa)(1)(ii)(A-B)]**

Table AA.1.iii Onshore Petroleum and Natural

This table combines well-specific reporting requir

If you have multiple sets of activity data to report
the well ID, the additional data flag, and the work

If you are copying data into this table from anothe
Special / Values when pasting. Failure to cut and

For optimal visibility while completing this table, s

Do not skip rows between entries.

****Well ID number means the unique and permar*
permitting authority. US Well Numbers follow a fo

Well ID Number [98.236(aa)(1)], [98.236(f)(1)(ii)], [98.236(f)(1)(xi)(A)], [98.236(f)(1)(xii)(A)], [98.236(f)(2)(i)], [98.236(g)(1)], [98.236(g)(5)(ii)], [98.236(g)(6)(iii)], [98.236(h)(1)(i)], [98.236(h)(2)(i)], [98.236(h)(3)(i)], [98.236(h)(4)(i)], [98.236(l)(1)(ii)], [98.236(l)(2)(ii)], [98.236(l)(3)(ii)], [98.236(l)(4)(ii)], [98.236(m)(1)], [98.236(m)(7)(i)], [98.236(m)(8)(i)]

Table AA.1.iv Missing Data Procedures Used

We

s Production Facility Level Requirements U

R.10

tion facility must report the information specified in 98.236(a

nust report zero as the value.

ne American Association of Petroleum Geologists (AAPG) G
ated by reference, see 98.7) and the Alaska Geological Pro

duction, means a subdivision of a basin into the unique com
lity gas, shale gas, coal seam, or other tight gas reservoir ro
vith ≤0.1 millidarcy permeability. Permeability for a reservoir
om more than one of these formation types shall be classifie
not meet the definition of a gas well in this sub-basin catego
d to be in the formation that the gas well belongs to and not

222 (Gulf Coast Basin - TX) are listed collectively under Bas

ow include "Other tight reservoir rock" -- this corresponds to

o county codes (029 and 030). For GHGRP reporting purpo

https://www.epa.gov/ghgreporting/subpart-w-petroleum-and
https://www.ccdsupport.com/confluence/display/help/Option
https://www.ccdsupport.com/confluence/display/help/Subpa

Onshore petr
Onshore petroleum
Onshore petr

jas production: Basin Characterization

gas production: Sub-Basin Characterization

Select the Formation Type of the Sub-Basin [98.236(aa)(1)(ii)(C)]

l Gas Production: Well Characterization

rements for 98.236(aa)(1), (f), (g), (h), (l) and (m). Complete

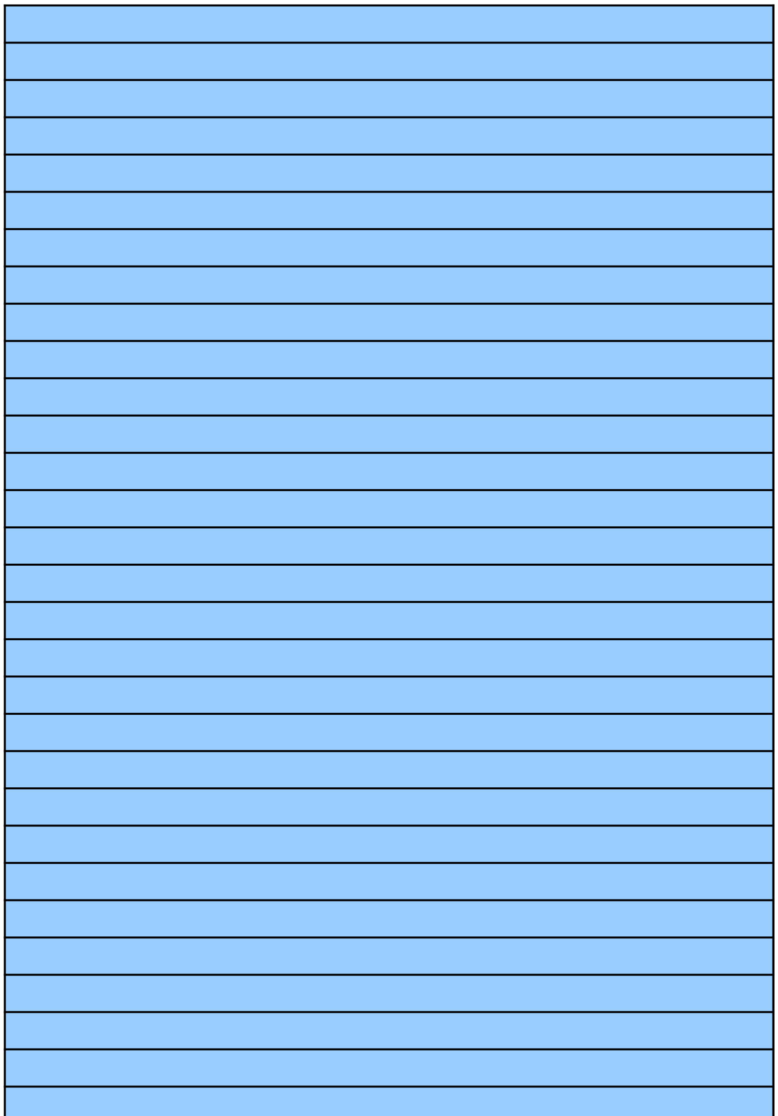
for a specific emission source type, enter these data in sep
over data on the subsequent row; leave other cells blank sc

er file, the acceptable enumerations for this table's fields car
l paste as directed may damage your reporting form, forcing

set "View/Freeze Pane/Freeze pane" option at Cell D274.

nent identification number assigned to a petroleum or natura
ormat of XX-YYY-ZZZZZ, where XX represents a state code

Additional data indicator



for Well-Specific Parameters

ell ID Number

nder 98.236(aa)(1)

Back to Summary Tab

a)(1). In addition, certain well-specific requirements of 98.236(f), (g), (h), (l), a

ieologic Note: AAPG–CSD Geologic Provinces Code Map: AAPG Bulletin, Pre
vince Boundary Map, Compiled by the American Association of Petroleum Geo

ibination of wells with the surface coordinates within the boundaries of an indiv
ock. The distinction between high permeability gas and tight gas reservoirs sha
type shall be determined by engineering estimate. Wells that produce from hig
d into only one type based on the formation with the most contribution to produ
ory definition are considered to be in the oil formation. All emission sources tha
in the oil formation.

sin 220.

the "other tight gas reservoir rock" type described in the 98.238 definitions.

ses, both 029 and 030 are accepted.

d-natural-gas-systems
ial+Calculation+Spreadsheet+Instructions
irt+W+-+Petroleum+and+Natural+Gas+Systems

oleum and natural gas production: Basin Characterization [Table AA.1.i]:
n and natural gas production: Sub-Basin Characterization [Table AA.1.ii]:
oleum and natural gas production: Well Characterization [Table AA.1.iii]:
For Missing data procedures [Table AA.1.iv]:

Sub-Basin ID

those columns relevant to the activities conducted at each well.

arate rows, flagging the additional rows in Col C. For example, if a well has bo
that no data for a particular well are repeated.

n be found at the help resources site listed at the top of this page. Copy and pa
you to start again with an empty form. Use of the Paste Special / Values will e

al gas well. If the well has been assigned a US Well Number, the well ID numbe
, YYY represents a county code, and ZZZZZ are digits specific to the well.

Sub-basin [98.236(aa)(1)], [98.236(f)(1)(i)], [98.236(g)(1)], [98.236(h)(1)(i)], [98.236(h)(2)(i)], [98.236(h)(3)(i)], [98.236(h)(4)(i)], [98.236(m)(1)], [98.236(m)(7)], [98.236(m)(8)]

Parameters (specify
(f) Liquids Unloading: Wells tested and subject to 98.236(f)(1)(xi) and (xii)

#N/A

nd (m) should be reported below.

pared by Richard F. Meyer, Laure G. Wallace, and Fred J. Wagner, Jr.,
ologists Committee on Statistics of Drilling in Cooperation with the USGS,

idual county and subsurface completion in one or more of each of the
ll be designated as follows: High permeability gas reservoirs with >0.1
gh permeability gas, shale gas, coal seam, or other tight gas reservoir rock
uction as determined by engineering knowledge. All wells that produce
t handle condensate from gas wells in high permeability gas, shale gas, or

CLICK HERE
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Best Available Monitoring Methods (BAMM) and Mis

Were BAMM used for any parameters to calculate GHG emissions?	Provide a brief description of the BAMM used, parameter measured, and time period.
BAMM not available for Onshore Production	

RETURN TO TOP

Number of producing wells at the end of the calendar year [98.236(aa)(1)(ii)(D)]	Number of producing wells acquired during the calendar year [98.236(aa)(1)(ii)(E)]

RETURN TO TOP

th completions and workover activity, report the completions data on one row,

aste into only the blue cells. (The gray cells are write-protected and will therefo
ensure that formatting and cell protection is not altered.

er required in this subpart is the US Well Number. If a US Well Number has no

Well-specific requirements Select all applic	
Producing at end of calendar year? [98.236(aa)(1)(ii)(D)]	Producing well acquired during calendar year? [98.236(aa)(1)(ii)(E)]

y only one per row)
(g) Completions and workovers with Hydraulic Fracturing: Wells assessed using Eq. W-10A, W-12C or W-10B

11/22/2024

ssing Data

Were missing data procedures used for any parameters to calculate GHG emissions? **[98.235]**

Number of producing wells divested during the calendar year [98.236(aa)(1)(ii)(F)]	Number of wells completed during the calendar year [98.236(aa)(1)(ii)(G)]	Number of wells permanently taken out of production [98.236(aa)(1)(ii)(H)]

and report the workover data on a separate, subsequent row. In this example, enter only

re cause the "paste" function to fail if they are included in the copied cells.) Use Paste

t been assigned to the well, the well ID number is the identifier established by the well's

s for facilities subject to 98.236(aa)(1) able columns for each well		
Producing well divested during calendar year? [98.236(aa)(1)(ii)(F)]	Completed during calendar year? [98.236(aa)(1)(ii)(G)]	Permanently shut-in and plugged during calendar year? [98.236(aa)(1)(ii)(H)]

Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]

Average mole fraction of CH_4 in produced gas [98.236(aa)(1)(ii)(I)]	Average mole fraction of CO_2 in produced gas [98.236(aa)(1)(ii)(J)]

RETURN TO LIQUIDS UNLOADING

For permanently shut-in and plugged wells during the calendar year, the quantity of natural gas produced and sent to sale in the calendar year (thousand standard cubic feet mscf) [98.236(aa)(1)(iii)(C)]	For permanently shut-in and plugged wells during the calendar year, the quantity of quantity of crude oil and condensate produced and sent to sale in the calendar year (barrels) [98.236(aa)(1)(iii)(D)]
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Procedures used

[98.235(h)]

Complete these columns ONLY for sub-basins with oil fo	
Average Gas-to-Oil (GOR) Ratio of all wells (thousand standard cubic feet per barrel) [98.236(aa)(1)(ii)(K)]	Average API gravity of all wells (degrees) [98.236(aa)(1)(ii)(L)]

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Well-specific requirements for facilities with L

Calculation Method [98.236(f)(2)(ii)]

RETURN TO TOP

ormations
Average Low Pressure Separator Pressure (psig) **[98.236(aa)(1)(ii)(M)]**

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Liquids Unloading subject to 98.236(f)

Wells tested and subject

Tubing Diameter Group/Pressure Group [98.236(f)(1)(ii)]	Were Plunger Lifts used? [98.236(f)(1)(iii)]	Casing pressure (psia) [98.236(f)(1)(xi)(B)]
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to 98.236(f)(1)(xi) and (xii)

Internal casing diameter (inches) [98.236(f)(1)(xi)(C)]	Tubing pressure (psia) [98.236(f)(1)(xii)(B)]	Internal tubing diameter (inches) [98.236(f)(1)(xii)(C)]
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RETURN TO COMPLETIONS AND WORKOVERS WIT

Depth of the Well (feet) [98.236(f)(1)(xi)(D)] [98.236(f)(1)(xii)(D)]	Average flow rate of the measured well venting, FR (standard cubic feet per hour) [98.236(f)(1)(xi)(E)] [98.236(f)(1)(xii)(E)]	Completions or Workovers [98.236(g)]

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*Note: If Equation W-10A is used, the operational practices for the measured well should be similar to the wells in the sub-basin for which the well is considered representative. If any of the following W-10A parameters are zero or cannot be determined for the well even using missing data procedures, for purposes of Equation W-10A the well would not be considered a representative well and the well should be listed as a Calculated Well: $T_{p,i}$, $T_{p,s}$, $PR_{s,p}$, FRM_i, FRM_s, $FR_{p,i}$, $FR_{s,p}$, GOR_p, and V_p.

Well-spe

Well Type [98.236(g)(2)]	Is gas flared? [98.236(g)(2)]	Reduced Emission Completion or Workover? [98.236(g)(2)]

ecific requirements for facilities with Completions or Workovers With Hydra

Oil or Gas Well [98.236(g)(2)]	Equation Used (Select) [98.236(g)(4)]

ulic Fracturing subject to 98.236(g)

When using Equation W-10A	
Are the only wells in the sub-basin used to calculate "Measured average flowback rates", "GOR" or "Volume of oil produced" wildcat or delineation wells subject to a 2-year delay in reporting? [98.236(g)(5)(iii)(A)] [98.236(g)(5)(iii)(B)] [98.236(g)(5)(ii)]	Measured average flowback rate for W-10A measured well, $FR_{s,p}$ (standard cubic feet per hour) [98.236(g)(5)(ii)]

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	When Using Equation W-
Was the flow rate during the initial flowback period determined using a multiphase flowmeter upstream of a separator for any measured well in the sub-basin? [98.236(g)(5)(iv)]	Gas to oil ratio, GOR_p (standard cubic feet per barrel of oil) [98.236(g)(5)(iii)(A)]

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-10A and Equation W-12C

Volume of oil produced during first 30 days of production after completion of newly drilled well, V_p (barrels) [98.236(g)(5)(iii)(B)]	Flow volume vented or sent to a flare for each well in the sub-basin, $FV_{s,p}$ (standard cubic feet) [98.236(g)(6)(i)]

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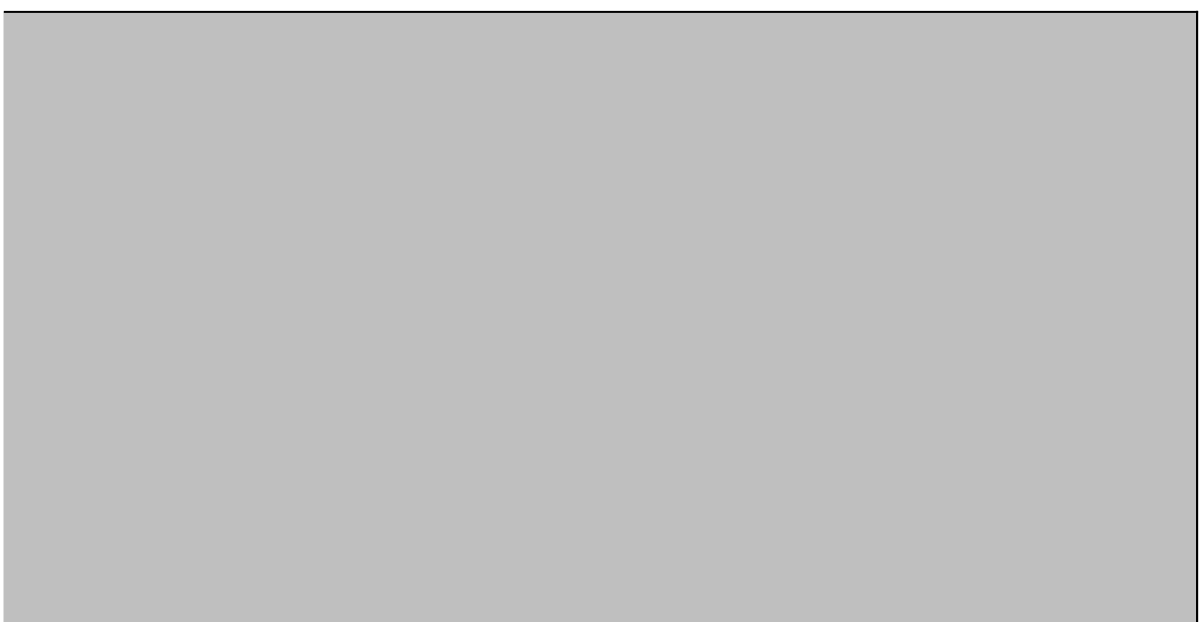

When Using Equation W-10B	
Flow rate at the beginning of the period of time when sufficient quantities of gas are present to enable separation of each well in the sub-basin, $FR_{p,i}$ (standard cubic feet per hour) [98.236(g)(6)(ii)]	If a multiphase flowmeter was used to measure the flow rate during the initial flowback period, the average flow rate measured by the multiphase flow meter from the initiation of flowback to the beginning of the period of time when sufficient quantities of gas present to enable separation, $FR_{p,i}$ (standard cubic feet per hour) [98.236(g)(6)(iii)]

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RETURN TO COMPLETIONS AND WORKOVERS WITHOUT HYDRAULIC FRACTURING

Well-specific requirements for facilities with Completions or Workovers WITHOUT Hydrauli
98.236(h)

Completions or Workovers [98.236(h)]	Flared? [98.236(h)]

	RETURN TO WELL TESTING
c Fracturing subject to	Well-specific requirements for facilities with emissions fr to 98.236(l)

Vented to atmosphere [98.236(h)]	Equation used to calculate annual volumetric natural gas emissions? [98.236(l)]	Were well testing emissions vented? [98.236(l)]

	RETURN TO ASSOCIATED GAS
rom Well Testing subject	Well-specific requirements for facilities with Associated Gas emissions subject to 98.236(m)

Were well testing emissions flared? [98.236(l)]	If the well had associated natural gas, was it vented? [98.236(m)(1)]	If the well had associated natural gas, was it flared? [98.236(m)(1)]

Industry Segment Specific Requirements

Version

Worksheet Instructions:
Each facility must report the information specified in para
If a quantity required to be reported is zero, you must rep
"Basin" means geologic provinces as defined by the Ame Wagner, Jr., Volume 75, Number 10 and the Alaska Geo
NOTE: Basins 221 and 222 are listed collectively under B

External Links:
Subpart W Resources Page
Optional Calculation Spreadsheet
Help Resources

Offs

Table AA.2. Offshore Production as per [98.236(aa)(2

Total quantity of gas handled at the offshore platform in the calendar year (thousand standard cubic feet) [98.236(aa)(2)(i)]

Table AA.2.i. Offshore Production Information for Ea

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Table AA.3. Natural Gas Processing as per [98.236(a

Quantity of natural gas received at the gas processing plant in the calendar year (thousand standard cubic feet) [98.236(aa)(3)(i)]

Table AA.4. Natural Gas Transmission Compression

Quantity of gas transported through the compressor station in the calendar year (thousand standard cubic feet) [98.236(aa)(4)(i)]

Table AA.5. Underground Natural Gas Storage

Quantity of gas injected into storage in the calendar year (thousand standard cubic feet) [98.236(aa)(5)(i)]

Table AA.6. LNG import/export equipment

For LNG import equipment, report quantity imported in the calendar year (thousand standard cubic feet) [98.236(aa)(6)]

Table AA.7. LNG storage

Quantity of LNG added into storage in the calendar year (thousand standard cubic feet) [98.236(aa)(8)(i)]

Table AA.8. Natural Gas Distribution as per [98.236(a

Quantity of natural gas received at all custody transfer stations in the calendar year (thousand standard cubic feet) [98.236(aa)(9)(i)]

Table AA.9. Onshore petroleum and natural gas gath

Select the basin associated with this facility [98.236(a)(9)]

Table AA.10. Onshore natural gas transmission pipel

Quantity of natural gas received at all custody transfer stations in the calendar year (thousand standard cubic feet) [98.236(aa)(11)(i)]

Table AA.10.i Onshore natural gas transmission pipe

State [98.236(aa)(11)(vi)]

under 98.236

R.10 | [Back to Summary Tab]

agraphs (aa)(2) through (aa)(11) for its applicable industry segment.

port zero as the value.

erican Association of Petroleum Geologists, Geologic Note: AAPG–CSD Geologic Provinces Code
ological Province Boundary Map, compiled by the American Association of Petroleum Geologists C

Basin 220.

https://www.epa.gov/ghgreporting/subpart-w-petroleum-and-natural-gas-systems
https://www.ccdsupport.com/confluence/display/help/Optional+Calculation+Spreadsheet+Instructic
https://www.ccdsupport.com/confluence/display/help/Subpart+W+-+Petroleum+and+Natural+Gas+

Offshore Production [Table AA.2.]:
hore Production Information for Each Well Permanently Shut-in and Plugged [Table AA.2.i.]
Natural Gas Processing [Table AA.3.]:
Natural Gas Transmission Compression [Table AA.4.]:
Underground Natural Gas Storage [Table AA.5.]:
LNG import/export equipment [Table AA.6.]:
LNG storage [Table AA.7.]:
Natural Gas Distribution [Table AA.8.]:
Onshore petroleum and natural gas gathering and boosting [Table AA.9.]:
Onshore natural gas transmission pipeline [Table AA.10]:
Onshore natural gas transmission pipeline miles for each state [Table AA.10.i]:

)]

Total quantity of oil and condensate handled at the offshore platform in the calendar year (barrels) [98.236(aa)(2)(ii)]

ch Well Permanently Shut-in and Plugged

For each well permanently shut-in and plugged during the calendar year, the quantity of natural gas produced that is sent to sale in the calendar year (thousand standard cubic feet) [98.236(aa)(2)(iii)]	For each well permanently shut-in and plugged during the calendar year, the quantity of crude oil and condensate produced that is sent to sale in the calendar year (barrels) [98.236(aa)(2)(iv)]
[redacted]	

[redacted]

[redacted]

a)(3)]

Quantity of processed (residue) gas leaving the gas processing plant in the calendar year (thousand standard cubic feet) [98.236(aa)(3)(ii)]	Cumulative quantity of all NGLs (bulk and fractionated) received at the gas processing plant in the calendar year (barrels) [98.236(aa)(3)(iii)]

Number of compressors [98.236(aa)(4)(ii)]	Total compressor power rating of all compressors combined (hp) [98.236(aa)(4)(iii)]

RETURN TO TOP

Quantity of gas withdrawn from storage in the calendar year (thousand standard cubic feet) [98.236(aa)(5)(ii)]	Total storage capacity (thousand standard cubic feet) [98.236(aa)(5)(iii)]

RETURN TO TOP

For LNG export equipment, report quantity exported in the calendar year (thousand standard cubic feet) [98.236(aa)(7)]

RETURN TO TOP

Quantity of LNG withdrawn from storage in the calendar year (thousand standard cubic feet) [98.236(aa)(8)(ii)]	Total storage capacity (thousand standard cubic feet) [98.236(aa)(8)(iii)]

a)(9)]

Quantity of natural gas withdrawn from in-system storage in the calendar year (thousand standard cubic feet) [98.236(aa)(9)(ii)]	Quantity of natural gas added to in-system storage in the calendar year (thousand standard cubic feet) [98.236(aa)(9)(iii)]

ering and boosting as per [98.236(aa)(10)]

