Table of Contents

Air Title V Operating Permit (AOP) - Renewal

version 2.5

(Submission #: HQB-0MG5-V1J47, version 2)

Details

Submission ID HQB-0MG5-V1J47

Status In Process

Form Input

Form Instructions

In accordance with 33.1-15-14-04.c. of the North Dakota Air Pollution Control Rules, a Title V permit renewal application must be submitted to the Department at least six months, but no more than eighteen months, prior to the expiration date. Permit renewal applications are incomplete unless all information requested in SFN 52824 is supplied. The current Title V permit will be the baseline reference for a renewal. The requirements (40 CFR 70.5(c) & NDAC 33.1-15-14-06.4.c) to include a citation and description of all applicable requirements and a description of or reference to any applicable test method for determining compliance with each applicable requirement may be met by accomplishing either or both of the following: 1) provide an annotated (red-lined) copy of the current permit indicating all changes needed to reflect the current facility configuration, applicable requirements and test methods; 2) provide a narrative that conveys all changes needed to the current permit to reflect the current facility configuration, all applicable requirements and test methods.

FOR ACID RAIN UNITS ONLY • Submit with the Title V permit renewal application all Acid Rain renewal applications (the Acid Rain Permit Application, the Phase II NOx Compliance Plan, and if applicable, the Phase II NOx Averaging Plan).

When completing the online application, if uploaded files are provided in each section (when indicated), do not include those same files in the General Document Upload/File Upload section. If uploading the application files in the General Document Upload/File Upload section, only fill out the required (asterisked) sections of the online application.

Section A - Permit Information

Permit Number
AOP-28417

Permit Version
1

Issue Date
09/22/2020

Expiration Date
09/22/2025

Permittee

Company Name
Hess North Dakota Pipelines LLC

Address

10384 - 68th St NW

Tioga, ND 58852-0459

United States

Responsible Official

Prefix
Mr.

First Name	Last Name
Charles	Tack

Title
Director of Midstream Operations

Phone Type	Number	Extension
Business	7016646221	

Email
kashif.malik@hess.com

Address
1501 Mckinney St
Houston, ND 77010
United States

Contact Person for Air Pollution Matters

Prefix
Mr.

First Name	Last Name
Kashif	Malik

Title
NONE PROVIDED

Phone Type	Number	Extension
Business	7134964054	

Email
kashif.malik@hess.com

Address
1501 Mckinney St
Houston, ND 77010
United States

Section B (Part 1) - Facility Information

Facility Name
Hess North Dakota Pipelines LLC - Hawkeye Gas Facility

Have you added, removed, or made any modifications to equipment since your last operating permit issuance?
No

Is this source subject to Title IV Acid Rain regulations?
No

Is this a portable source?
No

Facility Location
NW 1/4, NW 1/4, Sec. 35, T153N, R95W
Charlson, ND 58763
United States

County
McKenzie

Facility Location:
48.03762300000000,-102.8679920000000

NW 1/4, NW 1/4, Sec. 35, T153N, R95W, Charlson, ND

Section B (Part 2) - Additional Location Information

Legal Description of Facility Site

Qtr Qtr	Qtr	Section	Township	Range
NW	NW	35	153N	95W

Land area at facility site (indicate whether measurement is in acres or sq. ft.)
NONE PROVIDED

MSL elevation at facility
NONE PROVIDED

Section C - Nature of Business

General Nature of Business

Describe Nature of Business	NAICS Code	SIC Code
Compressor Station	211130-Natural Gas Extraction	1311

Actual Start of Construction Date
NONE PROVIDED

Actual End of Construction Date
NONE PROVIDED

Facility Startup Date
NONE PROVIDED

Section D - Process Equipment Information (1 of 1)

Emission Unit -

Emission Unit ID
NONE PROVIDED

Emission Unit Description
NONE PROVIDED

Emission Point ID
NONE PROVIDED

Emission Point Description
NONE PROVIDED

Emission Process Description
NONE PROVIDED

Emission Unit Status
NONE PROVIDED

Applicable PTCs

PTC Number

Applicable Federal Air Programs

Program Code

Applicable State Regulations

Regulation

Emission Unit form

Download the emission unit form linked here, complete it, and upload it to this application using the attachment control below.