Quantity of gas received by the gathering and boosting facility in the calendar year (thousand standard cubic feet) [98.236(aa)(10)(i)]	Quantity of gas transported to a natural gas processing facility, a natural gas transmission pipeline, a natural gas distribution pipeline, or another gathering and boosting facility in the calendar year (thousand standard cubic feet) [98.236(aa)(10)(ii)]

line facilities as per [98.236(aa)(11)]

Quantity of natural gas withdrawn from in-system storage in the calendar year (thousand standard cubic feet) [98.236(aa)(11)(ii)]	Quantity of natural gas added to in-system storage in the calendar year (thousand standard cubic feet) [98.236(aa)(11)(iii)]

eline miles for each state in the facility

RETURN TO TOP

Miles of transmission pipeline [98.236(aa)(11)(vi)]

#N/A

Map: AAPG Bulletin, prepared by Richard F. Meyer, Laure G. Wallace, and Fred J. ommittee on Statistics of Drilling in Cooperation with the USGS, 1978.
ons -Systems

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Cumulative quantity of all NGLs (bulk and fractionated) leaving the gas processing plant in the calendar year (barrels) [98.236(aa)(3)(iv)]	Average mole fraction of CH_4 in natural gas received [98.236(aa)(3)(v)]

RETURN TO TOP

Average upstream pipeline pressure (psig) [98.236(aa)(4)(iv)]	Average downstream pipeline pressure (psig) [98.236(aa)(4)(v)]

Quantity of natural gas delivered to end users (thousand standard cubic feet) [98.236(aa)(9)(iv)]	Quantity of natural gas transferred to third parties such as other LDCs or pipelines (thousand standard cubic feet) [98.236(aa)(9)(v)]

RETURN TO TOP

Quantity of all hydrocarbon liquids received by the gathering and boosting facility in the calendar year (barrels) [98.236(aa)(10)(iii)]	Quantity of all hydrocarbon liquids transported to a natural gas processing facility, a natural gas transmission pipeline, a natural gas distribution pipeline, or another gathering and boosting facility in the calendar year (barrels) [98.236(aa)(10)(iv)]

RETURN TO TOP

Quantity of natural gas transferred to third parties such as LDCs or other transmission pipelines (thousand standard cubic feet) [98.236(aa)(11)(iv)]	Quantity of natural gas consumed by the transmission pipeline facility for operational purposes (thousand standard cubic feet) [98.236(aa)(11)(v)]

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Average mole fraction of CO_2 in natural gas received [98.236(aa)(3)(vi)]	Does the facility fractionate NGLs? [98.236(aa)(3)(vii)]

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Quantity of natural gas consumed by the LDC for operational purposes (thousand standard cubic feet) [98.236(aa)(9)(vi)]	Estimated quantity of gas stolen in the calendar year (thousand standard cubic feet) [98.236(aa)(9)(vii)]

Natural Gas Pneumatic Device Venting [98.236(b)]

Version R.10

Worksheet Instructions:

In accordance with 98.232, only the following industry segments must report data for natu

-Onshore petroleum and natural gas production [98.230(a)(2)]
-Onshore natural gas transmission compression [98.230(a)(4)]
-Underground natural gas storage [98.230(a)(5)]
-Onshore petroleum and natural gas gathering and boosting [98.230(a)(9)]

Table B.1 must be completed by all facilities with pneumatic devices subject to reporting u

Table B.2 is required for all pneumatic device vented emissions using calculation method

Table B.3 is required for all pneumatic device vented emissions using calculation method

Table B.4 is required for all pneumatic device vented emissions using calculation method

Table B.5 is required for all continuous high bleed and low bleed, or intermittent bleed pne

Table B.6.i is required for the identification of missing data procedures used for pneumatic

Table B.6.ii is required for the identification of missing data procedures used for pneumati

Table B.6.iii is required for the identification of missing data procedures used for pneumati

Table B.6.iv is required for the identification of missing data procedures used for pneumat

External Links:

Subpart W Resources Page	https://www.epa.gov/ghgreporting/subpar
Optional Calculation Spreadsheet	https://www.ccdsupport.com/confluence/
Help Resources	https://www.ccdsupport.com/confluence/

Tot
mt CO_2
0.0

Did the facility have any natural gas c to reporting under 98

Best Availa

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available for

Pneumatic Device

Calculation Method 1 Pneumatic Dev

Calculation Method 2 Pneumatic Dev

Calculation Method 3 Pneumatic Dev

Calculation Method 4 Pneumatic Dev

Missing Data Procedures Used for Pneumatic Device E

Table B.1.i Pneumatic Devices

Type of Pneumatic Device	Total Number of Natural Gas Pneumatic Devices [98.236(b)(2)(i)]
Continuous High Bleed Pneumatic Devices	
Intermittent Bleed Pneumatic Devices	
Continuous Low Bleed Pneumatic Devices	

Table B.1.ii Pneumatic Devices Estimated Counts

Allowed only for Onshore Petroleum and Natural Gas Production and Onshore Petr

Type of Pneumatic Device	Are Any of the Device Counts Provided in Table B.1.i Estimated? (Yes / No) [98.236(b)(2)(viii)]
Continuous High Bleed Pneumatic Devices	
Intermittent Bleed Pneumatic Devices	
Continuous Low Bleed Pneumatic Devices	

Table B.2 Calculation Method 1 Pneumatic Device Vented Emissions

Measurement Location ID Number [98.236(b)(3)(i)]	Flow Monitor Type [98.236(b)(3)(ii)]
[redacted]	

[redacted]

[redacted]

Table B.3 Calculation Method 2 Pneumatic Device Vented Emissions
If reporting for the Onshore Petroleum and Natural Gas Production, or Onshore Pet

Type of Pneumatic Device	Primary Measurement Method Used [98.236(b)(4)(i)(A)] [98.236(b)(4)(ii)(B)]
Continuous High Bleed Pneumatic Devices	[redacted]
Intermittent Bleed Pneumatic Devices	
Continuous Low Bleed Pneumatic Devices	

Table B.4 Calculation Method 3 Pneumatic Device Vented Emissions

Type of Pneumatic Device	To Calculate Emissions, Did You Measure According to 98.233(a)(3)(i)(A) or Use Default Emission Factors According to 98.233(a)(3)(i)(B)? [98.236(b)(5)(i)(A)]
Continuous High Bleed Pneumatic Devices	[redacted]
Intermittent Bleed Pneumatic Devices	
Continuous Low Bleed Pneumatic Devices	

Table B.5 Calculation Method 4 Pneumatic Device Vented Emissions

Type of Pneumatic Device	Estimated Average Number of Hours in the Operating Year that the Pneumatic Devices Were in Service, T_t (hours) [98.236(b)(6)(ii)]
Continuous High Bleed Pneumatic Devices	[redacted]
Intermittent Bleed Pneumatic Devices	
Continuous Low Bleed Pneumatic Devices	

Table B.6.i Missing Data Procedures Used for Pneumatic Device Emission Calculati

Measurement Location ID	Parameters for Calculation Method 1 Emissions [Table B.2]
[redacted]	

Table B.6.ii Missing Data Procedures Used for Pneumatic Device Emission Calculat

Type of Pneumatic Device	Parameters for Calculation Method 2 Emissions [Table B.3]
[redacted]	

[redacted]

Table B.6.iii Missing Data Procedures Used for Pneumatic Device Emission Calcula

Type of Pneumatic Device	Parameters for Calculation Method 3 Emissions [Table B.4]
[redacted]	

Table B.6.iv Missing Data Procedures Used for Pneumatic Device Emission Calcula

Type of Pneumatic Device	Parameters for Calculation Method 4 Emissions [Table B.5]
[redacted]	

#N/A

[Back to Summary Tab]

ral gas pneumatic device venting:

ınder 98.232.

1.

2.

3.

ɛumatic device vented emissions using calculation method 4.

: devices using calculation method 1.

c devices using calculation method 2.

ic devices using calculation method 3.

ic devices using calculation method 4.

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display/help/Subpart+W+-+Petroleum+and+Natural+Gas+Systems

al Emissions for Pneumatic Device Venting [98.236(b)]	
mt CH_4	mt N_2O
0.00	N/A

Applicability	
driven pneumatic devices subject 3.232 [98.236(b)]?	

ıble Monitoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
' NG driven devices	

Pneumatic Devices [Table B.1.i]:	CLICK HERE
∍s Estimated Counts [Table B.1.ii]:	CLICK HERE
ice Vented Emissions [Table B.2]:	CLICK HERE
ice Vented Emissions [Table B.3]:	CLICK HERE
ice Vented Emissions [Table B.4]:	CLICK HERE
ice Vented Emissions [Table B.5]:	CLICK HERE
Emission Calculations [Table B.6]:	CLICK HERE

Total Number Vented Directly to Atmosphere [98.236(b)(2)(ii)]	Total Number Vented Directly to Atmosphere for Which Emissions Were Calculated Using Calculation Method 1 [98.236(b)(2)(iv)]
[redacted]	

oleum and Natural Gas Gathering and Boosting facilities in first or second yea

Specify whether the calendar year is the first calendar year of reporting or the second calendar year of reporting (First / Second) [98.236(b)(2)(viii)(C)]	Total Number, Actual Count [98.236(b)(2)(viii)(A)]
[redacted]	

Number of Continuous High Bleed Natural Gas Pneumatic Devices Downstream of the Flow Monitor [98.236(b)(3)(iii)]	Number of Intermittent Bleed Devices Natural Gas Pneumatic Downstream of the Flow Monitor [98.236(b)(3)(iii)]
[redacted]	

[redacted]

[redacted]

roleum and Natural Gas Gathering and Boosting Industry Segments, additiona

Number of Years Used in Current Measurement Cycle [98.236(b)(4)(ii)(A)]	Were Emissions from Any Natural Gas Pneumatic Devices at this Facility Calculated Using Equation W-1B? [98.236(b)(4)(ii)(C)]
[redacted]	

Primary Measurement Method Used [98.236(b)(5)(i)(B)]	Total Number of Natural Gas Pneumatic Devices that Vent Directly to the Atmosphere and Measured Using Default Factor [98.236(b)(5)(i)(C)(1)]
[redacted]	

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Total CO_2 Emissions Using Calculation Method 4 (mt CO_2) [98.236(b)(6)(iii)]	Total CH_4 Emissions Using Calculation Method 4 (mt CH_4) [98.236(b)(6)(iv)]
[redacted]	

ons Using Method 1

Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]
[redacted]	

ions Using Method 2

Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]
[redacted]	

[redacted]

tions Using Method 3

Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]
[redacted]	[redacted]

tions Using Method 4

Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]
[redacted]	[redacted]

Total Number Vented Directly to Atmosphere for Which Emissions Were Calculated Using Calculation Method 2 [98.236(b)(2)(v)]	Total Number Vented Directly to Atmosphere for Which Emissions Were Calculated Using Calculation Method 3 [98.236(b)(2)(vi)]
[redacted]	

ar of reporting. Complete only if you elect to estimate the count of any type of dev

Total Number, Estimated Count [98.236(b)(2)(viii)(B)]	Total Number Vented Directly to Atmosphere, Actual Count [98.236(b)(2)(ii)] [98.236(b)(2)(viii)(A)]
[redacted]	

Number of Continuous Low Bleed Natural Gas Pneumatic Devices Downstream of the Flow Monitor [98.236(b)(3)(iii)]	Is there a Natural Gas Driven Pneumatic Pump Downstream of the Flow Monitor? [98.236(b)(3)(iv)]
[redacted]	[redacted]

[redacted]

[redacted]

al inputs are required in Columns I through K.

Emissions Factor Calculated Using Equation W-1A (scf/hour/device) [98.236(b)(4)(ii)(D)(1)]	Total Number of Natural Gas Pneumatic Devices Measured Across All Years Upon Which the Emission Factor is Based [98.236(b)(4)(ii)(D)(2)]
[redacted]	

Average Estimated Number of Hours in the Calendar Year that the Pneumatic Devices Were In Service, T_t (hours) [98.236(b)(5)(i)(C)(2)]	Primary Monitoring Method Used [98.236(b)(5)(ii)(A)]
[redacted]	

Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]	
[redacted]	

Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]	
[redacted]	

[redacted]

Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]	
[redacted]	[redacted]

Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]	
[redacted]	[redacted]

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Total Number Vented Directly to Atmosphere for Which Emissions Were Calculated Using Calculation Method 4 [98.236(b)(2)(vii)]
[redacted]

vice.

Total Number Vented Directly to Atmosphere, Estimated Count [98.236(b)(2)(ii)] [98.236(b)(2)(viii)(B)]	Total Number Vented Directly to Atmosphere for Which Emissions Were Calculated Using Calculation Method 1 (Actual Count) [98.236(b)(2)(viii)(A)]
[redacted]	[redacted]

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Total CO_2 Emissions Using Calculation Method 1 ($mt\ CO_2$) [98.236(b)(3)(v)]	Total CH_4 Emissions Using Calculation Method 1 ($mt\ CH_4$) [98.236(b)(3)(vi)]
[redacted]	

[redacted]

[redacted]

Total Number of Natural Gas Pneumatic Devices that Vent Directly to the Atmosphere that Were Not Directly Measured ($Count_t$ in Equation W-1B) [98.236(b)(4)(ii)(D)(3)]	Estimated Average Number of Hours in the Calendar Year that the Pneumatic Devices Were-In Service, T_t (hours) [98.236(b)(4)(i)(B)] [98.236(b)(4)(ii)(D)(4)]
[redacted]	

Number of Complete Monitoring Surveys Conducted [98.236(b)(5)(ii)(A)]	Total Number of Intermittent Bleed Natural Gas Pneumatic Devices Detected as Malfunctioning in Any Pneumatic Device Monitoring Survey During the Calendar Year [98.236(b)(5)(ii)(B)]
[redacted]	

RETURN TO TOP

Procedures used

[98.235(h)]

[redacted]

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Procedures used

[98.235(h)]

[redacted]

[redacted]

RETURN TO TOP

Procedures used

[98.235(h)]

[redacted]

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Procedures used

[98.235(h)]

[redacted]

Total Number Vented Directly to Atmosphere for Which Emissions Were Calculated Using Calculation Method 1 (Estimated Count) [98.236(b)(2)(viii)(B)]	Total Number Vented Directly to Atmosphere for Which Emissions Were Calculated Using Calculation Method 2 (Actual Count) [98.236(b)(2)(viii)(A)]
[redacted]	

Total Measured CO_2 Emissions Using Calculation Method 2 (mt CO_2) [98.236(b)(4)(i)(C)] [98.236(b)(4)(ii)(E)]	Total Measured CH_4 Emissions Using Calculation Method 2 (mt CH_4) [98.236(b)(4)(i)(D)] [98.236(b)(4)(ii)(F)]
[redacted]	

Average Time in the Calendar Year that the Pneumatic Devices Were in Service and Assumed Malfunctioning, Average of $T_{mal,z}$ (hours) [98.236(b)(5)(ii)(C)]	Total Number of Intermittent Bleed Natural Gas Pneumatic Devices NOT Detected as Malfunctioning in Any Pneumatic Device Monitoring Survey During the Calendar Year [98.236(b)(5)(ii)(D)]
[redacted]	

Total Number Vented Directly to Atmosphere for Which Emissions Were Calculated Using Calculation Method 2 (Estimated Count) [98.236(b)(2)(viii)(B)]	Total Number Vented Directly to Atmosphere for Which Emissions Were Calculated Using Calculation Method 3 (Actual Count) [98.236(b)(2)(viii)(A)]
[redacted]	

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Total CO_2 Emissions Using Calculation Method 2 from Devices that Were Not Directly Measured (mt CO_2) [98.236(b)(4)(ii)(G)]	Total CH_4 Emissions Using Calculation Method 2 from Devices that Were Not Directly Measured (mt CH_4) [98.236(b)(4)(ii)(H)]

Average Time in the Calendar Year that the Pneumatic Devices Were in Service and Not Malfunctioning, T_{avg} (hours) [98.236(b)(5)(ii)(E)]	Total CO_2 Emissions Using Calculation Method 3 (mt CO_2) [98.236(b)(5)(iii)]

Total Number Vented Directly to Atmosphere for Which Emissions Were Calculated Using Calculation Method 3 (Estimated Count) [98.236(b)(2)(viii)(B)]	Total Number Vented Directly to Atmosphere for Which Emissions Were Calculated Using Calculation Method 4 (Actual Count) [98.236(b)(2)(viii)(A)]
[redacted]	

RETURN TO TOP

Total CH_4 Emissions Using Calculation Method 3 (mt CH_4) [98.236(b)(5)(iv)]
[redacted]

RETURN TO TOP

Total Number Vented Directly to Atmosphere for Which Emissions Were Calculated Using Calculation Method 4 (Estimated Count) [98.236(b)(2)(viii)(B)]
[redacted]

Natural Gas Driven Pneumatic Pumps [98.236(c)]

Version R.10

Worksheet Instructions:
In accordance with 98.232, only the following industry segments must re
-Onshore petroleum and natural gas production [98.230(a)(2)]
-Onshore petroleum and natural gas gathering and boosting [98.230(a)(9
Table C.1 must be completed by all facilities with NG driven pneumatic p
Table C.2 is required for all NG driven pneumatic pumps that used calcul
Table C.3 is required for all NG driven pneumatic pumps that used calcul
Table C.4 is required for all NG driven pneumatic pumps that used calcul
Table C.5.i is required for the identification of missing data procedures us
Table C.5.ii is required for the identification of missing data procedures u
Table C.5.iii is required for the identification of missing data procedures u

External Links:	
Subpart W Resources Page	https://www.epa.gov/ghgreporting/
Optional Calculation Spreadsheet	https://www.ccdsupport.com/conflu
Help Resources	https://www.ccdsupport.com/conflu

Total Er
mt CO_2
0.0

Did the facility have any natura subject to reporting un
Did the facility use a contin emissions per Calc
Did the facility measure vente calculate emissions using a fa per Calculatio
Did the facility use the default calculate emissions pe

Best Avai

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available f

NG Driven Pneumatic Pumps Count if using Calculatio
NG Driven Pneumatic Pumps C
NG Driven Pneumatic Pumps C
NG Driven Pneumatic Pumps C
Missing Data Procedu
Missing Data Procedur
Missing Data Procedure

Table C.1 NG Driven Pneumatic Pumps Count if using Calculation Methods 1, 2, or 3

Total Count of Natural Gas Driven Pneumatic Pumps [98.236(c)(2)(i)]	Total Number of Natural Gas Driven Pumps Vented Directly to the Atmosphere [98.236(c)(2)(ii)]

Table C.2 NG Driven Pneumatic Pumps Calculation Method 1

Measurement Location ID Number [98.236(c)(3)(i)]	Flow Monitor Type [98.236(c)(3)(ii)]

[redacted]

[redacted]

Table C.3 NG Driven Pneumatic Pumps Calculation Method 2

Number of Years Used in the Current Measurement Cycle [98.236(c)(4)(i)]	Number of Natural Gas Driven Pneumatic Pumps [98.236(c)(4)(ii)]

Table C.4 NG Driven Pneumatic Pumps Calculation Method 3

Number of Pumps that Vent Directly to the Atmosphere, Count [98.236(c)(5)(i)]	Average Estimated Number of Hours the Natural Gas Driven Pumps Vented Directly to the Atmosphere Pumped Liquid [98.236(c)(5)(ii)]

Table C.5.i Missing Data Procedures Used for NG Driven Pneumatic

Measurement Location ID Number for Parameters (For Calculation Method 1 Only)	Parameter for Calculation Method 1 Emissions [Table C.2]

Table C.5.ii Missing Data Procedures Used for NG Driven Pneumatic

Parameter for Calculation Method 2 Emissions [Table C.3]	Measurement Frequency
[redacted]	

Table C.5.iii Missing Data Procedures Used for NG Driven Pneumati

Parameter for Calculation Method 3 Emissions [Table C.4]	Measurement Frequency
[redacted]	

#N/A

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port data for natural gas driven pneumatic pumps:

))]

umps subject to reporting under 98.232.

lation method 1 to calculate emissions.

lation method 2 to calculate emissions.

lation method 3 to calculate emissions.

sed for NG driven pneumatic pumps that used calculation method 1.

sed for NG driven pneumatic pumps that used calculation method 2.

ised for NG driven pneumatic pumps that used calculation method 3.

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uence/display/help/Subpart+W+-+Petroleum+and+Natural+Gas+Systems

nissions for Natural Gas Driven Pneumatic Pumps [98.236(c)]	
mt CH_4	mt N_2O
0.00	N/A

Applicability	
l gas driven pneumatic pumps der 98.232 [98.236(c)]?	
uous flow meter to measure culation Method 1?	
d emissions and, if applicable, acility-specific emission factor on Method 2?	
population emission factor to r Calculation Method 3?	

lable Monitoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
for NG driven pumps	

n Methods 1, 2, or 3 [Table C.1]:	CLICK HERE
alculation Method 1 [Table C.2]:	CLICK HERE
alculation Method 2 [Table C.3]:	CLICK HERE
alculation Method 3 [Table C.4]:	CLICK HERE
res Using Method 1 [Table C.5i]:	CLICK HERE
es Using Method 2 [Table C.5ii]:	CLICK HERE
es Using Method 3 [Table C.5iii]:	CLICK HERE

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Number of Natural Gas Driven Pneumatic Pumps Downstream of Flow Monitor [98.236(c)(3)(iii)]	Are Any Natural Gas Driven Pneumatic Devices Downstream of the Flow Monitor? [98.236(c)(3)(iv)]
[redacted]	

[redacted]

[redacted]

Were All Emissions from Pneumatic Pumps Measured During the Reporting Year or Were Some Measured and Some Calculated Using Equation W-2B? [98.236(c)(4)(iii)]	Primary Measurement Method [98.236(c)(4)(iv)]
[redacted]	

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Annual CO_2 Emissions Using Calculation Method 3 (mt CO_2) [98.236(c)(5)(iii)]	Annual CH_4 Emissions Using Calculation Method 3 (mt CH_4) [98.236(c)(5)(iv)]
[redacted]	

Pumps Emission Calculations Using Method 1

Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]
[redacted]	

c Pumps Emission Calculations Using Method 2

Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]
[redacted]	

c Pumps Emission Calculations Using Method 3

Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]
[redacted]	

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Annual CO_2 Emissions Using Calculation Method 1 ($mt\ CO_2$) [98.236(c)(3)(v)]	Annual CH_4 Emissions Using Calculation Method 1 ($mt\ CH_4$) [98.236(c)(3)(vi)]
[redacted]	

[redacted]

[redacted]

Emission Factor for the Reporting Year from Equation W-2A (scf/hr/pump) [98.236(c)(4)(v)(A)]	Total Number of Pumps Across All Years Upon Which the Emission Factor is Based, $Count_y$ [98.236(c)(4)(v)(B)]
[redacted]	[redacted]

Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]		
[redacted]	[redacted]	[redacted]

Procedures Used [98.235(h)]
[redacted]

Procedures Used [98.235(h)]
[redacted]

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Total Number of Pumps that Vent Directly to the Atmosphere and Were Not Directly Measured According to 98.233(c)(1) or 98.233(c)(2)(iii), Count [98.236(c)(4)(v)(C)]	Average Estimated Number of Hours the Pumps Were Pumping Liquid, T [98.236(c)(4)(v)(D)]
[redacted]	[redacted]

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Procedures Used [98.235(h)]
[redacted]

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[redacted]

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[redacted]

Annual CO_2 Emissions Which Were Directly Measured and Calculated as Specified in §98.233(c)(2)(ii) through (vi) (mt CO_2) [98.236(c)(4)(vi)]	Annual CH_4 Emissions Which Were Directly Measured and Calculated as Specified in §98.233(c)(2)(ii) through (vi) (mt CH_4) [98.236(c)(4)(vii)]	Annual CO2 Emissions Using Equation W-2B (Emissions Which Were Not Measured) (mt CO2) [98.236(c)(4)(viii)]

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Annual CH4 Emissions Using Equation W-2B (Emission Which Were Not Measured) (mt CH4) [98.236(c)(4)(ix)]

Acid Gas Removal Units [98.236(d)]

Version   R.10

Worksheet Instructions:
In accordance with 98.232, only the following industry segments must report data for aci
-Onshore petroleum and natural gas production [98.230(a)(2)]
-Onshore natural gas processing [98.230(a)(3)]
-Onshore petroleum and natural gas gathering and boosting [98.230(a)(9)]
Table D.1 must be completed by all facilities with acid gas removal units subject to repor
Table D.2 is required for emissions determined using Calculation Method 1.
Table D.3 is required for emissions determined using Calculation Method 2.
Table D.4 is required for emissions determined using Calculation Method 3.
Table D.5 is required for emissions determined using Calculation Method 4.
Table D.6 is required for the identification of missing data procedures used for acid gas r

External Links:	
Subpart W Resources Page	https://www.epa.gov/ghgreporting/subpart-w-petrol
Optional Calculation Spreadsheet	https://www.ccdsupport.com/confluence/display/he
Help Resources	https://www.ccdsupport.com/confluence/display/he

Total Emis
mt CO_2
0.0

Did the facility have any acid gas remova atmosphere, to a flare or engine, or to a sulfur under 98.232 [98.2

Best Available Mon

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available for Acid (

For Acid gas removal
For Calcula
For Calcula
For Calcula
For Calcula
For

Table D.1 Acid gas removal unit specific information

Acid gas removal unit reporting is on a unit basis, not a vent basis. If your AGR unit has data from multiple vents as needed in Tables D.2 through D.6.

	Required only for Onshore Petroleum and Natural Gas Production
Unit ID or Name **[98.236(d)(1)(i)]**	**Sub-Basin ID** **[98.236(d)(1)(vi)]**

Table D.2 Calculation Method 1 emissions

WARNING: Data must be entered in sequential rows. e-GGRT will not process records

Unit ID or Name **[98.236(d)(1)(i)]**	**Annual average fraction of CO_2 content in the vent from the acid gas removal unit (volumetric fraction)** **[98.236(d)(2)(i)(A)]**

Table D.3 Calculation Method 2 emissions

WARNING: Data must be entered in sequential rows. e-GGRT will not process records

Unit ID or Name [98.236(d)(1)(i)]	Annual average fraction of CO_2 content in the vent from the acid gas removal unit, Vol_{CO2} (volumetric fraction) [98.236(d)(2)(i)(A)]

Table D.4 Calculation Method 3 emissions

WARNING: Data must be entered in sequential rows. e-GGRT will not process records

Unit ID or Name [98.236(d)(1)(i)]	Equation Used (W-4A/W-4B) [98.236(d)(2)(ii)(A)]

Table D.5 Calculation Method 4 Emissions

WARNING: Data must be entered in sequential rows. e-GGRT will not process records

Unit ID or Name [98.236(d)(1)(i)]	Name of simulation software package used [98.236(d)(2)(iii)(A)]

Table D.6 Missing data procedures used for Acid Gas Removal emission calculati

Unit ID or Name [98.236(d)(1)(i)]	Calculation Method 1 Emissions [Table D.2]

[redacted]

#N/A

Back to Summary Tab

id gas removal units:

rting under 98.232.

removal unit emission calculations.

eum-and-natural-gas-systems

lp/Optional+Calculation+Spreadsheet+Instructions

lp/Subpart+W+-+Petroleum+and+Natural+Gas+Systems

ssions for Acid Gas Removal Units [98.236(d)]	
mt CH_4	mt N_2O
N/A	N/A

Applicability	
l units that vent directly to the r recovery plant subject to reporting 36(d)]?	

nitoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
Gas Removal Units	

unit specific information [Table D.1]:	CLICK HERE
ıtion Method 1 emissions [Table D.2]:	CLICK HERE
ıtion Method 2 emissions [Table D.3]:	CLICK HERE
ıtion Method 3 emissions [Table D.4]:	CLICK HERE
ıtion Method 4 emissions [Table D.5]:	CLICK HERE
Missing data procedures [Table D.6]:	CLICK HERE

multiple vents, enter the unit ID, not the vent IDs in Table D.1 and aggregate

Required only for Onshore Petroleum and Natural Gas Gathering and Boosting	
County and State **[98.236(d)(1)(vi)]**	**Total feed rate entering the acid gas removal unit for the year (million cubic feet)** **[98.236(d)(1)(ii)]**

RETURN TO TOP

ı after an empty row.

Annual volume of gas vented from the acid gas removal unit (standard cubic feet) **[98.236(d)(2)(i)(B)]**

RETURN TO TOP

; after an empty row.

Annual volume of gas vented from the acid gas removal unit, V_s (actual or standard cubic feet) [98.236(d)(2)(i)(B)]	Annual volume of gas vented reported on an actual or standard basis? [98.236]

RETURN TO TOP

; after an empty row.

Annual average fraction of CO_2 content of natural gas into the acid gas removal unit, Vol_i (volumetric fraction) [98.236(d)(2)(ii)(C)]	Annual average fraction of CO_2 content of natural gas out of the acid gas removal unit, Vol_o (volumetric fraction) [98.236(d)(2)(ii)(B)]

RETURN TO TOP

; after an empty row.

Natural gas feed temperature (ºF) [98.236(d)(2)(iii)(B)]	Natural gas feed pressure (psi) [98.236(d)(2)(iii)(C)]

ons

Parameters (specify only one per row)	
Calculation Method 2 Emissions **[Table D.3]**	**Calculation Method 3 Emissions*** **[Table D.4]**
[redacted]	

Calculation Method Used (Select from list) [98.236(d)(1)(iii)]	Are any CO_2 emissions from the acid gas removal unit recovered and transferred outside the facility? (Yes / No) [98.236(d)(1)(iv)]

Temperature used to calculate volume of gas vented (^{o}F) [98.236]	Pressure used to calculate volume of gas vented (psi) [98.236]

Natural gas flow rate into the acid gas removal unit, V_{in} (actual or standard cubic feet) (Eq. W-4A) [98.236(d)(2)(ii)(D)]	Natural gas flow rate out of the acid gas removal unit, V_{out} (actual or standard cubic feet) (Eq. W-4B) [98.236(d)(2)(ii)(D)]

Natural gas feed flow rate (standard cubic feet per minute) [98.236(d)(2)(iii)(D)]	Acid gas content of feed natural gas (mole percent) [98.236(d)(2)(iii)(E)]

Calculation Method 4 Emissions [Table D.5]	Measurement Frequency
[redacted]	

11/22/2024

Total CO_2 Emissions (mt CO_2) [98.236(d)(1)(v)]

Natural gas flow rate reported on an actual or standard basis? [98.236]	Temperature used to calculate natural gas flow rate (^{o}F) [98.236]

Acid gas content of outlet natural gas (mole percent) [98.236(d)(2)(iii)(F)]	Unit operating hours (excluding downtime for maintenance or standby) [98.236(d)(2)(iii)(G)]

RETURN TO TOP

Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]
[redacted]	

Pressure used to calculate natural gas flow rate (psi) [98.236]

Exit temperature of the natural gas (°F) [98.236(d)(2)(iii)(H)]	Solvent pressure (psi) [98.236(d)(2)(iii)(I)]

Procedures used [98.235(h)]
[redacted]

Solvent temperature (°F) [98.236(d)(2)(iii)(J)]	Solvent circulation rate (gallons per minute) [98.236(d)(2)(iii)(K)]	Solvent weight (pounds per gallon) [98.236(d)(2)(iii)(L)]

Is a vent meter installed? [98.236(d)(2)(iii)(M)]	Total Annual Volume of Vent Gas Flowing Out of the AGR as Determined by Flow Meter, $V_{a,meter}$ (cubic feet per year at actual conditions) [98.236(d)(2)(iii)(M)(1)]

Total Annual Volume of Vent Gas Flowing Out of the AGR as Determined by the Standard Simulation Software Package, $V_{a,sim}$ (cubic feet per year at actual conditions) [98.236(d)(2)(iii)(M)(2)]
[redacted]

Description of the reason for more than 20% difference. If you do not have more than a 20% difference, please leave the description field blank. [98.236(d)(2)(iii)(M)(3)] [98.236(d)(2)(iii)(M)(2)]
[redacted]

Dehydrators [98.236(e)]

Version R.10

Worksheet Instructions:
In accordance with 98.232, only the following industry segments must report data
-Onshore petroleum and natural gas production [98.230(a)(2)]
-Onshore natural gas processing [98.230(a)(3)]
-Onshore petroleum and natural gas gathering and boosting [98.230(a)(9)]
Table E.1 must be completed by all facilities with small glycol dehydrators (<0.4 M
Table E.2 must be completed by all facilities with desiccant dehydrators subject tc
Table E.3 must be completed by all facilities with large glycol dehydrators (>=0.4 dehydrators (<0.4 MMscfd).
Table E.4 is required for the identification of missing data procedures used for del

External Links:	
Subpart W Resources Page	https://www.epa.gov/ghgrepo
Optional Calculation Spreadsheet	https://www.ccdsupport.com/
Help Resources	https://www.ccdsupport.com/

mt CO_2
0.0

Did the facility have any annual average daily natura 0.4MMscfd subject to [98.236(e)] and that are us
Did the facility have any de to reporting under
Did the facility have any annual average daily natur than or equal to 0.4MMscfc 98.232 [98.236(e)], or did t dehydrators with annual throughputs less than 0.4 Meth

Best Available

Were BAMM used for any parameters to calculate
BAMM not availab

For Small Glycol Dehydrators Using Calcu
For Desicc
For Glycol Dehydrators Using Calcu
For Missing I

Table E.1 Small Glycol Dehydrators Using Calculation Method 2 [98.233(e)(2

If the facility has any glycol dehydrators with a throughput <0.4 MMscfd (i.e.

Total Number of Small Glycol Dehydrators Using Calculation Method 2 [98.236(e)(2)(i)]	

Type of Device	**Vent Controls Used (select all that apply) [98.236(e)(2)(ii)] [98.236(e)(2)(iii)] [98.236(e)(2)(iv)]**
Vapor Recovery	
Dehydrator vents to flares or regenerator firebox/fire tubes	
Control devices other than vapor recovery, flare or regenerator firebox/fire tubes	

Control devices other than vapor recovery, flare or regenerator firebox/fire tubes	**Specify Type of Other Control Device(s) [98.236(e)(2)(iii)]**

Type of Emission Point	Total CO_2 Emissions (mt CO_2) [98.236(e)(2)(iv)(B)] [98.236(e)(2)(v)(A)]
Emissions vented to flare or regenerator firebox/fire tubes	
Emissions that were not vented to a flare or regenerator firebox/fire tubes	

Table E.2 Desiccant Dehydrators

If the facility has any desiccant dehydrators, complete following tables:

Total Number of Desiccant Dehydrators [98.236(e)(3)(i)]	

Type of Device	Vent Controls Used (select all that apply) [98.236(e)(3)(i)]
Vapor Recovery	
Dehydrator vents to flares or regenerator firebox/fire tubes	
Control devices other than vapor recovery, flare or regenerator firebox/fire tubes	

	Specify Type of Other Control Device(s) [98.236(e)(2)(iii)]
Control devices other than vapor recovery, flare or regenerator firebox/fire tubes	

Type of Emission Point	Total CO_2 Emissions (mt CO_2) [98.236(e)(3)(i)] [98.236(e)(3)(ii)]
Emissions vented to flare or regenerator firebox/fire tubes	
Emissions that were not vented to a flare or regenerator firebox/fire tubes	

Table E.3 Glycol Dehydrators Using Calculation Method 1

	Required only for Onshore Petroleum and Natural Gas Production
Unit ID or Name **[98.236(e)(1)(i)]**	**Sub-Basin ID** **[98.236(e)(1)(xviii]**

[redacted]

[redacted]

Table E.4 Missing data procedures used for Dehydrator emission calculatio

Type of Dehydrator	Unit ID (Calculation Method 1 Dehydrators Only)
[redacted]	

#N/A

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for dehydrators:

lMscfd) subject to reporting under 98.232 and electing to use Ca

› reporting under 98.232.

MMscfd) subject to reporting under 98.232 and facilities electing

hydrator emission calculations.

ırting/subpart-w-petroleum-and-natural-gas-systems
confluence/display/help/Optional+Calculation+Spreadsheet+Instr
confluence/display/help/Subpart+W+-+Petroleum+and+Natural+(

Total Emissions for Dehydrators [98.236(e)]	
mt CH_4	mt N_2O
0.00	0.000

Applicability	
ı glycol dehydrators with al gas throughputs less than reporting under 98.232 sing Calculation Method 2?	
esiccant dehydrators subject ' 98.232 [98.236(e)]?	
ı glycol dehydrators with ral gas throughputs greater d subject to reporting under the facility have any glycol average daily natural gas 4MMscfd using Calculation ıod 1?	

Monitoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
ble for Dehydrators	

ulation Method 2 [Table E.1]:	CLICK HERE
:ant Dehydrators [Table E.2]:	CLICK HERE
ulation Method 1 [Table E.3]:	CLICK HERE
Data Procedures [Table E.4]:	CLICK HERE

:)]

., "small" dehydrators) and is using Calculation Method 2, cc

Number of Small Glycol Dehydrators Using Calculation Method 2 By Vent Control Type, Count [98.236(e)(2)(ii)] [98.236(e)(2)(iv)(A)]

Number of Small Glycol Dehydrators Using Calculation Method 2 By Other Vent Control Type [98.236(e)(2)(iii)]

[redacted]

Total CH_4 Emissions (mt CH_4) [98.236(e)(2)(iv)(C)] [98.236(e)(2)(v)(B)]	Total N_2O Emissions (mt N_2O) [98.236(e)(2)(iv)(D)]

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Number of Desiccant Dehydrators By Vent Control Type, Count [98.236(e)(3)(i)]

Number of Desiccant Dehydrators By Other Vent Control Type [98.236(e)(2)(iii)]
[redacted]

Total CH_4 Emissions (mt CH_4) [98.236(e)(3)(i)] [98.236(e)(3)(iii)]	Total N_2O Emissions (mt N_2O) [98.236(e)(3)(i)]

RETURN TO TOP

Required only for Onshore Petroleum and Natural Gas Gathering and Boosting	
County and State [98.236(e)(1)(xviii)]	Glycol dehydrator feed natural gas flow rate determined by engineering estimate based on best available data (MMscfd) [98.236(e)(1)(ii)]

[redacted]

[redacted]

[redacted]

[redacted]

ns

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Parameters	Measurement Frequency
[redacted]	

lculation Method 2.

to use Calculation Method 1 for small glycol

ructions
Gas+Systems

ɔmplete following tables:

Dehydrator feed natural gas water content (pounds per MMscf) [98.236(e)(1)(iii)]	Dehydrator outlet natural gas water content (pounds per MMscf) [98.236(e)(1)(iv)]

Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]
[redacted]	

11/22/2024

Glycol dehydrator absorbent circulation pump type [98.236(e)(1)(v)]	Dehydrator absorbent circulation rate (gallons per minute) [98.236(e)(1)(vi)]	Report type of absorbent used [98.236(e)(1)(vii)]

Procedures used [98.235(h)]
[redacted]

Report whether stripper gas is used in glycol dehydrator [98.236(e)(1)(viii)]	Report whether a flash tank separator is used in glycol dehydrator [98.236(e)(1)(ix)]	Total time the glycol dehydrator is operating (hours) [98.236(e)(1)(x)]

Temperature of the wet natural gas (°F) [98.236(e)(1)(xi)]	Pressure of the wet natural gas (psig) [98.236(e)(1)(xii)]	Concentration of CO_2 in wet natural gas (mole fraction) [98.236(e)(1)(xiv)]	Concentration of CH_4 in wet natural gas (mole fraction) [98.236(e)(1)(xiii)]

		Complete only If emissior
Were any dehydrator emissions vented to a vapor recovery device? [98.236(e)(1)(xv)]	Were any dehydrator emissions vented to a flare or regenerator firebox/fire tubes? [98.236(e)(1)(xvi)]	CO_2 Emissions from Flares or Regenerators (mt CO_2) [98.236(e)(1)(xvi)(A)]

ns are vented to a flare or regenerator firebox/fire tubes		
CH_4 Emissions from Flares or Regenerators (mt CH_4) [98.236(e)(1)(xvi)(B)]	N_2O Emissions from Flares or Regenerators (mt N_2O) [98.236(e)(1)(xvi)(C)]	Were any dehydrator emissions vented to the atmosphere without being routed to a flare or regenerator firebox/fire tubes? [98.236(e)(1)(xvii)]

Complete only if emissions are vented to the atmosphere without being routed to a flare or regenerator firebox/fire tubes	
CO_2 Emissions from Venting ($mt\ CO_2$) [98.236(e)(1)(xvii)(A)]	CH_4 Emissions from Venting ($mt\ CH_4$) [98.236(e)(1)(xvii)(B)]

Well Venting for Liquids Unloading [98.236(f)]

Version

Worksheet Instructions:	
In accordance with 98.232, only the following industry segment must report data for well venting	
-Onshore petroleum and natural gas production [98.230(a)(2)]	
For Sub-basins using Calculation Method 1, complete Table F.1. When Calculation Methods 2 o missing data procedures used for well venting emission calculations. Well-specific information re of Table AA.1.iii). In addition, data describing wells tested under 98.236(f)(1)(xi) and (xii) must als	

External Links:	
Subpart W Resources Page	https://www.epa.gov/ghgreporting/subpart-
Optional Calculation Spreadsheet	https://www.ccdsupport.com/confluence/di
Help Resources	https://www.ccdsupport.com/confluence/di

Total Emissions fo
mt CO_2
0.0

Did the facility have any well venting fo to reporting under 98.23
Was Calculation Method 1 used to calc (1)]?
Was Calculation Method 2 used to calc (2)]?
Was Calculation Method 3 used to calc (3)]?

Best Available Monito

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available for Liq

For Sub-basins using Calculation Method 1 (Counts, ti
For Sub-basins using Calculation Method 2 or 3 (with or witho
For Missing D
For well-specific reporting re

Table F.1 Calculation Method 1 (counts, time, emissions)

For Sub-basins using Calculation Method 1, complete Table F.1.
(Note: well-specific information for wells with liquids unloading must be reported in Table

Sub-Basin ID [98.236(f)(1)(i)]	Tubing Diameter Group/Pr [98.236(f)(1)(ii

Table F.2 Calculation Method 2 & 3 (with or without plunger lifts)

For Sub-basins using Calculation Method 2 (without plunger lifts) and Calculation Method
(Note: well-specific information for wells with liquids unloading must be reported in Table

Sub-Basin ID [98.236(f)(2)(i)]	Calculation Method [98.236(f)(2)(ii)]

Table F.3 Missing data procedures used for Liquids Unloading emission calculations

Sub-Basin ID [98.236(f)(1)(i)]	Tubing Diameter Group/Pressure Grou [98.236(f)(1)(ii
[redacted]	

#N/A

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for liquids unloading:

r 3 are used, Table F.2 must be completed. Table F.3 is required for the identification of
elated to all wells with liquids unloading must be reported in Table AA.1.iii (see columns J-M
so be entered in Table AA.1.iii (see Columns N-S).

-w-petroleum-and-natural-gas-systems
isplay/help/Optional+Calculation+Spreadsheet+Instructions
isplay/help/Subpart+W+-+Petroleum+and+Natural+Gas+Systems

r Well Venting for Liquids Unloading [98.236(f)]	
mt CH_4	**mt N_2O**
0.00	N/A

Applicability	
or liquids unloading subject 2 [98.236(f)]?	
culate emissions [98.233(f)	
culate emissions [98.233(f)	
culate emissions [98.233(f)	

ring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
uids Unloading	

ime, emissions) [Table F.1]:	CLICK HERE
ut plunger lifts) [Table F.2]:	CLICK HERE
ata Procedures [Table F.3]:	CLICK HERE
quirements [Table AA.1.iii]:	CLICK HERE

AA.1.iii)

ressure Group i)]	Were Plunger Lifts used? [98.236(f)(1)(iii)]	Number of Wells vented for liquids unloading, h [98.236(f)(1)(iv)]

RETURN TO TOP

3 (with plunger lifts), complete following table:
AA.1.iii.)

Were Plunger Lifts used? [98.236(f)(2)(iii)]	Number of wells vented for liquids unloading, W [98.236(f)(2)(iv)]	Cumulative number of unloadings vented to the atmosphere, V_p [98.236(f)(2)(v)]

	Parameters (specify only one per row)	
up for Calculation Method 1 i)]	Calculation Method 1 (counts, time, emissions) [Table F.1]	Calculation Method 2 & 3 (With and without plunger lifts) [Table F.2]

[redacted]

11/22/2024

Percentage of wells for which the monitoring period used to determine the cumulative amount of time venting was not the full calendar year [98.236(f)(1)(v)]	Cumulative amount of time wells were vented, Sum of T_p Values (hours) [98.236(f)(1)(vi)]	Cumulative Number of Unloadings Vented [98.236(f)(1)(vii)]

Annual natural gas emissions from well venting for liquids unloading (standard cubic feet) [98.236(f)(2)(vi)]	Total CO_2 Emissions (mt CO_2) [98.236(f)(2)(vii)]	Total CH_4 Emissions (mt CH_4) [98.236(f)(2)(viii)]

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Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]

[redacted]

Annual natural gas emissions from well venting for liquids unloading (standard cubic feet) [98.236(f)(1)(viii)]	Total CO_2 Emissions (mt CO_2) [98.236(f)(1)(ix)]	Total CH_4 Emissions (mt CH_4) [98.236(f)(1)(x)]

Average internal casing diameter, CD_p (inches) (Calc. Method 2) [98.236(f)(2)(ix)]	Average internal tubing diameter, TD_p (inches) (Calc. Method 3) [98.236(f)(2)(x)]

Procedures used

[98.235(h)]

[redacted]

Completions and Workovers with Hydraulic Fracturing [98.23

Version R.10

Worksheet Instructions:
In accordance with 98.232, only the following industry segment must report data for -Onshore petroleum and natural gas production [98.230(a)(2)]
Table G.1 must be completed for well completions with hydraulic fracturing. Table G.2 must be completed for well workovers with hydraulic fracturing. Table G.3 is required for the identification of missing data procedures used for well c Table G.4 should be completed if data reporting were delayed two years prior to the Table AA.1.iii must be completed for each well subject to reporting under 98.236(g)
NOTE: Reporting is required for well completions WITH hydraulic fracturing (as app

External Links:	
Subpart W Resources Page	https://www.epa.gov/ghgreport
Optional Calculation Spreadsheet	https://www.ccdsupport.com/c
Help Resources	https://www.ccdsupport.com/c
Optional delayed reporting requirements for wildcat wells and delineation wells	https://www.ccdsupport.com/c
Oil and Gas Well Completions and Workovers with Hydraulic Fracturing Help Page:	https://www.ccdsupport.com/c

Total Emissions for Well C
mt CO_2
0.0

Did the facility have any gas workovers *with* hydraul reporting under 98

Best Available Mo

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available for

For
Fo

Delayed Well Completions and Workovers with Hydraulic Fracturin
Fo

Table G.1 Well Completions with Hydraulic Fracturing
Complete the following table for well completions *with* hydraulic fracturing:

Sub-Basin ID [98.236(g)(1)]	Well Type [98.236(g)(2)]

Table G.2 Well Workovers with Hydraulic Fracturing

Complete the following table for well workovers *with* hydraulic fracturing:

Sub-Basin ID [98.236(g)(1)]	Well Type [98.236(g)(2)]

Table G.3 Missing data procedures used for Well Completion and Workover er

Sub-Basin ID [98.236(g)(1)]	Well Type [98.236(g)(2)]
[redacted]	

[redacted]

Table G.4 Delayed Well Completions and Workovers with Hydraulic Fracturing

Sub-Basin ID	Completion or Workover

[redacted]

6(g)] #N/A

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well completions and workovers:

completion and workover emission calculations.

current reporting year due to reliance solely on wildcat or delineation well properties.

(see columns T:AE).

plicable) . Use the navigation links below to move between the tables.

ing/subpart-w-petroleum-and-natural-gas-systems

onfluence/display/help/Optional+Calculation+Spreadsheet+Instructions

onfluence/display/help/Subpart+W+-+Petroleum+and+Natural+Gas+Systems

onfluence/pages/viewpage.action?pageId=267583519

onfluence/display/help/Oil+and+Gas+Well+Completions+and+Workovers+with+Hydraulic+F

ompletions and Workovers with Hydraulic Fracturing [98.236(g)]	
mt CH_4	mt N_2O
0.00	0.000

Applicability	
s or oil well completions or ic fracturing subject to 3.232 [98.236(g)]?	

nitoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
' Wells with Fracturing	

well completions *with* hydraulic fracturing [Table G.1]:	CLICK HERE
›r well workovers *with* hydraulic fracturing [Table G.2]:	CLICK HERE
For Missing data procedures [Table G.3]:	CLICK HERE
g data (for delays claimed two years prior) [Table G.4]:	CLICK HERE
›r well-specific reporting requirements [Table AA.1.iii]:	CLICK HERE

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Well Type Combination		
Is gas flared? [98.236(g)(2)]	Reduced Emission Completions? [98.236(g)(2)]	Oil or Gas Well [98.236(g)(2)]

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Well Type Combination		
Is gas flared? [98.236(g)(2)]	Reduced Emission Workovers? [98.236(g)(2)]	Oil or Gas Well [98.236(g)(2)]

nission calculations

Well Type Combination		
Is gas flared? [98.236(g)(2)]	Reduced Emission Completions or Workovers [98.236(g)(2)]	Oil or Gas? [98.236(g)(2)]

[redacted]

for data (for delays claimed two years prior)

Well Type [98.236(g)(2)]	Was Gas Flared? [98.236(g)(2)]	Reduced Emission Completion/Workover? [98.236(g)(2)]
[redacted]	[redacted]	[redacted]

11/22/2024

Total count of completions in the calendar year, W [98.236(g)(3)]	Equation Used (Select) [98.236(g)(4)]	Are the only wells in the sub-basin used to calculate "cumulative gas flowback time" wildcat or delineation wells subject to a 2-year delay in reporting? [98.236(g)(5)(i)] [98.236(g)(5)(ii)]

[redacted]

Total count of workovers [98.236(g)(3)]	Equation Used (Select) [98.236(g)(4)]	Are the only wells in the sub-basin used to calculate "cumulative gas flowback time" wildcat or delineation wells subject to a 2-year delay in reporting? [98.236(g)(5)(i)] [98.236(g)(5)(ii)]

RETURN TO TOP

		Parameters (specif
Completion or Workover?	Equation used (Select)	Well Completions with Hydraulic Fracturing [Table G.1]

Equation W-10A -- Cumulative flowback time from all wells during completions/workovers from when gas is first detected until sufficient quantities are present to enable separation, Sum of Tp,i values (hours) [98.236(g)(5)(i)]	Equation W-10A -- Cumulative flowback time from all wells during completions/workovers after sufficient quantities are present to enable separation, Sum of Tp,s values (hours) [98.236(g)(5)(i)]	Equation W-10A -- Flowback rate for the measured well(s) during completions/workovers (standard cubic feet per hour) [98.236(g)(5)(ii)]

When using Equation W-10A		
Cumulative gas flowback time from all wells during completions from when gas is first detected until sufficient quantities are present to enable separation, Sum of $T_{p,i}$ values (hours) [98.236(g)(5)(i)]	Cumulative gas flowback time from all wells during completions after sufficient quantities of gas are present to enable separation, Sum of $T_{p,s}$ values (hours) [98.236(g)(5)(i)]	Was the flow rate during the initial flowback period determined using a multiphase flowmeter upstream of a separator for any measured well in the sub-basin? [98.236(g)(5)(iv)]

[redacted]

[redacted]

[redacted]

When using Equation W-10A		
Cumulative gas flowback time from all wells during workovers from when gas is first detected until sufficient quantities are present to enable separation, Sum of $T_{p,i}$ values (hours) [98.236(g)(5)(i)]	Cumulative gas flowback time from all wells during workovers after sufficient quantities of gas are present to enable separation, Sum of $T_{p,s}$ values (hours) [98.236(g)(5)(i)]	Was the flow rate during the initial flowback period determined using a multiphase flowmeter upstream of a separator for any measured well in the sub-basin? [98.236(g)(5)(iv)]
[redacted]		

[redacted]

[redacted]

[redacted]

y only one per row)		
Well Workovers with Hydraulic Fracturing [Table G.2]	Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]
[redacted]	[redacted]	[redacted]

[redacted]

RETURN TO TOP

Well ID Number(s) [98.236(g)(5)(i) and (ii)]
[redacted]

If a multiphase flowmeter was used to measure the flow rate during the initial flowback period, the average flow rate for all wells in the sub-basin measured by the multiphase flow meter from the initiation of flowback to the beginning of the period of time when sufficient quantities of gas present to enable separation, $FR_{p,i}$ (standard cubic feet per hour) [98.236(g)(6)(iii)]	Annual gas emissions, $E_{s,n}$ (standard cubic feet) [98.236(g)(7)]

[redacted]

[redacted]

If a multiphase flowmeter was used to measure the flow rate during the initial flowback period, the average flow rate for all wells in the sub-basin measured by the multiphase flow meter from the initiation of flowback to the beginning of the period of time when sufficient quantities of gas present to enable separation, $FR_{p,i}$ (standard cubic feet per hour) [98.236(g)(6)(iii)]	Annual gas emissions, $E_{s,n}$ (standard cubic feet) [98.236(g)(7)]

[redacted]

[redacted]

[redacted]	

Total number of hours in the year missing data procedure was used **[98.3(c)(8)]** **[98.236(bb)(2)]**		
[redacted]	[redacted]	[redacted]

[redacted]

Annual total CO_2 emissions (mt CO_2) [98.236(g)(8)]	Annual total CH_4 emissions (mt CH_4) [98.236(g)(9)]	Annual total N_2O emissions (mt N_2O) [98.236(g)(10)]

Annual Total CO_2 emissions (mt CO_2) [98.236(g)(8)]	Annual Total CH_4 emissions (mt CH_4) [98.236(g)(9)]	Annual Total N_2O emissions (mt N_2O) [98.236(g)(10)]

Procedures used

[98.235(h)]

[redacted]

[redacted]

Gas Well Completions and Workovers without Hydraulic

Version R.10

Worksheet Instructions:
In accordance with 98.232, only the following industry segment must report c -Onshore petroleum and natural gas production [98.230(a)(2)]
For gas well completions without hydraulic fracturing and without flaring, Tab
For gas well completions without hydraulic fracturing and with flaring, Table H
For gas well workovers without hydraulic fracturing, Table H.3 must be comp
Table AA.1.iii must be completed for each well subject to reporting under 98.
Table H.4 is required for the identification of missing data procedures used fo
Table H.5 should be completed if data reporting were delayed two years prio

NOTE: Reporting is required for gas well completions WITHOUT hydraulic fr

External Links:	
Subpart W Resources Page	https://www.epa.gov/ghgrepo
Optional Calculation Spreadsheet	https://www.ccdsupport.com/
Help Resources	https://www.ccdsupport.com/
Optional delayed reporting requirements for wildcat wells and delineation wells	https://www.ccdsupport.com/
Gas Well Completions without Hydraulic Fracturing Help Page:	https://www.ccdsupport.com/

Total Emissions for Gas
mt CO_2
0.0

Did the facility have any workovers *without* hydra reporting under 9

Best Available M

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available for

For gas well completions *w*

For gas well completion

For gas w

Delayed Gas Well Completions and Workovers without Hydraulic Fracturin

F

Table H.1 Gas well completions WITHOUT hydraulic fracturing (without
Complete the following table for gas well completions that vented direc

Sub-Basin ID [98.236(h)(1)(i)]	Total count of completions that vented directly to atmosphere without flaring [98.236(h)(1)(ii)]

Table H.2 Gas well completions WITHOUT hydraulic fracturing (with fla
Complete the following table for gas well completions with flaring *witho*

Sub-Basin ID [98.236(h)(2)(i)]	Total count of completions that flared gas [98.236(h)(2)(ii)]

Table H.3 Gas well workovers WITHOUT hydraulic fracturing
Complete the following table for gas well workovers *without* hydraulic f

Sub-Basin ID [98.236(h)(3)(i)] [98.236(h)(4)(i)]	Did the facility have gas well workovers without flaring within each sub-basin category? [98.236(h)(3)] [98.236(h)(4)]

Table H.4 Missing data procedures used for Gas Well Completion and W

Sub-Basin ID [98.236(h)]	Completion or Workover?
[redacted]	

[redacted]

Table H.5 Delayed Gas Well Completions and Workovers without Hydra

Sub-Basin ID	Average daily gas production rate for gas well completions without hydraulic fracturing and without flaring (Avg of all V_p, Eq. W-13B) [98.236(h)(1)(iv)]
[redacted]	[redacted]

: Fracturing [98.236(h)]

#N/A

Back to Summary Tab

lata for gas well completions and workovers without hydraulic fracturing:

le H.1 must be completed.

I.2 must be completed.

leted.

236(h) (see columns AF:AH).

or gas well completion and workover emission calculations.

r to the current reporting year due to reliance solely on wildcat or delineation well properties.

racturing (as applicable) . Use the navigation links below to move between the tables.

orting/subpart-w-petroleum-and-natural-gas-systems

/confluence/display/help/Optional+Calculation+Spreadsheet+Instructions

/confluence/display/help/Subpart+W+-+Petroleum+and+Natural+Gas+Systems

/confluence/pages/viewpage.action?pageId=267583519

/confluence/display/help/Gas+Well+Completions+and+Workovers+without+Hydraulic+Fracturing

Well Completions and Workovers without Hydraulic Fracturing [98.236(h)]	
mt CH_4	mt N_2O
0.00	0.000

Applicability	
gas well completions or ulic fracturing subject to 8.232 [98.236(h)]?	

onitoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
Wells without Fracturing	

ithout hydraulic fracturing (without flaring) [Table H.1]:	CLICK HERE
s *without* hydraulic fracturing (with flaring) [Table H.2]:	CLICK HERE
vell workovers *without* hydraulic fracturing [Table H.3]:	CLICK HERE
For Missing data procedures [Table H.4]:	CLICK HERE
ig data (for delays claimed two years prior) [Table H.5]:	CLICK HERE
or well-specific reporting requirements [Table AA.1.iii]:	CLICK HERE

flaring)

:tly to the atmosphere *without* hydraulic fracturing [98.236(h)(1)]:

	Average daily gas production rate	
Total number of hours that gas vented directly to atmosphere, Sum of all T_p [98.236(h)(1)(iii)]	Are the only wells in the sub-basin used to calculate "average daily gas production rate" wildcat or delineation wells subject to a 2-year delay in reporting? [98.236(h)(1)(iv)]	Average daily gas production rate, Average of all V_p (standard cubic feet/hour) [98.236(h)(1)(iv)]

ring)

***out* hydraulic fracturing [98.236(h)]:**

Average daily production rate

Total Number of hours that gas vented to a flare, Sum of all T_p [98.236(h)(2)(iii)]	Are the only wells in the sub-basin used to calculate "average daily gas production rate" wildcat or delineation wells subject to a 2-year delay in reporting? [98.236(h)(2)(iv)]	Average daily gas production rate, Average of all V_p (standard cubic feet/hour) [98.236(h)(2)(iv)]

fracturing:

Workovers that vented directly to the atmosphere		
Total count of workovers that vented directly to atmosphere without flaring [98.236(h)(3)(ii)]	Annual total CO_2 emissions that resulted from venting gas directly to the atmosphere for workovers, $E_{s,wo}$ (mt CO_2) [98.236(h)(3)(iii)]	Annual total CH_4 emissions that resulted from venting gas directly to the atmosphere for workovers, $E_{s,wo}$ (mt CH_4) [98.236(h)(3)(iv)]

Workover emission calculations

	Parameters (specify only one per row	
Flaring	Gas Well Completions without Hydraulic Fracturing (without flaring) [Table H.1]	Gas Well Completions without Hydraulic Fracturing (with flaring) [Table H.2]
[redacted]		

[redacted]

ulic Fracturing data (for delays claimed two years prior)

Average daily gas production rate for gas well completions without hydraulic fracturing and with flaring (Avg of all V_p, Eq. W-13B) [98.236(h)(2)(iv)]	Well ID Number(s) [98.236(h)(1)(iv) and (2)(iv)]
[redacted]	

11/22/2024

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Annual total CO_2 emissions that resulted from venting gas directly to the atmosphere for completions, $E_{s,p}$ (mt CO_2) [98.236(h)(1)(v)]	Annual total CH_4 emissions that resulted from venting gas directly to the atmosphere for completions, $E_{s,p}$ (mt CH_4) [98.236(h)(1)(vi)]

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Annual total CO_2 emissions that resulted from flares for completions (mt CO_2) [98.236(h)(2)(v)]	Annual total CH_4 emissions that resulted from flares for completions (mt CH_4) [98.236(h)(2)(vi)]	Annual total N_2O emissions that resulted from flares for completions (mt N_2O) [98.236(h)(2)(vii)]

Workovers with flaring		
Total count of workovers with flaring [98.236(h)(4)(ii)]	Annual total CO_2 emissions that resulted from flares for workovers (mt CO_2) [98.236(h)(4)(iii)]	Annual total CH_4 emissions that resulted from flares for workovers (mt CH_4) [98.236(h)(4)(iv)]

)		
Gas Well Workovers without Hydraulic Fracturing [Table H.3]	Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]

[redacted]

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RETURN TO TOP

Annual total N_2O emissions that resulted from flares for workovers (mt N_2O) [98.236(h)(4)(v)]

Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]	Procedures used [98.235(h)]
[redacted]	[redacted]

[redacted]

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[redacted]

Blowdown Vent Stacks [98.236(i)]

Version R.10

Worksheet Instructions:	
In accordance with 98.232, only the following industry segments must report data fo	
-Onshore natural gas processing [98.230(a)(3)]	
-Onshore natural gas transmission compression [98.230(a)(4)]	
-LNG import and export equipment [98.230(a)(7)]	
-Onshore petroleum and natural gas gathering and boosting [98.230(a)(9)]	
-Onshore natural gas transmission pipeline [98.230(a)(10)]	
For facilities with blowdown vent stacks subject to reporting, Table I.1 must be comp completed. For blowdown vent stack emissions calculated by flow meter, Table I.3 m completed. Table I.5 is required for the identification of missing data procedures use	
External Links:	
Subpart W Resources Page	https://www.epa.gov/ghgreportir
Optional Calculation Spreadsheet	https://www.ccdsupport.com/cor
Help Resources	https://www.ccdsupport.com/cor

Tota
mt CO_2
0.0

Did the facility have any blo reporting under

Best Availabl

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available fo

Blowdown Vent Sta

Blowdown Vent Stacks Emissions Calculated by Equi

Blowdown Vent Stacks Emissions Calculate

Onshore natural gas transmission pipe

For Miss

Table I.1 Blowdown Vent Stacks Emissions Type

How were emissions determined? [98.236(i)]

Table I.2 Blowdown Vent Stacks Emissions Calculated by Equipment or Event
Complete the following table for emissions that were calculated by equipment

	For Onshore natural gas transmission pipeline facilities only
Equipment or event type [98.236(i)(1)] [98.236(i)(2)]	[redacted]
[redacted]	

Table I.3 Blowdown Vent Stacks Emissions Calculated using flow meters
Complete the following table for all blowdown stacks for which emissions wer

Annual total CO_2 emissions calculated by flow meter (mt CO_2) [98.236(i)(2)(i)]	Annual total CH_4 emissions calculated by flow meter (mt CH_4) [98.236(i)(2)(ii)]
[redacted]	

Table I.4 Onshore natural gas transmission pipeline characterization

U.S. State [98.236(i)(3)]	Annual total CO_2 emissions (mt CO_2) [98.236(i)(3)(i)]
[redacted]	

Table I.5 Missing data procedures used for Blowdown Vent Stacks emission ca

Compliance Method	Type
[redacted]	

[redacted]

#N/A

Back to Summary Tab

r blowdown vent stacks:

leted. For blowdown vent stack emissions calculated by equipment or event type, Table I.2 must be
nust be completed. For Onshore natural gas transmission pipeline facilities, Table I.4 must be
d for blowdown vent stack emission calculations.

ng/subpart-w-petroleum-and-natural-gas-systems
nfluence/display/help/Optional+Calculation+Spreadsheet+Instructions
nfluence/display/help/Subpart+W+-+Petroleum+and+Natural+Gas+Systems

l Emissions for Blowdown Vent Stacks [98.236(i)]	
mt CH_4	mt N_2O
0.00	N/A

Applicability	
wdown vent stacks subject to 98.232 [98.236(i)]?	

e Monitoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
or Blowdown Vent Stack	

acks Emissions Type [Table I.1]:	CLICK HERE
ipment or Event type [Table I.2]:	CLICK HERE
ed using flow meters [Table I.3]:	CLICK HERE
line characterization [Table I.4]:	CLICK HERE
sing data procedures [Table I.5]:	CLICK HERE

type

or event type:

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Total number of blowdowns for equipment or event type, N [98.236(i)(1)(i)]	Annual total CO_2 emissions for each equipment or event type (mt CO_2) [98.236(i)(1)(ii)]	Annual total CH_4 emissions for each equipment or event type (mt CH_4) [98.236(i)(1)(iii)]
[redacted]		

RETURN TO TOP

e calculated using flow meters:

RETURN TO TOP

Annual total CH_4 emissions ($mt\ CH_4$) [98.236(i)(3)(ii)]	Annual number of blowdown events [98.236l(i)(3)(iii)]
[redacted]	[redacted]

alculations

Type (Onshore natural gas transmission pipeline)	Parameters	Measurement Frequency
[redacted]	[redacted]	[redacted]

[redacted]

11/22/2024

Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]		
[redacted]			

[redacted]

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Procedures used

[98.235(h)]

[redacted]

Atmospheric Storage Tanks [98.236(j)]

Version R.10

Worksheet Instructions:
In accordance with 98.232, only the following industry segments must report d -Onshore petroleum and natural gas production [98.230(a)(2)] -Onshore petroleum and natural gas gathering and boosting [98.230(a)(9)]
For gas-liquid separators, onshore petroleum and natural gas gathering and bo tanks for which emissions are calculated using Calculation Method 1 or 2, Tab Method 1 or 2 for gas-liquid separators, onshore petroleum and natural gas ga atmospheric storage tanks. Note that Onshore petroleum and natural gas prod gas gathering and boosting facilities should report collective emissions per cou county and state. Thus, if atmospheric tank emissions for some throughput in a throughput in the same sub-basin (or county and state) are calculated using Ca enter data for Calculation Method 2 on a second row. Similarly, a reporter may Calculation Method 3 for other throughput streams <10 barrels/day. Facilities electing to use Calculation Method 3 for gas-liquid separators, onsho throughput <10 barrels/day to atmospheric storage tanks must complete Table completed for flared emissions.

External Links:	
Subpart W Resources Page	https://www.epa.gov/ghgreporting/sul
Optional Calculation Spreadsheet	https://www.ccdsupport.com/confluer
Help Resources	https://www.ccdsupport.com/confluer
Optional delayed reporting requirements for wildcat wells and delineation wells	http://www.ccdsupport.com/confluenc

Total Em
mt CO_2
0.0

Did the facility send hydrocarbon tanks that are subject to report

Calculation Meth
Was Calculation Method 1 used to (1)]

Was Calculation Method 2 used to (2)]
Was Calculation Method 3 used to (3)]
If Calculation Method 1 or 2 were tanks observed to have malfunct calendar

Best Available M

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available for Atm

For gas-li

For gas-liquid separators, non-separator e

For gas-liquid separators, non-separator equipment, or well

For gas-liquid separators, non-separator equipment, or w

Table J.1 Gas-Liquid Separators, Non-Separator Equipment, or Wells Usi

Required only for Onshore Petroleum and Natural Gas Production	Required only for Onshore Petroleum and Natural Gas Gathering and Boosting
Sub-Basin ID **[98.236(j)(1)(i)]**	**County and State** **[98.236(j)(1)(i)]**

[redacted]

Table J.2.i Wells, separators, and non-separator equipment with oil throu
For wells, separators, and non-separator equipment using Calculation M

The oil/condensate throughput and counts of tanks and wells reported in this t
assessed using Calculation Method 3 (i.e., when emissions are calculated usi

Estimate of fraction of oil/condensate throughput sent to tanks in basin with flaring [98.236(j)(2)(i)(B)]	Estimate of fraction of oil/condensate throughput sent to tanks with vapor recovery system control measures [98.236(j)(2)(i)(C)]

Table J.2.ii Data for wells, separators, and non-separator equipment with
For wells, separators, and non-separator equipment without flaring using

Required only for Onshore Petroleum and Natural Gas Production	Required only for Onshore Petroleum and Natural Gas Gathering and Boosting
Sub-Basin ID **[98.236(j)(2)(ii)(A)]**	**County and State** **[98.236(j)(2)(ii)(A)]**

[redacted]

Table J.2.iii Data for wells, separators, and non-separator equipment witl

For wells, separators, and non-separator equipment with flaring using Ca basin or county and state:

When emissions from atmospheric storage tanks are routed to flares, section 9 composition in this section.' For Calculation Method 3, this means the volume o of CH_4 calculated using Equation W-15. This sum should be used for the term CO_2 and CH_4 are the only compounds in the flared gas.

Required only for Onshore Petroleum and Natural Gas Production	Required only for Onshore Petroleum and Natural Gas Gathering and Boosting
Sub-Basin ID **[98.236(j)(2)(iii)(A)]**	**County and State** **[98.236(j)(2)(iii)(A)]**

[redacted]

Table J.3 Emissions from improperly functioning dump valves

If Calculation Method 1 or 2 were used, and any gas-liquid separator liqui
complete the following table for each sub-basin or county and state:

Required only for Onshore Petroleum and Natural Gas Production	Required only for Onshore Petroleum and Natural Gas Gathering and Boosting
Sub-Basin ID **[98.236(j)(3)]**	**County and State** **[98.236(j)(3)]**

[redacted]

[redacted]

Table J.4 Missing data procedures used for Atmospheric Storage Tank e

Required only for Onshore Petroleum and Natural Gas Production	Required only for Onshore Petroleum and Natural Gas Gathering and Boosting
Sub-Basin ID	**County and State**
[redacted]	

Table J.5 Delayed Atmospheric Storage Tanks data (for delays claimed t

Sub-Basin ID (required for Calculation Methods 1 and 2)	**Total annual volume of oil sent to tanks from all gas-liquid separators and direct from wells (Calculation Methods 1 or 2) (bbl per year) [98.236(j)(1)(iii)]**
[redacted]	

#N/A

Back to Summary Tab

ata for gas from hydrocarbon liquids sent to atmospheric tanks:

oosting non-separator equipment, or wells with throughput ≥10 barrels/day to atmospheric storage
le J.1 must be completed. Table J.1 also must be completed by facilities electing to use Calculation
thering and boosting non-separator equipment, or wells with throughput <10 barrels/day to
luction facilities should report collective emissions per sub-basin, and Onshore petroleum and natural
inty and state. Reporters are not restricted to using only one Calculation Method per sub-basin or
a sub-basin (or county and state) are calculated using Calculation Method 1, and emissions for other
alculation Method 2, then the reporter should enter data for Calculation Method 1 on one row and
elect to use Calculation Method 1 or 2 for some throughput streams <10 barrels/day and use

re petroleum and natural gas gathering and boosting non-separator equipment, or wells with
J.2.i.Aadditionally, Table J.2.ii must be completed for non-flared emissions, and Table J.2.iii must be

opart-w-petroleum-and-natural-gas-systems
ice/display/help/Optional+Calculation+Spreadsheet+Instructions
ice/display/help/Subpart+W+-+Petroleum+and+Natural+Gas+Systems

ce/pages/viewpage.action?pageId=267583519

issions for Atmospheric Storage Tanks [98.236(j)]	
mt CH_4	**mt N_2O**
0.00	0.000

Applicability	
liquids to atmospheric storage ing under 98.232 [98.236(j)]?	

od and Malfunctioning Dump Valves [98.236(j)]	
calculate emissions [(98.233(j) ?	

calculate emissions [(98.233(j) ?	
calculate emissions [(98.233(j) ?	
e used, were any atmospheric ioning dump valves during the year?	

Monitoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
nospheric Storage Tanks	

quid separators, non-separator equipment, or wells using Calculation Method 1 or 2 [Table J.1]:

quipment, or wells with oil throughput <10 barrels/day using Calculation Method 3 [Table J.2.i]:

ls with oil throughput <10 barrels/day using Calculation Method 3 (without flaring) [Table J.2.ii]:

vells with oil throughput <10 barrels/day using Calculation Method 3 (with flaring) [Table J.2.iii]:

If separator dump valve is functioning improperly during the calendar year [Table J.3]:

For Missing data procedures [Table J.4]:

Delayed Atmospheric Storage Tanks data (for delays claimed two years prior) [Table J.5]:

ng Calculation Method 1 or 2

		Total volur
Select Calculation Method Used (Select from list) [98.236(j)(1)(ii)]	Name of software package used for Calculation Method 1 [98.236(j)(1)(ii)]	For Onshore petroleum and natural gas production facilities, are the only wells used to calculate "total volume of oil" in the sub-basin wildcat or delineation wells subject to a 2-year delay in reporting? [98.236(j)(1)(iii)]

ghput <10 barrels/day using Calculation Method 3
ethod 3, complete the following table:

able should only include those
ng Equation W-15)

	Required only for Onshore Petroleum and Natural Gas Production	
Count of atmospheric tanks in basin **[98.236(j)(2)(i)(D)]**	**Count of wells with gas-liquid separators, Count** **[98.236(j)(2)(i)(E)]**	**Count of wells without gas-liquid separators, Count** **[98.236(j)(2)(i)(F)]**

oil throughput <10 barrels/day, without flaring, using Calculation Method 3
g Calculation Method 3, complete the following table for each sub-basin or county and state:

Count of tanks that did not control emissions with flares **[98.236(j)(2)(ii)(B)]**	**Annual CO_2 emissions from tanks without flares (mt CO_2)** **[98.236(j)(2)(ii)(C)]**	**Annual CH_4 emissions from tanks without flares (mt CH_4)** **[98.236(j)(2)(ii)(D)]**

ı oil throughput <10 barrels/day, with flaring, using Calculation Method 3

ılculation Method 3, complete the following table for each sub-

98.233(j)(5)(i) requires reporters to use the 'volume and gas of flared gas should be the sum of the volume of CO_2 plus the volume V_s in Equations W-19 and W-20. Additionally, you should assume that

Count of tanks with flaring emission control measures [98.236(j)(2)(iii)(B)]	Annual CO_2 emissions from flaring (mt CO_2) [98.236(j)(2)(iii)(C)]	Annual CH_4 emissions from flaring (mt CH_4) [98.236(j)(2)(iii)(D)]

[redacted]

[redacted]

id dump valves did not close properly during the calendar year,

Count of gas-liquid separators whose liquid dump valves did not close properly [98.236(j)(3)(i)]	Total time the dump valves did not close properly, T_n (hours) [98.236(j)(3)(ii)]	CO_2 emissions from improperly functioning dump valves (mt CO_2) [98.236(j)(3)(iii)]

mission calculations

Parameters (specify only one per row)		
For gas-liquid separators, non-separator equipment, or wells using Calculation Method 1 or 2 [Table J.1]	If separator dump valve is functioning improperly during the calendar year [Table J.3]	Measurement Frequency

[redacted]

wo years prior)

RETURN TO TOP

Total annual oil throughput that is sent to all atmospheric tanks in the basin (Calculation Method 3) (bbl per yr) [98.236(j)(2)(i)(A)]	Well ID Number(s) [98.236(j)(1)(iii) and (2)(i)(A)]

[redacted]

11/22/2024

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me of oil		
Total volume of oil sent to tanks from all gas-liquid separators and direct from wells or non-separator equipment (bbl per yr) [98.236(j)(1)(iii)]	Average gas-liquid separator or non-separator equipment temperature (°F) [98.236(j)(1)(iv)]	Average gas-liquid separator or non-separator equipment pressure (psig) [98.236(j)(1)(v)]

[redacted]

RETURN TO TOP

Annual oil throughput	
For Onshore petroleum and natural gas production facilities, are the only wells in the sub-basin that were used to calculate the total annual oil/condensate throughput wildcat or delineation wells subject to a 2 year delay in reporting? [98.236(j)(2)(i)(A)]	Total annual oil/condensate throughput that is sent to all atmospheric tanks (barrels per year) [98.236(j)(2)(i)(A)]

RETURN TO TOP

RETURN TO TOP

Annual N_2O emissions from flaring (mt N_2O) [98.236(j)(2)(iii)(E)]

RETURN TO TOP

CH_4 emissions from improperly functioning dump valves ($mt\ CH_4$) [98.236(j)(3)(iv)]

Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]		
[redacted]			

	Range of CO_2 concentration of flash gas		Range of CH_4 concer
Average sales oil or stabilized oil API gravity (degrees) [98.236(j)(1)(vi)]	Minimum concentration of CO_2 in flash gas (mole fraction) [98.236(j)(1)(vii)]	Maximum concentration of CO_2 in flash gas (mole fraction) [98.236(j)(1)(vii)]	Minimum concentration of CH_4 in flash gas (mole fraction) [98.236(j)(1)(viii)]

RETURN TO TOP

Procedures used

[98.235(h)]

ntration of flash gas	Required only for Onshore Petroleum and Natural Gas Production		Required only for Onshore Petroleum and Natural Gas Production
Maximum concentration of CH_4 in flash gas (mole fraction) [98.236(j)(1)(viii)]	Number of wells sending oil to gas-liquid separators or directly to atmospheric tanks [98.236(j)(1)(ix)]	Count of atmospheric tanks [98.236(j)(1)(x)]	Estimated number of atmospheric tanks not on well pads [98.236(j)(1)(xi)]

	[redacted]		[redacted]

Emissions controlled with vapor recovery sy			
Were any emissions from atmospheric tanks controlled with vapor recovery systems? [98.236(j)(1)(xii)]	Count of tanks that control emissions with vapor recovery systems [98.236(j)(1)(xii)(A)]	Total CO_2 mass that was recovered (mt CO_2) [98.236(j)(1)(xii)(B)]	Total CH_4 mass that was recovered (mt CH_4) [98.236(j)(1)(xii)(C)]

stems		Emissions vented di	
Annual CO_2 emissions from tanks with vapor recovery systems (mt CO_2) [98.236(j)(1)(xii)(D)]	Annual CH_4 emissions from tanks with vapor recovery systems (mt CH_4) [98.236(j)(1)(xii)(E)]	Were any emissions from atmospheric tanks vented directly to the atmosphere? [98.236(j)(1)(xiii)(A)]	Count of tanks that vented directly to the atmosphere [98.236(j)(1)(xiii)(A)]

rectly to atmosphere		Em	
Annual CO_2 emissions from venting (mt CO_2) [98.236(j)(1)(xiii)(B)]	Annual CH_4 emissions from venting (mt CH_4) [98.236(j)(1)(xiii)(C)]	Were any emissions from atmospheric tanks vented to flare(s)? [98.236(j)(1)(xiv)]	Count of tanks with flaring emission control measures [98.236(j)(1)(xiv)(A)]

issions vented to flare(s)		
Annual CO_2 emissions from flaring (mt CO_2) [98.236(j)(1)(xiv)(B)]	Annual CH_4 emissions from flaring (mt CH_4) [98.236(j)(1)(xiv)(C)]	Annual N_2O emissions from flaring (mt N_2O) [98.236(j)(1)(xiv)(D)]

Transmission Storage Tanks [98.236(k)]

Version R.10

Worksheet Instructions:
In accordance with 98.232, only the following industry segment must report data f -Onshore natural gas transmission compression [98.230(a)(4)]
Table K.1 must be completed by all facilities with transmission tanks subject to re Table K.2 is required for the identification of missing data procedures used for tra

External Links:	
Subpart W Resources Page	https://www.epa.gov/ghgrepo
Optional Calculation Spreadsheet	https://ccdsupport.com/conflu
Help Resources	https://www.ccdsupport.com/

Total Emis
mt CO_2
0.0

Did the facility have any tr reporting under

Best Available Mo

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available for T

Transmissio
For Missing

Table K.1 Transmission tank emissions
Fill out the following table for each vent stack:

Unique Name or ID number for the transmission storage tank vent stack [98.236(k)(1)(i)]	Method used to determine if dump valve leakage occurred [98.236(k)(1)(ii)]

Table K.2 Missing data procedures used for Transmission Tanks emission c

Unique Name or ID number for the vent stack [98.236(k)(1)(i)]	Parameters

#N/A

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or transmission tanks:

porting under 98.232.

nsmission tank emission calculations.

rting/subpart-w-petroleum-and-natural-gas-systems
ence/display/help/Optional+Calculation+Spreadsheet+Instructions
confluence/display/help/Subpart+W+-+Petroleum+and+Natural+Gas+Systems

sions for Transmission Storage Tanks [98.236(k)]	
mt CH_4	mt N_2O
0.00	0.000

Applicability	
ansmission tanks subject to 98.232 [98.236(k)]?	

onitoring Methods (BAMM) and Missing Data

	Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
ransmission Storage Tanks		

n tank emissions [Table K.1]:	CLICK HERE
data procedures [Table K.2]:	CLICK HERE

Did dump valve leakage occur? [98.236(k)(1)(iii)]	Was there a flare attached to the transmission storage tank vent? [98.236(k)(1)(iv)]	Did scrubber valve leakage occur while the vent stack was vented directly to the atmosphere? [98.236(k)(2)]

:alculations

Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]

11/22/2024

Dump valve leakage directly to atmosphere

Method used to measure leak rate [98.236(k)(2)(i)]	Measured leak rate (standard cubic feet/hour) [98.236(k)(2)(ii)]	Duration of time leak is counted as having occurred (vented to atmosphere) (hours) [98.236(k)(2)(iii)]	CO_2 emissions from venting gas directly to the atmosphere (mt CO_2) [98.236(k)(2)(iv)]

RETURN TO TOP

Procedures used [98.235(h)]

	Fla

CH_4 emissions from venting gas directly to the atmosphere (mt CH_4) [98.236(k)(2)(v)]	Did scrubber valve leakage occur while the vent stack was vented to a flare? [98.236(k)(3)]	Method used to measure leak rate [98.236(k)(3)(i)]	Measured leak rate (standard cubic feet/hour) [98.236(k)(3)(ii)]

RETURN TO TOP

ared dump valve leakage

Duration of time that flaring occurred (hours) [98.236(k)(3)(iii)]	CO_2 emissions from flaring gas (mt CO_2) [98.236(k)(3)(iv)]	CH_4 emissions from flaring gas (mt CH_4) [98.236(k)(3)(v)]	N_2O emissions from flaring gas (mt N_2O) [98.236(k)(3)(vi)]

Well Testing [98.236(l)]

Version R.10

Worksheet Instructions:
In accordance with 98.232, only the following industry segment must report data f -Onshore petroleum and natural gas production [98.230(a)(2)]
Table AA.1.iii must be completed for each well subject to reporting under 98.236(l Tables L.1 and AA.1.iii must be completed by all facilities with well testing subject Table L.2 is required for the identification of missing data procedures used for wel Table L.3 is required for Well Testing data delayed two years prior to the current r

External Links:	
Subpart W Resources Page	https://www.epa.gov/ghgrepo
Optional Calculation Spreadsheet	https://www.ccdsupport.com/
Help Resources	https://www.ccdsupport.com/
Optional delayed reporting requirements for wildcat wells and delineation wells	https://www.ccdsupport.com/

Tota
mt CO_2
0.0

Did the facility perform we venting or flaring subject t [98.236

Best Available Mon

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available

For Missing dat

Delayed Well Testing data (for delays claimed tw

For well-specific reporting requ

Table L.1 Well testing emissions

Equation used to calculate annual volumetric natural gas emissions? [98.236(l)]	Were well testing emissions vented or flared? [98.236(l)]

Table L.2 Missing data procedures used for Well Testing emission calculati

Parameters	Equation used to calculate annual volumetric natural gas emissions? [98.236(l)]
[redacted]	

Table L.3 Delayed Well Testing data (for delays claimed two years prior)

Equation used to calculate annual volumetric natural gas emissions? [98.236(l)]	Average flow rate for oil well(s) tested and emissions are not vented to a flare (barrels per day) [98.236(l)(1)(v)]
[redacted]	

#N/A

Back to Summary Tab

or well testing:
l) (see columns AI:AK). to reporting under 98.232. ll testing emission calculations. eporting year.
rting/subpart-w-petroleum-and-natural-gas-systems confluence/display/help/Optional+Calculation+Spreadsheet+Instructions confluence/display/help/Subpart+W+-+Petroleum+and+Natural+Gas+Systems confluence/pages/viewpage.action?pageId=267583519

l Emissions for Well Testing [98.236(l)]	
mt CH_4	mt N_2O
0.00	0.000

Applicability	
ll testing that resulted in o reporting under 98.232 6(l)]?	

itoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
e for Well Testing	

Well testing [Table L.1]:	CLICK HERE
a procedures [Table L.2]:	CLICK HERE
o years prior) [Table L.3]:	CLICK HERE
irements [Table AA.1.iii]:	CLICK HERE

Number of wells tested in calendar year [98.236(l)(1)(i)] [98.236(l)(2)(i)] [98.236(l)(3)(i)] [98.236(l)(4)(i)]	Average number of days wells were tested [98.236(l)(1)(iii)] [98.236(l)(2)(iii)] [98.236(l)(3)(iii)] [98.236(l)(4)(iii)]	Are the only wells used to calculate "flow rates" or "production rates" wildcat or delineation wells subject to a 2-year delay in reporting? [98.236(l)(1)(v)] [98.236(l)(2)(v)] [98.236(l)(3)(iv)] [98.236(l)(4)(iv)]

ons

Were well testing emissions vented or flared? [98.236(l)]	Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]

Average flow rate for oil well(s) tested and emissions are vented to a flare (barrels per day) [98.236(l)(2)(v)]	Average annual production rate for gas well(s) tested and emissions are not vented to a flare (cubic feet per day) [98.236(l)(3)(iv)]	Average annual production rate for gas well(s) tested and emissions are vented to a flare (cubic feet per day) [98.236(l)(4)(iv)]

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For Equation W-17A		For Equation W-17B	
Average Gas to Oil Ratio (GOR) for Wells Tested (cubic feet of gas per barrel oil) [98.236(l)(1)(iv)] [98.236(l)(2)(iv)]	Average flow rate for well(s) tested, FR (barrels of oil per day) [98.236(l)(1)(v)] [98.236(l)(2)(v)]	Average annual production rate for well(s) tested (cubic feet per day) [98.236(l)(3)(iv)] [98.236(l)(4)(iv)]	Is GOR (for W-17A) or production rate (for W-17B) reported on an Actual or Standard basis? [98.236]
[redacted]			

RETURN TO TOP

Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]	Procedures used [98.235(h)]
[redacted]	

RETURN TO TOP

Was production rate based on actual or standard conditions? [98.236]	Temperature used to calculate the annual production rate (°F) [98.233]	Pressure used to calculate the annual production rate (psi) [98.233]	Well ID Number(s) [98.236(l)(v), (2)(v), (3)(iv), and (4)(iv)]
[redacted]			

		Venting Emissions	
Temperature used to calculate GOR or production rate (^{o}F) [98.236]	Pressure used to calculate GOR or production rate (psi) [98.236]	Total CO_2 emissions from venting (mt CO_2) [98.236(l)(1)(vi)] [98.236(l)(3)(v)]	Total CH_4 emissions from venting (mt CH_4) [98.236(l)(1)(vii)] [98.236(l)(3)(vi)]
[redacted]			

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Flaring Emissions		
Total CO_2 emissions from flaring (mt CO_2) [98.236(l)(2)(vi)] [98.236(l)(4)(v)]	Total CH_4 emissions from flaring (mt CH_4) [98.236(l)(2)(vii)] [98.236(l)(4)(vi)]	Total N_2O emissions from flaring (mt N_2O) [98.236(l)(2)(vii)] [98.236(l)(4)(vii)]
[redacted]		

Associated Natural Gas [98.236(m)]

Version R.10

Worksheet Instructions:
In accordance with 98.232, only the following industry segment must report data f -Onshore petroleum and natural gas production [98.230(a)(2)]
Table AA.1.iii must be completed for each well subject to reporting under 98.236(Tables M.1 and AA.1.iii must be completed by all facilities with associated gas ve Table M.2 is required for the identification of missing data procedures used for as Table M.3 is required for Associated Natural Gas data delayed two years prior to

External Links:	
Subpart W Resources Page	https://www.epa.gov/ghgrepo
Optional Calculation Spreadsheet	https://www.ccdsupport.com/
Help Resources	https://www.ccdsupport.com/
Optional delayed reporting requirements for wildcat wells and delineation wells	https://www.ccdsupport.com/

Total Emissio
mt CO_2
0.0

Did the facility have any flaring subject to reportir

Best Available M

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not availab

Associated Gas Ve

For Missing

Delayed Associated NG data (for delays claime

For well-specific reporting

Table M.1 Associated Gas Venting and Flaring

Sub-Basin ID [98.236(m)(1)]	Was the associated natural gas vented or flared? [98.236(m)(2)] [98.236(m)(3)]
[redacted]	

[redacted]

Table M.2 Missing data procedures used for Associated Gas Venting and Fla

Sub-basin ID	Parameters
[redacted]	

Table M.3 Delayed Associated NG data (for delays claimed two years prior)

Sub-Basin ID	Volume of oil produced during venting/flaring (barrels) [98.236(m)(5)]
[redacted]	

#N/A

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or associated gas venting and flaring:

m) (see columns AL:AM).

nting or flaring subject to reporting under 98.232.

sociated gas emission calculations.

the current reporting year.

rting/subpart-w-petroleum-and-natural-gas-systems
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confluence/display/help/Subpart+W+-+Petroleum+and+Natural+Gas+Systems

confluence/pages/viewpage.action?pageId=267583519

ons for Associated Gas Venting and Flaring [98.236(m)]	
mt CH_4	mt N_2O
0.00	0.000

Applicability	
associated gas venting or ng under 98.232 [98.236(m)]?	

Monitoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
le for Associated NG	

enting and Flaring [Table M.1]:	CLICK HERE
g data procedures [Table M.2]:	CLICK HERE
d two years prior) [Table M.3]:	CLICK HERE

requirements [Table AA.1.iii]: CLICK HERE

Did You Use a Continuous Flow Measurement Device, Use GOR to Calculate the Gas Volume, or Both? [98.236(m)(4)] [98.236(m)(5)] [98.236(m)(6)]	Average gas to oil ratio for the Sub-Basin, Average of GOR (standard cubic feet of gas per barrel of oil) [98.236(m)(4)]	Are the only wells in the sub-basin used to determine "volume of oil produced" or "volume of associated gas sent to sales" wildcat or delineation wells subject to a 2-year delay in reporting? [98.236(m)(5)] [98.236(m)(6)]
[redacted]		

[redacted]

aring emission calculations

Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]
[redacted]		

	RETURN TO TOP
Volume of associated gas sent to sales (standard cubic feet) **[98.236(m)(6)]**	**Well ID Number(s)** **[98.236(m)(5) and (6)]**

11/22/2024

		Venting Emis	
Volume of oil produced during venting/flaring, Sum of $V_{p,q}$ (barrels) [98.236(m)(5)]	Volume of associated gas sent to sales, Sum of SG (standard cubic feet) [98.236(m)(6)]	Number of wells venting associated gas [98.236(m)(7)(i)]	Volume of Associated Gas Vented (standard cubic feet) [98.236(m)(7)(ii)]
[redacted]			

[redacted]

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Procedures used

[98.235(h)]

[redacted]

ssions		Flaring En	
Annual CO_2 emissions from venting (mt CO_2) [98.236(m)(7)(iii)]	Annual CH_4 emissions from venting (mt CH_4) [98.236(m)(7)(iv)]	Number of wells flaring associated gas [98.236(m)(8)(i)]	Annual CO_2 emissions from flaring (mt CO_2) [98.236(m)(8)(ii)]

[redacted]

[redacted]

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nissions	
Annual CH_4 emissions from flaring (mt CH_4) [98.236(m)(8)(iii)]	Annual N_2O emissions from flaring (mt N_2O) [98.236(m)(8)(iv)]

[redacted]

Flare Stacks [98.236(n)]

Version R.10

Worksheet Instructions:

In accordance with 98.232, only the following industry segments must report data

- -Onshore petroleum and natural gas production [98.230(a)(2)]
- -Onshore natural gas processing [98.230(a)(3)]
- -Onshore natural gas transmission compression [98.230(a)(4)]
- -Underground natural gas storage [98.230(a)(5)]
- -LNG storage [98.230(a)(6)]
- -LNG import and export equipment [98.230(a)(7)]
- -Onshore petroleum and natural gas gathering and boosting [98.230(a)(9)]

IMPORTANT NOTE: The total flare emissions determined under 98.233(n) must
double counting; the flare emissions to report here should include only flare emiss
reported for each flare should encompass all streams routed to the flare, even if s

Table N.1 must be completed by all facilities with flare stacks subject to reporting

Table N.2 is required for the identification of missing data procedures used for flar

External Links:

Subpart W Resources Page	https://www.epa.gov/ghgrepo
Optional Calculation Spreadsheet	https://www.ccdsupport.com/
Help Resources	https://www.ccdsupport.com/

Tota
mt CO_2
0.0

Did the facility have fla reporting under 98

Best Available Mon

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available

For Missing dat

Table N.1 Flare Stacks

Unique Name or ID Number for the Flare Stack [98.236(n)(1)]	Were CEMS used to measure CO_2 emissions for the flare stack? [98.233(n)(8)] [98.236(n)(12)]

Table N.2 Missing data procedures used for Flare Stacks emission calculati

Unique Name or ID Number for the Flare Stack	Parameters
[redacted]	

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

#N/A

[Back to Summary Tab]

for flare stacks:

be corrected for flare emissions calculated and reported under other tabs to avoid
sions that are not reported under any other tab [98.233(n)(9)]. However, activity data
some emissions are reported under other tabs [98.233(n) and 98.236(n)].

under 98.232.

re stack emission calculations.

rting/subpart-w-petroleum-and-natural-gas-systems
confluence/display/help/Optional+Calculation+Spreadsheet+Instructions
confluence/display/help/Subpart+W+-+Petroleum+and+Natural+Gas+Systems

l Emissions for Flare Stacks [98.236(n)]	
mt CH_4	**mt N_2O**
0.00	0.000

Applicability	
are stacks subject to .232 [98.236(n)]?	

itoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	**Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]**
e for Flare Stacks	

Flare Stacks [Table N.1]:	CLICK HERE
a procedures [Table N.2]:	CLICK HERE

Does the flare stack have a continuous flow monitor on gas to the flare? [98.236(n)(2)]	Does the flare stack have a continuous gas analyzer on gas to the flare? [98.236(n)(3)]	Volume of gas sent to flare, V_s (standard cubic feet) [98.236(n)(4)]

ons

Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]
[redacted]		

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

11/22/2024

Fraction of feed gas sent to un-lit flare, Z_u [98.236(n)(5)]	Flare combustion efficiency (decimal value) [98.236(n)(6)]	Mole fraction of CH_4 in flare feed gas, X_{CH4} [98.236(n)(7)]	Mole fraction of CO_2 in flare feed gas, X_{CO2} [98.236(n)(8)]

RETURN TO TOP

Procedures Used

[98.235(h)]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

RETURN TO TOP

CO_2 emissions (mt CO_2) [98.236(n)(9)]	CH_4 Emissions (mt CH_4) (Eq. W-19) [98.236(n)(10)]	N_2O Emissions (mt N_2O) (Eq. W-40) [98.236(n)(11)]

Centrifugal Compressors [98.236(o)]

Version R.10

Worksheet Instructions:
In accordance with 98.232, only the following industry segments must report
-Onshore petroleum and natural gas production [98.230(a)(2)]
-Onshore natural gas processing [98.230(a)(3)]
-Onshore natural gas transmission compression [98.230(a)(4)]
-Underground natural gas storage [98.230(a)(5)]
-Liquefied natural gas (LNG) storage [98.230(a)(6)]
-LNG import and export equipment [98.230(a)(7)]
-Onshore petroleum and natural gas gathering and boosting [98.230(a)(9)

Tables O.1, O.2.i, and O.2.ii must be completed by all facilities with centrifug facilities and Onshore petroleum and natural gas gathering and boosting faci

Tables O.3.i and O.3.ii must be completed by facilities using “as found” meas production facilities and Onshore petroleum and natural gas gathering and b

Table O.4 must be completed by facilities using “continuous” measurement c petroleum and natural gas gathering and boosting facilities).

Table O.5 must be completed by Onshore petroleum and natural gas produc

Table O.6 is required for the identification of missing data procedures used f

External Links:	
Subpart W Resources Page	https://www.epa.gov/ghgrepo
Optional Calculation Spreadsheet	https://www.ccdsupport.com/
Help Resources	https://www.ccdsupport.com/

T
mt CO_2
0.0

Did the facility have any reporting un

For Onshore Petroleum Onshore Petroleum and N facilities: Did you use volu emissions from

Best Ava

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available

Compress
Compresso
Compre
Leak or Vent “As Found” Mea
Reporter Emission Factors for “As Found” Mea
Leak or Vent C
Onshore Petroleum and Natural Gas Production and G&B C
For

Table O.1 Compressor-Specific Activity Data

Complete the following table for each centrifugal compressor (except fo

Compressor ID or Unique Name [98.236(o)(1)(i)]	Total time in operating-mode (hours) [98.236(o)(1)(ii)]

Table O.2.i Compressor Source-Specific Data

Complete the following table for each compressor source at each centr
Onshore Petroleum and Natural Gas Gathering and Boosting segments

Unique Compressor Name or ID [98.236(o)(2)(i)(A)]	Centrifugal compressor source [98.236(o)(2)(i)(B)]

Table O.2.ii Compressor Leak or Vent Data

Complete the following table for each individual leak or vent and each r
Natural Gas Production and Onshore Petroleum and Natural Gas Gathe

Unique Name or ID for leak or vent [98.236(o)(2)(i)(C)]	Leak or vent for a single compressor source or a manifolded group? [98.236(o)(2)(ii)(A)] [98.236(o)(1)(vi)]
Err:502	
Err:502	
Err:502	
Err:502	
Err:502	
Err:502	
Err:502	
Err:502	
Err:502	
Err:502	
Err:502	
Err:502	
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Err:502	
Err:502	

Table O.3.i Leak or Vent “As Found” Measurement Sample Data

Complete the following table for each centrifugal compressor leak or ve
and Natural Gas Production and Natural Gas Production and Onshore P

If emissions were not detected, report only the screening method belov
(i)(C)].

If multiple measurements events for a specific leak/vent occurred, repo

If the applicable leak or vent was not measured in Operating mode, plea

If the applicable leak or vent was not measured in Not-operating mode,

Unique Name or ID for leak or vent (Specify) [98.236(o)(3)(i)(A)]	Measurement date (mm/dd/yyyy) [98.236(o)(3)(i)(B)]

Table O.3.ii Reporter Emission Factors for "As Found" Measurement Sa

Complete the following table for each centrifugal compressor mode-sou calculated using Eq. W-23, as specified in 98.233(o)(6)(iii) and (iv), and u Natural Gas Production and Onshore Petroleum and Natural Gas Gathe

Compressor mode-source combinations for which reporter emission factors were developed

Compressor Mode [98.236(o)(3)(ii)(A)]	Compressor Source [98.236(o)(3)(ii)(A)]
Operating	Wet seal
Operating	Blowdown valve
Not-operating	Isolation valve

Table O.4 Leak or Vent Continuous Measurement

Complete the following table for each centrifugal compressor leak or ve
(3) or (5) (except for those in the Onshore Petroleum and Natural Gas P
Natural Gas Gathering and Boosting segments that calculate emissions

WARNING: Data must be entered in sequential rows. e-GGRT will not process records after an empty row.

Unique Name or ID for leak or vent [98.236(o)(4)(i)]	Measured volume of flow during the reporting year, $Q_{s,v}$, $Q_{s,g}$ (million standard cubic feet) [98.236(o)(4)(ii)]

Table O.5 Onshore Petroleum and Natural Gas Production and Onshore
Gathering and Boosting Centrifugal Compressors that Calculate Emissi

Number of Centrifugal Compressors with wet seal oil degassing vents, Count [98.236(o)(5)(i)]	Total annual Centrifugal Compressor emissions CO_2 Emissions (mt CO_2) [98.236(o)(5)(ii)]

Table O.6 Missing data procedures used for Centrifugal Compressor en

Types of Data	Compressor ID
Table O.1 Compressor Activity Data	

	[redacted]
Table O.3.i Leak or Vent "As Found" Measurement Sample Data	[redacted]
Table O.3.ii Leak or Vent Reporter Emission Factors for "As Found" Measurement Sample Data	[redacted]
Table O.4 Leak or Vent Continuous Measurement Data	[redacted]

Table O.5 Onshore Petroleum and Natural Gas Production and Onshore Petroleum and Natural Gas Gathering and Boosting Centrifugal Compressors	

#N/A

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data for centrifugal compressors:

)]

al compressors subject to reporting under 98.232 (except Onshore petroleur
lities).

surement sample data, i.e., 98.233(o)(2 or 4) and (o)(6) (except Onshore pet
oosting facilities).

lata, i.e., 98.233(o)(3 or 5) (except Onshore petroleum and natural gas produ

tion facilities and Onshore petroleum and natural gas gathering and boosting

or centrifugal compressor emission calculations.

orting/subpart-w-petroleum-and-natural-gas-systems
/confluence/display/help/Optional+Calculation+Spreadsheet+Instructions
/confluence/display/help/Subpart+W+-+Petroleum+and+Natural+Gas+Syster

Total Emissions for Centrifugal Compressors [98.236(o)]	
mt CH_4	mt N_2O
0.00	N/A

Applicability	
centrifugal compressors subject to der 98.232 [98.236(o)]?	

n and Natural Gas Production and Natural Gas Gathering and Boosting umetric measurements to determine centrifugal compressors?	

ilable Monitoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
e for Centrifugal Compressors	

sor-Specific Activity Data [Table O.1]:	CLICK HERE
or Source-Specific Data [Table O.2.i]:	CLICK HERE
essor Leak or Vent Data [Table O.2.ii]:	CLICK HERE
asurement Sample Data [Table O.3.i]:	CLICK HERE
asurement Sample Data [Table O.3.ii]:	CLICK HERE
Continuous Measurement [Table O.4]:	CLICK HERE
Centrifugal Compressors [Table O.5]:	CLICK HERE
Missing data procedures [Table O.6]:	CLICK HERE

or those in the Onshore Petroleum and Natural Gas Production and Ons

Total time in not-operating-depressurized-mode (hours) [98.236(o)(1)(iii)]	Compressor measured in operating-mode? [98.236(o)(1)(iv)]

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ifugal compressor (except for those in the Onshore Petroleum and Nat
that calculate emissions according to §98.233(o)(10)(iii)):

Leave column blank if no changes made

Unique Name or ID for leak or vent [98.236(o)(2)(i)(C)]	Unit Name or ID for leak or vent if release point changed or controls added during the reporting year [98.236(o)(2)(i)(C)]

manifolded vent for centrifugal compressors (except for those in the Or
ring and Boosting segments that calculate emissions according to §98

Where are leak or vent emissions released? [98.236(o)(2)(ii)(A)] [98.236(o)(1)(vii) through (ix)]	Was an "as found" measurement conducted on the leak or vent? [98.236(o)(2)(ii)(B)]

ent with "as found" measurement sample data determined using 98.23
Petroleum and Natural Gas Gathering and Boosting segments that calc

v. If emissions were detected, report only the method subsequently use

rt these events on separate rows of Table O.3.i.

ase leave column G blank.

please leave column H blank.

Measurement method [98.236(o)(3)(i)(C)]	Measured flow rate, $MT_{s,m}$, $MT_{s,g,avg}$ (standard cubic feet/hour) [98.236(o)(3)(i)(D)]

ample Data

urce combination with "as found" measurement sample data where a r
used in Equation W-22 to calculate emissions (except for those in the C
ring and Boosting segments that calculate emissions according to §98

Compressor mode-source combination reporter emission factor, $EF_{s,m}$ (standard cubic feet per hour) [98.236(o)(3)(ii)(B)]	Total number of compressors measured in the compressor mode-source combination in current reporting year and preceding two reporting years [98.236(o)(3)(ii)(C)]

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ent with "continuous" measurement data determined using 98.233(o) roduction and Natural Gas Production and Onshore Petroleum and s according to §98.233(o)(10)(iii)):

Did the measured volume of flow during the reporting year include compressor blowdowns? [98.236(o)(4)(iii)]	Is the measurement location prior to or after commingling with non-compressor emission sources [98.236(o)(4)(iv)]

e Petroleum and Natural Gas
ions According to §98.233(o)(10)(iii))

RETURN TO TOP

Total annual Centrifugal Compressor emissions CH_4 Emissions (mt CH_4) [98.236(o)(5)(iii)]

nission calculations

Unique Name or ID for leak or vent	Compressor mode

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

11/22/2024

n and natural gas production troleum and natural gas uction facilities and Onshore g facilities.
ns

shore Petroleum and Natural Gas Gathering and Boosting segments that calculate er

Compressor measured in not-operating-depressurized-mode? [98.236(o)(1)(v)]	Compressor had blind flanges installed? [98.236(o)(1)(x)]	Dates for blind flange installation (mm/dd/yyyy - mm/dd/yyyy) [98.236(o)(1)(x)]

ural Gas Production and Natural Gas Production and

ıshore Petroleum and Natural Gas Production and
ˈ.233(o)(10)(iii)):

Were continuous measurements conducted on the leak or vent? [98.236(o)(2)(ii)(C)]	CO_2 emissions vented to atmosphere (mt CO_2) [98.236(o)(2)(ii)(D)(1)]	CH_4 emissions vented to atmosphere (mt CH_4) [98.236(o)(2)(ii)(D)(2)]

[redacted]

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3(o)(2) or (4) (except for those in the Onshore Petroleum
ulate emissions according to §98.233(o)(10)(iii)):

ed to report the volumetric emission [as per 98.236(o)(3)

	Mode for each compressor during leak or vent measurement [98.236(o)(3)(i)(E)]	
Is the measurement location prior to or after commingling with non-compressor emission sources? [98.236(o)(3)(i)(F)]	Compressors in "Operating mode"	Compressors in "Not-operating mode"

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eporter emission factor was
Onshore Petroleum and
.233(o)(10)(iii)):

Is the reporter emission factor facility-specific or based on all of the reporter's applicable facilities? [98.236(o)(3)(ii)(D)]

Compressor source	Parameters	Measurement Frequency
[redacted]		

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

missions according to §98.233(o)(10)(iii)):

Seal Type (wet or dry) [98.236(o)(1)(xi)]	Number of wet seals [98.236(o)(1)(xii)]	Power output of compressor driver (hp) [98.236(o)(1)(xiii)]

	[redacted]	

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Percentage of time the device was operational when compressor source emissions were routed to device [98.236(o)(2)(ii)(E)]
[redacted]

[redacted]

Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]	
[redacted]		

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

RETURN TO TOP

Compressor had scheduled depressurized shutdown during reporting year? [98.236(o)(1)(xiv)]

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Procedures used

[98.235(h)]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Reciprocating Compressors [98.236(p)]

Version R.10

Worksheet Instructions:

In accordance with 98.232, only the following industry segments must report data fo

- -Onshore petroleum and natural gas production [98.230(a)(2)]
- -Onshore natural gas processing [98.230(a)(3)]
- -Onshore natural gas transmission compression [98.230(a)(4)]
- -Underground natural gas storage [98.230(a)(5)]
- -Liquefied natural gas (LNG) storage [98.230(a)(6)]
- -LNG import and export equipment [98.230(a)(7)]
- -Onshore petroleum and natural gas gathering and boosting [98.230(a)(9)]

Tables P.1, P.2.i, and P.2.ii must be completed by all facilities with reciprocating com facilities and Onshore petroleum and natural gas gathering and boosting facilities).

Tables P.3.i and P.3.ii must be completed by facilities using "as found" measuremen facilities and Onshore petroleum and natural gas gathering and boosting facilities).

Table P.4 must be completed by facilities using "continuous" measurement data, i.e. petroleum and natural gas gathering and boosting facilities).

Table P.5 must be completed by Onshore petroleum and natural gas production faci

Table P.6 is required for the identification of missing data procedures used for recipr

External Links:

Subpart W Resources Page	https://www.epa.gov/ghgreporting
Optional Calculation Spreadsheet	https://www.ccdsupport.com/conf
Help Resources	https://www.ccdsupport.com/conf

Total Er
mt CO_2
0.0

Did the facility have any recip reporting under

For Onshore Petroleum an Onshore Petroleum and Natu facilities: Did you use volume emissions from recip

Best Available

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available for F

Compressor
Compressor S
Compress
Leak or Vent "As Found" Measu
Reporter Emission Factors for "As Found" Measu
Leak or Vent Con
Onshore Petroleum and Natural Gas Production and G&B Recipr
For Mis

Table P.1 Compressor-Specific Activity Data

Complete the following table for each reciprocating compressor (except for th

Unique name or ID for reciprocating compressor [98.236(p)(1)(i)]	Total time in operating-mode (hours) [98.236(p)(1)(ii)]

Table P.2.i Compressor Source-Specific Data

Complete the following table for each compressor source at each reciprocatin Natural Gas Production and Onshore Petroleum and Natural Gas Gathering an §98.233(p)(10)(iii)):

Unique name or ID for reciprocating compressor [98.236(p)(2)(i)(A)]	Reciprocating compressor source [98.236(p)(2)(i)(B)]

Table P.2.ii Compressor Leak or Vent Data

Complete the following table for each individual leak or vent and each manifol
Gathering and Boosting segments that calculate emissions according to §98.2

Unique Name or ID for leak or vent [98.236(p)(2)(i)(C)]	Leak or vent for a single compressor source or a manifolded group? [98.236(p)(2)(ii)(A)] [98.236(p)(1)(viii)]

Table P.3.i Leak or Vent “As Found” Measurement Sample Data

Complete the following table for each reciprocating compressor leak or vent w and Natural Gas Production and Onshore Petroleum and Natural Gas Gatherin

If emissions were not detected, report only the screening method below. If em (C)].

If multiple measurements events for a specific leak/vent occurred, report these

If the applicable leak or vent was not measured in Operating mode, please leav

If the applicable leak or vent was not measured in Standby-pressurized mode,

If the applicable leak or vent was not measured in Not-operating mode, please

Unique Name or ID for leak or vent (Specify) [98.236(p)(2)(i)(C)] [98.236(p)(3)(i)(A)]	Measurement date (mm/dd/yyyy) [98.236(p)(3)(i)(B)]

Table P.3.ii Reporter Emission Factors for “As Found” Measurement Sample D

Complete the following table for each reciprocating compressor mode-source calculated using Eq. W-28, as specified in 98.233(p)(6)(iii) and (iv), and used ir Gas Production and Onshore Petroleum and Natural Gas Gathering and Boost

Compressor mode-source combinations for which reporter emission factors were developed

Compressor Mode [98.236(p)(3)(ii)(A)]	Compressor Source [98.236(p)(3)(ii)(A)]
Operating	Blowdown valve
Operating	Rod packing
Standby-pressurized	Blowdown valve
Not-operating-depressurized	Isolation valve

Table P.4 Leak or Vent Continuous Measurement

Complete the following table for each reciprocating compressor leak or vent w 98.233(p)(3) or (5) (except for those in the Onshore Petroleum and Natural Gas and Boosting segments that calculate emissions according to §98.233(p)(10)(i

WARNING: Data must be entered in sequential rows. e-GGRT will not process records after an empty row.

Unique Name or ID for leak or vent [98.236(p)(2)(i)(C)] [98.236(p)(4)(i)]	Measured volume of flow during the reporting year $Q_{s,v}$, $Q_{s,g}$ (million standard cubic feet) [98.236(p)(4)(ii)]

Table P.5 Onshore Petroleum and Natural Gas Production and Onshore Petrol
and Boosting Reciprocating Compressors that Calculate Emissions According

Count of Reciprocating Compressors [98.236(p)(5)(i)]	Total annual Reciprocating Compressor emissions CO_2 Emissions (mt CO_2) [98.236(p)(5)(ii)]

Table P.6 Missing data procedures used for Reciprocating Compressor emissi

Type of Data	Compressor ID
Table P.1 Compressor Activity Data	

Table P.3.i Leak or Vent "As Found" Measurement Sample Data	[redacted]
Table P.3.ii Leak or Vent Reporter Emission Factors for "As Found" Measurement Sample Data	[redacted]
Table P.4 Leak or Vent Continuous Measurement Data	[redacted]

Table P.5 Onshore Petroleum and Natural Gas Production and Onshore Petroleum and Natural Gas Gathering and Boosting Reciprocating Compressors	[redacted]

#N/A

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r reciprocating compressors:

npressors subject to reporting under 98.232 (except Onshore petroleu

nt sample data, i.e., 98.233(p)(2 or 4) and (p)(6) (except Onshore petr

, 98.233(p)(3 or 5) (except Onshore petroleum and natural gas produ

lities and Onshore petroleum and natural gas gathering and boosting

rocating compressor emission calculations.

g/subpart-w-petroleum-and-natural-gas-systems
fluence/display/help/Optional+Calculation+Spreadsheet+Instructions
fluence/display/help/Subpart+W+-+Petroleum+and+Natural+Gas+Sys

nissions for Reciprocating Compressors [98.236(p)]	
mt CH_4	**mt N_2O**
0.00	N/A

Applicability	
rocating compressors subject to 98.232 [98.236(p)]?	

d Natural Gas Production and ıral Gas Gathering and Boosting ıtric measurements to determine ɔrocating compressors?	

: Monitoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
Reciprocating Compressors	

-Specific Activity Data [Table P.1]:	CLICK HERE
Source-Specific Data [Table P.2.i]:	CLICK HERE
or Leak or Vent Data [Table P.2.ii]:	CLICK HERE
ırement Sample Data [Table P.3.i]:	CLICK HERE
rement Sample Data [Table P.3.ii]:	CLICK HERE
ıtinuous Measurement [Table P.4]:	CLICK HERE
rocating Compressors [Table P.5]:	CLICK HERE
ssing data procedures [Table P.6]:	CLICK HERE

ose in the Onshore Petroleum and Natural Gas Production and C

Total time in standby-pressurized-mode (hours) [98.236(p)(1)(iii)]	Total time in not-operating-depressurized-mode (hours) [98.236(p)(1)(iv)]

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g compressor (except for those in the Onshore Petroleum and
d Boosting segments that calculate emissions according to

Leave column blank if no changes made

Unique Name or ID for leak or vent [98.236(p)(2)(i)(C)]	Unit Name or ID for leak or vent if release point changed or controls added during the reporting year [98.236(p)(2)(i)(C)]

ded vent for reciprocating compressors (except for those in the
33(p)(10)(iii)):

Where are leak or vent emissions released? [98.236(p)(2)(ii)(A)] [98.236(p)(1)(ix) through (xi)]	Was an "as found" measurement conducted on the leak or vent? [98.236(p)(2)(ii)(B)]

ith “as found” measurement sample data determined using 98.2
g and Boosting segments that calculate emissions according to

issions were detected, report only the method subsequently use

e events on separate rows of Table P.3.i.

ve column G blank.

please leave column H blank.

leave column I blank.

Measurement method [98.236(p)(3)(i)(C)]	Measured flow rate (standard cubic feet/hour) [98.236(p)(3)(i)(D)]

Data

combination with “as found” measurement sample data where a
Equation W-27 to calculate emissions (except for those in the
ing segments that calculate emissions according to §98.233(p)(

Compressor mode-source combination reporter emission factor, $EF_{s,m}$ (standard cubic feet per hour) [98.236(p)(3)(ii)(B)]	Total number of compressors measured in the compressor mode-source combination in current reporting year and preceding two reporting years, $Count_m$ [98.236(p)(3)(ii)(C)]

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/ith "continuous" measurement data determined using · Production and Onshore Petroleum and Natural Gas Gathering ii)):

Did the measured volume of flow during the reporting year include compressor blowdowns? [98.236(p)(4)(iii)]	Is the measurement location prior to or after commingling with non-compressor emission sources? [98.236(p)(4)(iv)]

eum and Natural Gas Gathering
g to §98.233(p)(10)(iii))

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Total annual Reciprocating Compressor emissions CH_4 Emissions (mt CH_4) [98.236(p)(5)(iii)]

ion calculations

Unique Name or ID for leak or vent	Compressor mode

[redacted]

[redacted]

[redacted]

[redacted]

11/22/2024

um and natural gas production oleum and natural gas production iction facilities and Onshore facilities.
stems

Onshore Petroleum and Natural Gas Gathering and Boosting segments that calculate emiss

Compressor measured in operating-mode? [98.236(p)(1)(v)]	Compressor measured in standby-pressurized-mode? [98.236(p)(1)(vi)]	Compressor measured in not-operating-depressurized-mode? [98.236(p)(1)(vii)]

Onshore Petroleum and Natural Gas Production and Onshore Petroleum and Natural Gas

Were continuous measurements conducted on the leak or vent? [98.236(p)(2)(ii)(C)]	CO_2 Emissions vented to atmosphere (mt CO_2) [98.236(p)(2)(ii)(D)(1)]	CH_4 Emissions vented to atmosphere (mt CH_4) [98.236(p)(2)(ii)(D)(2)]

[redacted]

:33(p)(2) or (4) (except for those in the Onshore Petroleum
§98.233(p)(10)(iii)):

:d to report the volumetric emission [as per [98.236(p)(3)(i)

	Mode for each compressor during leak or [98.236(p)(3)(i)(E)]	
Is the measurement location prior to or after commingling with non-compressor emission sources? [98.236(p)(3)(i)(F)]	Compressors in “Operating mode”	Compressors in "Standby-pressurized mode"

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a reporter emission factor was Onshore Petroleum and Natural 10)(iii)):

Is the reporter emission factor facility-specific or based on all of the reporter's applicable facilities? [98.236(p)(3)(ii)(D)]

Compressor source	Parameters	Measurement Frequency
[redacted]		

[redacted]

[redacted]

[redacted]

[redacted]

ions according to §98.233(p)(10)(iii):

Compressor had blind flanges installed? [98.236(p)(1)(xii)]	Dates for blind flange installation (mm/dd/yyyy - mm/dd/yyyy) [98.236(p)(1)(xii)]	Power output of compressor driver (hp) [98.236(p)(1)(xiii)]

[redacted]

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Percentage of time the device was operational when compressor source emissions were routed to device [98.236(p)(2)(ii)(E)]
[redacted]

[redacted]

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vent measurement
Compressors in “Not-operating mode”

Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]	
[redacted]		

[redacted]

[redacted]

[redacted]

[redacted]

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Compressor had scheduled depressurized shutdown during reporting year? [98.236(p)(1)(xiv)]

RETURN TO TOP

Procedures used

[98.235(h)]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Equipment Leaks Surveys and Population Counts

Version

Worksheet Instructions:
In accordance with 98.232, only the following industry segments mu
-Onshore petroleum and natural gas production [98.230(a)(2)]
-Onshore natural gas processing [98.230(a)(3)]
-Onshore natural gas transmission compression [98.230(a)(4)]
-Underground natural gas storage [98.230(a)(5)]
-Liquefied natural gas (LNG) storage [98.230(a)(6)]
-LNG import and export equipment [98.230(a)(7)]
-Natural Gas Distribution [98.230(a)(8)]
-Onshore petroleum and natural gas gathering and boosting [98
External Links:
Subpart W Resources Page
Optional Calculation Spreadsheet
Help Resources
Equipment Leaks Help Content

Industry-specific navigation links
As required for leak surveys in 98.236(q)
As required for population counts in 98.236(r)
As required if missing data procedures were used 98.235

Table Q.1 Leak Survey Characterization

Number of complete equipment leak surveys performed during the calendar year [98.236(q)(1)(i)]

Table Q.2.i Leak Survey Calculation Method

Were Emissions for a Complete Leak Survey Calculated Using Calculation Method 1? (Leaker Emission Factor Calculation Methodology) [98.236(q)(1)(vi)]

Table Q.2.ii: Emissions Calculated for Component Types Usin
Complete the following table for each component type that use

Report the count of components surveyed of all component types and the emissions from those component types (as calculated by Equation W-30) for your industry segment. ***If no leaks were identified from any components of a component type during the leak survey, enter "0" in columns G through I for that component type.***
Onshore petroleum and natural gas production and Onshore petroleum and natural gas gathering and boosting [98.232(c)(21) and (j)10)] (Table W-1E)
Onshore natural gas processing [98.232(d)(7)] - (Table W-2)

Onshore natural gas transmission compression [98.232(e)(7-8)] (Table W-3A)
Underground natural gas storage [98.232(f)(5-8)] (Table W-4A)
Liquefied natural gas (LNG) storage [98.232(g)(4,6,7)] (Table W-5A)
LNG import and export equipment [98.232(h)(5,7,8)] (Table W-6A)

Natural gas distribution [Note: limited to equipment leaks at above grade transmission-distribution transfer stations] [98.232(i)(1)] (Table W-7)

Table Q.2.iii: Emissions Calculated for Component Types Usin
Complete the following table for each component type that use

Report the count of components surveyed of all component types and the emissions from those component types (as calculated by Equation W-30) for your industry segment. ***If no leaks were identified from any components of a component type during the leak survey, enter "0" in columns G through I for that component type.***
Onshore petroleum and natural gas production and Onshore petroleum and natural gas gathering and boosting [98.232(c)(21) and (j)10)] (Table W-1E)
Onshore natural gas processing [98.232(d)(7)] - (Table W-2)

Onshore natural gas transmission compression [98.232(e)(7-8)] (Table W-3A)
Underground natural gas storage [98.232(f)(5-8)] (Table W-4A)
Liquefied natural gas (LNG) storage [98.232(g)(4,6,7)] (Table W-5A)
LNG import and export equipment [98.232(h)(5,7,8)] (Table W-6A)

Natural gas distribution **[Note: limited to equipment leaks at above grade transmission-distribution transfer stations]** **[98.232(i)(1)] (Table W-7)**

Table Q.3 Natural gas distribution facility activity and emissior
Complete the following table for Natural Gas Distribution facili
Report the leak survey data from above grade T-D transfer stat

NOTE: If you do not have any metering-regulating stations or

Surveyed in calendar year:

Total number of above grade T-D transfer stations surveyed in the calendar year **[98.236(q)(3)(i)]**
Number of meter/regulator runs at above grade T-D transfer stations surveyed in the calendar year, $Count_{MR,y}$ **[98.236(q)(3)(ii)]**
Average time meter/regulator runs surveyed in calendar year were operational, Average of calendar year $T_{w,y}$ (hours) **[98.236(q)(3)(iii)]**

Surveyed in current leak survey cycle:

Number of above grade T-D transfer stations surveyed in current leak survey cycle **[98.236(q)(3)(iv)]**
Number of meter/regulator runs at above grade T-D transfer stations surveyed in current leak survey cycle, Sum of $Count_{MR,y}$ **[98.236(q)(3)(v)]**

Average time that meter/regulator runs surveyed in the current leak survey cycle were operational, Average of current survey $T_{w,y}$ (hours) **[98.236(q)(3)(vi)]**
Meter/regulator run CO_2 emission factor based on all surveyed T-D transfer stations in current leak cycle, Average of current survey $EF_{S,MR,i}$ (standard cubic feet per operational hour of all meter/regulator runs) **[98.236(q)(3)(vii)]**
Meter/regulator run CH_4 emission factor based on all surveyed T-D transfer stations in current leak cycle, Average of current survey $EF_{S,MR,i}$ (standard cubic feet per operational hour of all meter/regulator runs) **[98.236(q)(3)(viii)]**

Surveyed in multiple year leak survey cycle:

Does the facility perform equipment leak surveys across a multiple year leak survey cycle (Yes/No) **[98.236(q)(3)(ix)]**
Total number of meter/regulator runs at above grade T-D station facilities, $Count_{MR}$ **[98.236(q)(3)(ix)(A)]**
Average estimated time that each meter/regulator run at above grade T-D transfer stations was operational in the calendar year, $T_{w,avg}$ (hours) **[98.236(q)(3)(ix)(B)]**
Annual CO_2 emissions from all above grade T-D transfer stations combined (mt CO_2) **[98.236(q)(3)(ix)(C)]**

Annual CH_4 emissions from all above grade T-D transfer stations combined (mt CH_4) [98.236(q)(3)(ix)(D)]

Table R.1 Equipment leaks calculated using population counts Gathering and Boosting only)

If the facility does not have a specified emission source type, enter "0" in column D, $Count_e$ for that row.

Emission Source Type (Eq. W-32A) [98.232(c)(21)] [98.233(r)]
Gas Service - Valves
Gas Service - Connectors
Gas Service - Open ended lines
Gas Service - Pressure relief valves
Light crude service - Valves
Light crude service - Flanges
Light crude service - Connectors
Light crude service - Open ended lines
Light crude service - Pumps
Light crude service - Other equipment leak sources (such as instruments, loading arms, stuffing boxes, compressor seals, dump lever arms, breather caps)
Heavy crude service - Valves
Heavy crude service - Flanges
Heavy crude service - Connectors
Heavy crude service - Open ended lines
Heavy crude service - Other equipment leak sources (such as instruments, loading arms, stuffing boxes, compressor seals, dump lever arms, breather caps)
Gathering pipelines - Protected steel gathering pipeline
Gathering pipelines - Unprotected steel gathering pipeline
Gathering pipelines - Plastic/composite gathering pipeline
Gathering pipelines - Cast iron gathering pipeline

Table R.2 Emissions calculated for component types by popul
Complete the following table for each component type that po

If the facility does not have a specified emission source type, enter

Underground natural gas storage [98.232(f)(5)]
Liquified natural gas (LNG) storage [98.232(g)(3)]
LNG import and export equipment [98.232(h)(4)]
Natural gas distribution [98.232(i)(2)]
Natural gas distribution [98.232(i)(4)]
Natural gas distribution [98.232(i)(5)] **(Distribution main equipment)**
Natural gas distribution [98.232(i)(6)] **(Distribution services equipment)**

Table R.3 Equipment leaks calculated using population counts
NOTE: If you do not have any above grade transmission-distribution (T-D

Number of above grade T-D transfer stations at the facility **[98.236(r)(2)(i)]**
Number of above grade metering-regulating stations that are not T-D transfer stations **[98.236(r)(2)(ii)]**

Total number of meter/regulator runs at above grade metering-regulating stations that are not above grade T-D transfer stations, $Count_{MR}$ **[98.236(r)(2)(iii)]**
Average estimated time that each meter/regulator run at above grade metering-regulating stations that are not above grade T-D transfer stations was operational in the calendar year, $T_{w,avg}$ (hours) **[98.236(r)(2)(iv)]**

If your facility has above grade metering-regulating stations th
your facility also has above grade T-D transfer stations, you m

Annual CO_2 emissions from above grade metering-regulating stations that are not above grade T-D transfer stations (mt CO_2) **[98.236(r)(2)(v)(A)]**
Annual CH_4 emissions from above grade metering-regulating stations that are not above grade T-D transfer stations (mt CH_4) **[98.236(r)(2)(v)(B)]**

Table R.4 Major Equipment Type for which equipment leak emi
Petroleum and Natural Gas Production and Onshore Petroleun

Component count calculation method for all emission source types in Table R.1 other than gathering pipelines **[98.236(r)(3)(i)]**

If the facility does not have a specified Major Equipment Type, enter "No"

Natural gas production and Gathering and boosting equipment (Table W-1B) **[98.236(r)(3)(ii)]**
Crude oil production equipment (Table W-1C) **[98.236(r)(3)(ii)]**

Table QR.1 Missing Data Table

Type of Data **[98.3(c)(8)]** **[98.3(bb)(2)]**
Table Q.2 Emissions calculated for component types using emissions factors

Table R.1 Equipment leaks calculated using population counts and factors (for Onshore Petroleum and Natural Gas Production and Onshore Petroleum and Natural Gas Gathering and Boosting only)

Table R.2 Emissions calculated for component types by population count

Table R.3 Equipment leaks calculated using population counts and factors (for Natural Gas Distribution only)

Table R.4 Major Equipment Type (for Onshore Petroleum and Natural Gas Production and Onshore Petroleum and Natural Gas Gathering and Boosting only)

s [98.236(q,r)]

R.10 | Back to Summary Tab

ıst report data for other emissions from equipment leaks estimated using emission fact

.230(a)(9)]

https://www.epa.gov/ghgreporting/subpart-w-petroleum-and-natural-gas-systems
https://www.ccdsupport.com/confluence/display/help/Optional+Calculation+Spreadshe
https://www.ccdsupport.com/confluence/display/help/Subpart+W+-+Petroleum+and+N
https://www.ccdsupport.com/confluence/display/help/Equipment+Leaks+Surveys+and

Total Other Emissions from Equipment Leaks Estimated Using Em [98.236(q,r)]	
mt CO_2	mt CH_4
0.0	0.00

#N/A

Applicability
Did this facility use leak surveys to calculate emissions from equipment leaks in accordance with 98.232 [per 98.236(q)]?
Did this facility use population counts to calculate emissions from equipment leaks in accordance with 98.232 [per 98.236(r)]?
Are any equipment components at the facility subject to the well site or compressor station fugitive emissions standards under 40 CFR Part 60, Subpart OOOOa [98.236(q)(1)(iii)]?
Did the facility elect to comply with 98.236(q) according to 98.233(q)(1)(iv) for any components at the facility [per 98.236(q)(1)(iv)]?

Best Available Monitoring Methods (BAMM) and Missing

Were BAMM used for any parameters to calculate GHG emissions?	Provide a brief description of the BAMM used, parameter measured, and time period.
BAMM not available for Equipment Leaks	

Applicable table(s) for this industry segment: '0'

Table Q.1	CLICK HERE
Table Q.2.i	CLICK HERE
Table Q.2.ii	CLICK HERE
Table Q.2.iii	CLICK HERE
Table Q.3	CLICK HERE
Table R.1	CLICK HERE
Table R.2	CLICK HERE
Table R.3	CLICK HERE
Table R.4	CLICK HERE
Table QR.1	CLICK HERE

For Natural gas distribution facilities conducting multi-year surveys, number of years in the leak survey cycle [98.236(q)(1)(ii)]	Optical gas imaging instrument as specified in §60.18 [98.234(a)(1)]

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Were Emissions for a Complete Leak Survey Calculated Using Calculation Method 2? (Leaker Measurement Methodology) [98.236(q)(1)(vi)]

g Emissions Factors per Calculation Method 1.
es emission factors for estimating emissions for equipment leaks found in each l

Component Type [98.236(q)(2)(i)]	
Onshore Production or GB Components, Gas Service - Valve	
Onshore Production or GB Components, Gas Service - Flange	
Onshore Production or GB Components, Gas Service - Connector (other)	
Onshore Production or GB Components, Gas Service - Open-Ended Line	
Onshore Production or GB Components, Gas Service - Pressure Relief Valve	
Onshore Production or GB Components, Gas Service - Pump Seal	
Onshore Production or GB Components, Gas Service - Other	
Onshore Production or GB Components, Light Crude Service - Valve	
Onshore Production or GB Components, Light Crude Service - Flange	
Onshore Production or GB Components, Light Crude Service - Connector (other)	
Onshore Production or GB Components, Light Crude Service - Open-Ended Line	
Onshore Production or GB Components, Light Crude Service - Pump	
Onshore Production or GB Components, Light Crude Service - Agitator Seal	
Onshore Production or GB Components, Light Crude Service - Other	
Onshore Production or GB Components, Heavy Crude Service - Valve	
Onshore Production or GB Components, Heavy Crude Service - Flange	
Onshore Production or GB Components, Heavy Crude Service - Connector (other)	
Onshore Production or GB Components, Heavy Crude Service - Open-Ended Line	
Onshore Production or GB Components, Heavy Crude Service - Pump	
Onshore Production or GB Components, Heavy Crude Service - Agitator Seal	
Onshore Production or GB Components, Heavy Crude Service - Other	
Compressor Components, Gas Service - Valve	
Compressor Components, Gas Service - Connector	
Compressor Components, Gas Service - Open-ended Line	
Compressor Components, Gas Service - Pressure Relief Valve	
Compressor Components, Gas Service - Meter	
Non-Compressor Components, Gas Service - Valve	
Non-Compressor Components, Gas Service - Connector	
Non-Compressor Components, Gas Service - Open-ended Line	

Non-Compressor components, Gas Service - Pressure Relief Valve
Non-Compressor components, Gas Service - Meter
Compressor Components, Gas Service - Valve
Compressor Components, Gas Service - Connector
Compressor Components, Gas Service - Open-ended Line
Compressor Components, Gas Service - Pressure Relief Valve
Compressor Components, Gas Service - Meter or Instrument
Compressor Components, Gas Service - Other
Non-Compressor Components, Gas Service - Valve
Non-Compressor Components, Gas Service - Connector
Non-Compressor Components, Gas Service - Open-ended Line
Non-Compressor components, Gas Service - Pressure Relief Valve
Non-Compressor components, Gas Service - Meter or Instrument
Non-Compressor components, Gas Service - Other
Storage Station, Gas Service - Valve
Storage Station, Gas Service - Connector (other)
Storage Station, Gas Service - Open-ended Line
Storage Station, Gas Service - Pressure Relief Valve
Storage Station, Gas Service - Meter and Instrument
Storage Station, Gas Service - Other
Storage Wellheads, Gas Service - Valve
Storage Wellheads, Gas Service - Connector (other than flanges)
Storage Wellheads, Gas Service - Flange
Storage Wellheads, Gas Service - Open-Ended Line
Storage Wellheads, Gas Service - Pressure Relief Valve
Storage Wellheads, Gas Service - Other
LNG Storage, LNG Service - Valve
LNG Storage, LNG Service - Connector
LNG Storage, LNG Service - Pump Seal
LNG Storage, LNG Service - Other
LNG Storage, Gas Service - Valve
LNG Storage, Gas Service - Connector
LNG Storage, Gas Service - Open-Ended Line
LNG Storage, Gas Service - Pressure Relief Valve
LNG Storage, Gas Service - Meter and Instrument
LNG Storage, Gas Service - Other
LNG Terminal, LNG Service - Valve
LNG Terminal, LNG Service - Connector
LNG Terminal, LNG Service - Pump Seal
LNG Terminal, LNG Service - Other
LNG Terminal, Gas Service - Valve
LNG Terminal, Gas Service - Connector
LNG Terminal, Gas Service - Open-ended Line
LNG Terminal, Gas Service - Pressure Relief Valve
LNG Terminal, Gas Service - Meter and Instrument
LNG Terminal, Gas Service - Other

Transmission-Distribution Transfer Station Components, Gas Service - Connector
Transmission-Distribution Transfer Station Components, Gas Service - Block Valve
Transmission-Distribution Transfer Station Components, Gas Service - Control Valve
Transmission-Distribution Transfer Station Components, Gas Service - Pressure Relie
Transmission-Distribution Transfer Station Components, Gas Service - Orifice Meter
Transmission-Distribution Transfer Station Components, Gas Service - Regulator
Transmission-Distribution Transfer Station Components, Gas Service - Open-ended lir

g Direct Measurements per Calculation Method 2.
es direct measurements for equipment leaks found in each leak survey:

Component Type [98.236(q)(2)(i)]
Onshore Production or GB Components, Gas Service - Valve
Onshore Production or GB Components, Gas Service - Flange
Onshore Production or GB Components, Gas Service - Connector (other)
Onshore Production or GB Components, Gas Service - Open-Ended Line
Onshore Production or GB Components, Gas Service - Pressure Relief Valve
Onshore Production or GB Components, Gas Service - Pump Seal
Onshore Production or GB Components, Gas Service - Other
Onshore Production or GB Components, Light Crude Service - Valve
Onshore Production or GB Components, Light Crude Service - Flange
Onshore Production or GB Components, Light Crude Service - Connector (other)
Onshore Production or GB Components, Light Crude Service - Open-Ended Line
Onshore Production or GB Components, Light Crude Service - Pump
Onshore Production or GB Components, Light Crude Service - Agitator Seal
Onshore Production or GB Components, Light Crude Service - Other
Onshore Production or GB Components, Heavy Crude Service - Valve
Onshore Production or GB Components, Heavy Crude Service - Flange
Onshore Production or GB Components, Heavy Crude Service - Connector (other)
Onshore Production or GB Components, Heavy Crude Service - Open-Ended Line
Onshore Production or GB Components, Heavy Crude Service - Pump
Onshore Production or GB Components, Heavy Crude Service - Agitator Seal
Onshore Production or GB Components, Heavy Crude Service - Other
Compressor Components, Gas Service - Valve
Compressor Components, Gas Service - Connector
Compressor Components, Gas Service - Open-ended Line
Compressor Components, Gas Service - Pressure Relief Valve
Compressor Components, Gas Service - Meter
Non-Compressor Components, Gas Service - Valve

Non-Compressor Components, Gas Service - Connector
Non-Compressor Components, Gas Service - Open-ended Line
Non-Compressor components, Gas Service - Pressure Relief Valve
Non-Compressor components, Gas Service - Meter
Compressor Components, Gas Service - Valve
Compressor Components, Gas Service - Connector
Compressor Components, Gas Service - Open-ended Line
Compressor Components, Gas Service - Pressure Relief Valve
Compressor Components, Gas Service - Meter or Instrument
Compressor Components, Gas Service - Other
Non-Compressor Components, Gas Service - Valve
Non-Compressor Components, Gas Service - Connector
Non-Compressor Components, Gas Service - Open-ended Line
Non-Compressor components, Gas Service - Pressure Relief Valve
Non-Compressor components, Gas Service - Meter or Instrument
Non-Compressor components, Gas Service - Other
Storage Station, Gas Service - Valve
Storage Station, Gas Service - Connector (other)
Storage Station, Gas Service - Open-ended Line
Storage Station, Gas Service - Pressure Relief Valve
Storage Station, Gas Service - Meter and Instrument
Storage Station, Gas Service - Other
Storage Wellheads, Gas Service - Valve
Storage Wellheads, Gas Service - Connector (other than flanges)
Storage Wellheads, Gas Service - Flange
Storage Wellheads, Gas Service - Open-Ended Line
Storage Wellheads, Gas Service - Pressure Relief Valve
Storage Wellheads, Gas Service - Other
LNG Storage, LNG Service - Valve
LNG Storage, LNG Service - Connector
LNG Storage, LNG Service - Pump Seal
LNG Storage, LNG Service - Other
LNG Storage, Gas Service - Valve
LNG Storage, Gas Service - Connector
LNG Storage, Gas Service - Open-Ended Line
LNG Storage, Gas Service - Pressure Relief Valve
LNG Storage, Gas Service - Meter and Instrument
LNG Storage, Gas Service - Other
LNG Terminal, LNG Service - Valve
LNG Terminal, LNG Service - Connector
LNG Terminal, LNG Service - Pump Seal
LNG Terminal, LNG Service - Other
LNG Terminal, Gas Service - Valve
LNG Terminal, Gas Service - Connector
LNG Terminal, Gas Service - Open-ended Line
LNG Terminal, Gas Service - Pressure Relief Valve
LNG Terminal, Gas Service - Meter and Instrument

LNG Terminal, Gas Service - Other
Transmission-Distribution Transfer Station Components, Gas Service - Connector
Transmission-Distribution Transfer Station Components, Gas Service - Block Valve
Transmission-Distribution Transfer Station Components, Gas Service - Control Valve
Transmission-Distribution Transfer Station Components, Gas Service - Pressure Relie
Transmission-Distribution Transfer Station Components, Gas Service - Orifice Meter
Transmission-Distribution Transfer Station Components, Gas Service - Regulator
Transmission-Distribution Transfer Station Components, Gas Service - Open-ended lii

ıs

ties with emission sources listed in 98.232(i)(1):

:ions and meter/regulator runs for the calendar year and for the current leak surv

transmission-distribution (T-D) transfer stations, enter zero, do not leave blank.

[redacted]

[redacted]

and factors (for Onshore Petroleum and Natural Gas Production and Onshore P

Geographic Location (according to Table W-1D) [98.236(r)(1)(i)]	Total number of emission source type, $Count_e$ (for gathering pipelines, this value is the number of miles of pipeline per material type) [98.236(r)(1)(ii)]

ation count

pulation counts for estimating emissions for equipment leaks using Equation W-

"0" in column F for that row.

Emission Source Type (Eq. W-32A) [98.232] [98.233(r)(1)]
Storage wellheads, Gas Service - Valves
Storage wellheads, Gas Service - Connector
Storage wellheads, Gas Service - Open-ended line
Storage wellheads, Gas Service - Pressure Relief Valve
LNG Storage Compressor, Gas Service - Vapor Recovery Compressor
LNG Terminals Compressor, Gas Service - Vapor Recovery Compressor
Below Grade T-D Station, Gas Service, Inlet Pressure > 300 psig
Below Grade T-D Station, Gas Service, Inlet Pressure 100 to 300 psig
Below Grade T-D Station, Gas Service, Inlet Pressure < 100 psig
Below Grade M-R Station, Gas Service, Inlet Pressure > 300 psig
Below Grade M-R Station, Gas Service, Inlet Pressure 100 to 300 psig
Below Grade M-R Station, Gas Service, Inlet Pressure < 100 psig
Distribution Mains, Gas Service - Unprotected Steel
Distribution Mains, Gas Service - Protected Steel
Distribution Mains, Gas Service - Plastic
Distribution Mains, Gas Service - Cast Iron
Distribution Services, Gas Service - Unprotected Steel
Distribution Services, Gas Service - Protected Steel
Distribution Services, Gas Service - Plastic
Distribution Services, Gas Service - Copper

and factors (for Natural Gas Distribution only)

) transfer stations or above grade metering-regulating stations that are not T-D stations, enter

at are not above grade T-D transfer stations AND
ust reporting the following emissions

issions are calculated using the methodology in 98.233(r) (for Onshore
n and Natural Gas Gathering and Boosting only)

' in column D for that row.

Major Equipment Type [98.236(r)(3)(ii)]	Equipment type present at facility? [98.236(r)(3)(ii)(A)]
Wellhead	
Separators	
Meters/piping	
Compressors	
In-line heaters	
Dehydrators	
Wellhead	
Separators	
Heater-treater	
Header	

Emission Source Type/ Major Equipment Type	Service Type
[redacted]	

[redacted]

[redacted]

[redacted]

#N/A

:ors:

:et+Instructions
latural+Gas+Systems
+Population+Counts

iission Factors
mt N_2O
N/A

NOTE: Industry segment-speci
applicability questions below a

https://ccdsupport.com/confluenc

If you require additional clarificati

Data

Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]

Leak Survey Characterization
Leak Survey Calculation Method
Emissions Calculated for Component Types Using Emissions Factors per Calculation Methoc
Emissions Calculated for Component Types Using Direct Measurements per Calculation Meth
Natural gas distribution facility activity and emissions
Equipment leaks calculated using population counts and factors
Emissions calculated for component types by population count
Equipment leaks calculated using population counts and factors
Major Equipment Type
For Missing data procedures

Method Used to Conduct Leak Surveys [98.236(q)(1)(v)] Select all that apply		
Method 21 [98.234(a)(2)]	Infrared laser beam illuminated instrument [98.234(a)(3)]	Acoustic leak detection device [98.234(a)(5)]

leak survey:

	Emission Factor Used [98.236(q)(2)(iv)]	Total Number of Components Surveyed by Type [98.236(q)(2)(v)]

[redacted]

[redacted]

f Valve

ne

	Measurement Method Used [98.236(q)(2)(iv)]	Total Number of Components Surveyed by Type [98.236(q)(2)(v)]
	Direct Measurement	
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ef Valve	Direct Measurement
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ne	Direct Measurement

RETURN TO TOP

vey cycle.

etroleum and Natural Gas

RETURN TO TOP

Average estimated time that the emission source type was operational in the calendar year, T_e (hours) [98.236(r)(1)(iii)]	CO_2 Emissions ($mt\ CO_2$) [98.236(r)(1)(iv)]	CH_4 Emissions ($mt\ CH_4$) [98.236(r)(1)(v)]

32A:

	Total number of emission source type, Count$_e$ [98.236(r)(1)(ii)]	Average estimated time that the emission source type was operational in the calendar year, T_e (hours) [98.236(r)(1)(iii)]

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· zero, do not leave blank.

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Count of Major Equipment Type in Eastern US [98.236(r)(3)(ii)(B)]	Count of Major Equipment Type in Western US [98.236(r)(3)(ii)(B)]
[redacted]	[redacted]

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Component Type	Geographic Location	Parameters
[redacted]	[redacted]	[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

11/22/2024

**ific instructions on the expected combinations of responses to the
are available at:**

:e/display/help/Applicability+Options+for+Equipment+Leaks+Surveys+and+

ion, please contact the GHGRP Help Desk at GHGreporting@epa.gov befo

d 1.
hod 2.

Optical gas imaging instrument as specified in §60.5397a [98.234(a)(6)]	Method 21 as specified in §60.5397a [98.234(a)(7)]

Number of Leaks Identified for the Specified Component Type [98.236(q)(2)(vi)]	Average Duration of Leaks for the Specified Component Type (hours) [98.236(q)(2)(vii)]
[redacted]	

[redacted]

[redacted]

Number of Leaks Measured for the Specified Component Type [98.236(q)(2)(vi)]	Average Duration of Leaks for the Specified Component Type (hours) [98.236(q)(2)(vii)]
[redacted]	[redacted]

[redacted]

[redacted]

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CO_2 Emissions (mt CO_2) [98.236(r)(1)(iv)]	CH_4 Emissions (mt CH_4) [98.236(r)(1)(v)]

Calculation Method 1 or Calculation Method 2 Used	Emission Factor or Measurement Method Used
[redacted]	[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

-Population+Counts

re proceeding.

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CO_2 Emissions (Surveyed Components Identified as Leaking Only) (mt CO_2) [98.236(q)(2)(viii)]	CH_4 Emissions (Surveyed Components Identified as Leaking Only) (mt CH_4) [98.236(q)(2)(ix)]
[redacted]	

[redacted]

[redacted]

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CO_2 Emissions (Surveyed Components Identified as Leaking Only) (mt CO_2) [98.236(q)(2)(viii)]	CH_4 Emissions (Surveyed Components Identified as Leaking Only) (mt CH_4) [98.236(q)(2)(ix)]
[redacted]	

[redacted]

[redacted]

Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]
[redacted]		

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Procedures used [98.235(h)]
[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Offshore Petroleum and Natural Gas Production [98.236(s)]

Version R.10

Worksheet Instructions:

SEGMENT DEFINITION:
Offshore petroleum and natural gas production is defined as any platform structure, aff
that processes and/or transfers such hydrocarbons to storage, transport vessels, or on
associated with the platform structure and floating production and storage offloading ec
production platforms. [98.230(a)(1)]

The industry segment consists of both platforms that are under the jurisdiction of the U
and those that are not.

NOTE: BOEM and BSEE replaced the Bureau of Ocean Energy Management, Regula

INSTRUCTIONS:
Offshore production facilities that report to BOEM's emissions inventory must calculate

- Report the same annual emissions as calculated-using the most recent monitoring an
(i)]; or

- If BOEM's emissions reporting system is not available or if the facility does not have t
accordance with paragraph (s)(1)(i), (s)(3), or (s)(4) of this section, as applicable, by us
(ii)]

Offshore production facilities that do not report to BOEM's emissions inventory must ca

- Use the most recent monitoring methods and calculation methodologies published by

- If the facility does not have the data needed to use BOEM's calculation methods, adju
applicable, by using a ratio of the operating time for the facility in the current reporting y

Offshore facilities that are required to report to BOEM's emissions inventory are those
Slope Borough of Alaska. Offshore facilities that are not required to report to BOEM's e
Alaska's North Slope Borough.

Combustion-related emissions (excluding flares) at offshore production facilities are to

https://wwws.ccdsupport.com/confluence/pages/viewpage.action?pageId=107446309

External Links:

Bureau of Ocean Energy Management (BOEM)

Bureau of Safety and Environmental Enforcement (BSEE)

Outer Continental Shelf (OCS) Emissions Inventories

Calculation Spreadsheets

Subpart W Resources Page

Offshore Petroleum and Natural Gas Production Information Sheet

Guidance for Subpart W reporters on Facility Address

Emission Source [98.236(s)]
Amine Unit
Combustion Flares - Light Smoke - No Pilot Fuel-flaring
Combustion Flares - Light Smoke - Pilot Fuel - pilot
Combustion Flares - Light Smoke - Pilot Fuel-flaring
Combustion Flares - Medium Smoke - No Pilot Fuel - flaring
Combustion Flares - Medium Smoke - Pilot Fuel - flaring
Combustion Flares - Medium Smoke - Pilot Fuel - pilot
Combustion Flares - No Smoke - No Pilot Fuel - flaring
Combustion Flares - No Smoke - Pilot Fuel - flaring
Combustion Flares - No Smoke - Pilot Fuel - pilot
Fugitives - Compressor centrifugal dry - gas
Fugitives - Compressor centrifugal dry - NG liq
Fugitives - Compressor centrifugal dry - heavy oil
Fugitives - Compressor centrifugal dry - light oil
Fugitives - Compressor centrifugal dry - oil/water
Fugitives - Compressor centrifugal dry - oil/water/gas
Fugitives - Compressor centrifugal wet - gas
Fugitives - Compressor centrifugal wet - NG liq
Fugitives - Compressor centrifugal wet - heavy oil
Fugitives - Compressor centrifugal wet - light oil
Fugitives - Compressor centrifugal wet - oil/water
Fugitives - Compressor centrifugal wet - oil/water/gas
Fugitives - Compressor reciprocating - gas
Fugitives - Compressor reciprocating - NG liq
Fugitives - Compressor reciprocating - heavy oil
Fugitives - Compressor reciprocating - light oil
Fugitives - Compressor reciprocating - oil/water
Fugitives - Compressor reciprocating - oil/water/gas
Fugitives - Connectors - gas
Fugitives - Connectors - NG liq

Fugitives - Connectors - heavy oil
Fugitives - Connectors - light oil
Fugitives - Connectors - oil/water
Fugitives - Connectors - oil/water/gas
Fugitives - Flanges - gas
Fugitives - Flanges - NG liq
Fugitives - Flanges - heavy oil
Fugitives - Flanges - light oil
Fugitives - Flanges - oil/water
Fugitives - Flanges - oil/water/gas
Fugitives - Open-Ended Lines - gas
Fugitives - Open-Ended Lines - NG liq
Fugitives - Open-Ended Lines - heavy oil
Fugitives - Open-Ended Lines - light oil
Fugitives - Open-Ended Lines - oil/water
Fugitives - Open-Ended Lines - oil/water/gas
Fugitives - Other Equipment - gas
Fugitives - Other Equipment - NG liq
Fugitives - Other Equipment - heavy oil
Fugitives - Other Equipment - light oil
Fugitives - Other Equipment - oil/water
Fugitives - Other Equipment - oil/water/gas
Fugitives - Pumps - gas
Fugitives - Pumps - NG liq
Fugitives - Pumps - heavy oil
Fugitives - Pumps - light oil
Fugitives - Pumps - oil/water
Fugitives - Pumps - oil/water/gas
Fugitives - Valves - gas
Fugitives - Valves - NG liq
Fugitives - Valves - heavy oil
Fugitives - Valves - light oil
Fugitives - Valves - oil/water
Fugitives - Valves - oil/water/gas
Glycol Dehydrator Unit
Losses from Flashing
Mud Degassing - oil-based muds
Mud Degassing - water-based muds
Mud Degassing - synthetic-based muds
Pneumatic Pump
Pressure/Level Controllers
Storage Tank Operations - crude oil
Storage Tank Operations - condensate
Cold Vent

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ixed temporarily or permanently to offshore submerged lands, that houses equipment to extract
shore. In addition, offshore production includes secondary platform structures connected to the p
quipment (FPSO). This industry segment does not include reporting of emissions from offshore d

. S. Department of Interior, Bureau of Ocean Energy Management (BOEM) and the Bureau of Sa

ation and Enforcement (BOEMRE) in October 2011.

and report annual emissions in one of two ways:

d calculation methods published by BOEM referenced in 30 CFR 550.302 through 304 (formerly

he data needed to use BOEM's emissions reporting system, adjust emissions from the facility's r
sing a ratio of the operating time for the facility in the current reporting year relative to the operati

lculate and report annual emissions in one of two ways:

BOEM referenced in 30 CFR 550.302 through 304 to calculate and report annual emissions. [98

ust emissions from the facility's most recent emissions calculated in accordance with paragraph (
year relative to the operating time for that reporting year. [98.233(s)(2)(ii)]

operating in the western Gulf of Mexico Outer Continental Shelf (i.e., west of 87° 30' West longitu
emissions inventory include all other offshore platforms,-such as those located in State waters or

be reported under Subpart C:

https://www.boem.gov/

https://www.bsee.gov/

https://www.boem.gov/environment/environmental-studies/ocs-emissions-inventories

https://www.ccdsupport.com/confluence/display/help/Optional+Calculation+Spreadsheet+Instruc

https://www.epa.gov/ghgreporting/subpart-w-petroleum-and-natural-gas-systems

https://www.epa.gov/ghgreporting/subpart-w-offshore-information-sheet

https://www.ccdsupport.com/confluence/pages/viewpage.action?pageId=218791937 https://www.ccdsupport.com/confluence/display/help/Subpart+W+-+Petroleum+and+Natural+Ga

Total Offshore Source Emissions [98.236(s)]		
mt CO_2	mt CH_4	mt N_2O
0.0	0.00	0.000

mt CO_2 [98.236(s)(1)]	mt CH_4 [98.236(s)(2)]	mt N_2O [98.236(s)(3)]

#N/A

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hydrocarbons from the ocean or lake floor and
latform structure via walkways, storage tanks
rilling and exploration that is not conducted on

afety and Environmental Enforcement (BSEE),

30 CFR 250.302 through 304). [98.233(s)(1)

most recent emissions calculated in
ng time for that reporting year. [98.233(s)(1)

.233(s)(2)(i)]; or

s)(2)(i), (s)(3), or (s)(4) of this section, as

ude) as well as those operating in the North
areas outside of the Gulf of Mexico and

ctions

ıs+Systems

Enhanced Oil Recovery Injection Pumps [98.236(w)]

Version R.10

Worksheet Instructions:	
In accordance with 98.232, only the following industry segment must report data f	
-Onshore petroleum and natural gas production [98.230(a)(2)]	
External Links:	
Subpart W Resources Page	https://www.epa.gov/ghgrepo
Optional Calculation Spreadsheet	https://www.ccdsupport.com/
Help Resources	https://www.ccdsupport.com/

Total Emi
mt CO_2
0.0

Did the facility use CO_2 EC year [
Did any EOR injection p facility during the ca

Best Available

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available

Table W.1 EOR injection pump system characteriz
For Miss

Table W.1 EOR injection pump system characterization and emissions

Sub-Basin ID [98.236(w)(1)]	EOR injection pump system identifier [98.236(w)(2)]

Table W.2 Missing data procedures used for EOR injection pump blowdown

Unique name or ID number	Sub-Basin ID [98.236(w)(1)]
[redacted]	

[redacted]

#N/A

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ʻor EOR injection pump blowdown:

ırting/subpart-w-petroleum-and-natural-gas-systems
confluence/display/help/Optional+Calculation+Spreadsheet+Instructions
confluence/display/help/Subpart+W+-+Petroleum+and+Natural+Gas+Systems

ssions for EOR Injection Pump Blowdown [98.236(w)]	
mt CH_4	**mt N_2O**
N/A	N/A

Applicability	
DR injection during the calendar 98.236(w)]?	
ɒump blowdowns occur at the alendar year [98.236(w)]?	

Monitoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	**Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]**
ꜝ for EOR Injection Pumps	

ation and emissions [Table W.1]:	**CLICK HERE**
ꜝing data procedures [Table W.2]:	**CLICK HERE**

Pump capacity (barrels per day) [98.236(w)(3)]	Total volume of EOR injection pump system equipment chambers, V_v (cubic feet) [98.236(w)(4)]	Number of blowdowns per year [98.236(w)(5)]

calculations

Parameters	Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]

[redacted]

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Density of critical phase EOR injection gas, R_c (kg/ft^3) [98.236(w)(6)]	Mass fraction of CO_2 in critical phase EOR injection gas, GHG_{CO2} [98.236(w)(7)]	CO_2 emissions (mt CO_2) [98.236(w)(8)]

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Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]	Procedures used [98.235(h)]

[redacted]

EOR Hydrocarbon Liquids [98.236(x)]

Version R.10

Worksheet Instructions:	
In accordance with 98.232, only the following industry segment must report data f	
-Onshore petroleum and natural gas production [98.230(a)(2)]	

External Links:	
Subpart W Resources Page	https://www.epa.gov/ghgrepo
Optional Calculation Spreadsheet	https://www.ccdsupport.com/
Help Resources	https://www.ccdsupport.com/

Total Emissior
mt CO_2
0.0

Did the facility have hydro from enhanced oil recove under 98

Best Available

Were BAMM used for any parameters to calculate GHG emissions?
BAMM not available

Table X.1. EOR hydrocarbon liquids For

Table X.1 EOR hydrocarbon liquids produced and emissions

Sub-Basin ID [98.236(x)(1)]	Volume of hydrocarbon liquid produced, V_{hl} (barrels per year) [98.236](x)(2)]

Table X.2 Missing data procedures used for EOR hydrocarbon liquids disso

Sub-basin ID	Parameters
[redacted]	

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'or EOR hydrocarbon liquids dissolved CO2:

ırting/subpart-w-petroleum-and-natural-gas-systems
confluence/display/help/Optional+Calculation+Spreadsheet+Instructions
confluence/display/help/Subpart+W+-+Petroleum+and+Natural+Gas+Systems

ıs for EOR Hydrocarbon Liquids Dissolved CO_2 [98.236(x)]	
mt CH_4	mt N_2O
N/A	N/A

Applicability	
ɔcarbon liquids that were produced ɛry operations subject to reporting 3.232 [98.236(x)]?	

Monitoring Methods (BAMM) and Missing Data

Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
for EOR Hydrocarbon Liquids	

produced and emissions [Table X.1]:	CLICK HERE
Missing data procedures [Table X.2]:	CLICK HERE

Average CO_2 retained in hydrocarbon liquids downstream of the storage tank, S_{hl} (mt CO_2 per barrel) [98.236(x)(3)]	Annual CO_2 emissions retained, $Mass_{CO2}$ (mt CO_2) [98.236(x)(4)]

lved CO_2 calculations

Measurement Frequency	Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]
[redacted]		

#N/A

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Procedures used [98.235(h)]
[redacted]

Combustion Equipment at Onshore Petroleum
Boosting Facilities, and Natural gas Distributio

Version

Worksheet Instructions:
In accordance with 98.232, only the following industry segment r
-Onshore petroleum and natural gas production [98.230(a)(2)
-Natural gas distribution [98.230(a)(8)]
-Onshore petroleum and natural gas gathering and boosting
External Links:
Subpart W Resources Page
Optional Calculation Spreadsheet
Help Resources

External combustion units with a he

External combustic

Table Z.1 External combustion units with a heat capacity eq

Internal combustion units equal to or less than 1 mmBtu/hr

Are there external fuel combustion units with a rated heat capacity less than or equal to 5 mmBtu/hr? [98.236(z)(1)(i)]
Are there internal fuel combustion units that are not compressor-drivers, with a rated heat capacity less than or equal to 1 mmBtu/hr? [98.236(z)(1)(i)]
Total number of combustion units meeting 98.236(z)(1) descriptions

Table Z.2 External combustion units with a heat capacity gr combustion units greater than 1 mmBtu/hr

Are there external fuel combustion units with a rated heat capacity greater than 5 mmBtu/hr? [98.236(z)(2)(i)]
Are there internal fuel combustion units that are not compressor-drivers, with a rated heat capacity greater than 1 mmBtu/hr? [98.236(z)(2)(i)]
Are there Internal fuel combustion units of any heat capacity that are compressor-drivers? [98.236(z)(2)(i)]

Table Z.3 Large combustion unit emissions

If you answered "Yes" to any part of Table Z.2, complete Ta

Type of combustion unit [98.236(z)(2)(i)]

[redacted]

[redacted]

Table Z.4 Missing data procedures used for Combustion En

Type of combustion unit
[redacted]

and Natural Gas Production Facilities, Onshore Petroleum and Natura
n Facilities [98.236(z)]

R.10 | Back to Summary Tab

nust report data for combustion emissions:

)]

[98.230(a)(9)]

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https://www.ccdsupport.com/confluence/display/help/Optional+Calculation+Spreadsheet+Instruc

https://www.ccdsupport.com/confluence/display/help/Subpart+W+-+Petroleum+and+Natural+Ga

Total Combustion Emissions [98.236(z)]		
mt CO_2	mt CH_4	mt N_2O
0.0	0.00	0.000

Applicability	
Did the facility have combustion units subject to reporting under 98.232?	

Best Available Monitoring Methods (BAMM) and Missing Data

Were BAMM used for any parameters to calculate GHG emissions?	Provide a brief description of the BAMM used, parameter measured, and time period.	Were missing data procedures used for any parameters to calculate GHG emissions? [98.235]
BAMM not available for Combustion Equipment		

eat capacity equal to or less than 5 mmBtu/hr or Internal combustion units equal to or less

on units with a heat capacity greater than 5 mmBtu/hr or Internal combustion units greater

Large combusti

For Missing

ual to or less than 5 mmBtu/hr or

eater than 5 mmBtu/hr or Internal

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ble Z.3 for all applicable units.

Type of fuel combusted [98.236(z)(2)(ii)]	Quantity of fuel combusted in calendar year [98.236(z)(2)(iii)]	Unit of measure [98.236(z)(2)(iii)]

[redacted]

[redacted]

ission calculations

Type of fuel combusted	Parameters	Measurement Frequency
[redacted]		

l Gas Gathering and

#N/A

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ctions as+Systems

s than 1 mmBtu/hr [Table Z.1]:	CLICK HERE
r than 1 mmBtu/hr [Table Z.2]:	CLICK HERE
on unit emissions [Table Z.3]:	CLICK HERE
g data procedures [Table Z.4]:	CLICK HERE

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CO_2 Emissions (mt CO_2) [98.236(z)(2)(iv)]	CH_4 Emissions (mt CH_4) [98.236(z)(2)(v)]	N_2O Emissions (mt N_2O) [98.236(z)(2)(vi)]
[redacted]		

[redacted]

[redacted]

Number of quarters missing data procedures were used [98.236(bb)(1)]	Total number of hours in the year missing data procedure was used [98.3(c)(8)] [98.236(bb)(2)]	P
[redacted]		

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Procedures used

[98.235(h)]

[redacted]