When completing the online application, if uploaded files are provided in each section (when indicated), do not include those same files in the General Document Upload/File Upload section. If uploading the application files in the General Document Upload/File Upload section, only fill out the required (asterisked) sections of the online application.
EMISSION UNIT FOR TITLE V PERMIT TO OPERATE (SFN61006)

Attach Emission Unit Form

Renewal Form SFN52824 signed 3.21.25.pdf - 03/21/2025 11:44 AM

Comment

NONE PROVIDED

Section F - Facility-Wide Applicable Regulations and Potential to Emit (PTE)

Applicable Federal Air Programs

Program Code
Title V Permits

Applicable State Regulations

Regulation
33.1-15-02-04. Ambient air quality standards.

Potential to Emit (PTE)

Pollutant	Tons Per Year Without Fugitives	Tons Per Year With Fugitives
NOx	113.87	113.87
CO	115.31	115.31
VOCs	126.01	153.36
SO2	0.94	0.94
PM	8.00	8.00
PM10	8.00	8.00
PM2.5	8.00	8.00
Total HAPs	18.05	21.10

Emission Calculations Document Upload

Using the attachment control below, upload emission calculations documents.

When completing the online application, if uploaded files are provided in each section (when indicated), do not include those same files in the General Document Upload/File Upload section. If uploading the application files in the General Document Upload/File Upload section, only fill out the required (asterisked) sections of the online application.

Attach Emission Calculations Documents

Hawkeye Emissions Calculation PTE.pdf - 03/31/2025 02:12 PM

Comment

NONE PROVIDED

Section G - Compliance Schedule

Will your facility be in compliance with all applicable requirements effective at the time of permit issuance?
Yes

Will your facility be in compliance with all applicable requirements effective after the time of permit issuance?
Yes

Section H - Flexible Permits

Are you requesting a flexible permit?
No

Section I - Compliance Assurance Monitoring (CAM)

To determine if your facility is subject to CAM, review the information provided at the following link.
Compliance Assurance Monitoring (CAM) Guidance

Is the facility identified in this application in compliance with applicable monitoring and compliance certification requirements?
Yes, the facility IS in compliance with applicable monitoring and compliance certification requirements.

Section K - Redline Permit Upload

Use the attachment control below to upload a redline version of your existing permit document, showing any changes.

When completing the online application, if uploaded files are provided in each section (when indicated), do not include those same files in the General Document Upload/File Upload section. If uploading the application files in the General Document Upload/File Upload section, only fill out the required (asterisked) sections of the online application.

Attach redline version of permit here
Hawkeye Title V Renewal Application.pdf - 03/31/2025 02:11 PM
Comment
NONE PROVIDED

Section L - General Document Upload

File Upload

Use the attachment control below to upload any other information necessary for application review, such as plot plans, process diagrams, maps, etc.

When completing the online application, if uploaded files are provided in each section (when indicated), do not include those same files in the General Document Upload/File Upload section. If uploading the application files in the General Document Upload/File Upload section, only fill out the required (asterisked) sections of the online application.

Attachments
NONE PROVIDED
Comment
NONE PROVIDED

Additional Forms
NONE PROVIDED

Attachments

Date	Attachment Name	Context	User
3/31/2025 2:12 PM	Hawkeye Emissions Calculation PTE.pdf	Attachment	Kashif Malik
3/31/2025 2:11 PM	Hawkeye Title V Renewal Application.pdf	Attachment	Kashif Malik

Date	Attachment Name	Context	User
3/21/2025 11:44 AM	Renewal Form SFN52824 signed 3.21.25.pdf	Attachment	Kashif Malik

Status History

	User	Processing Status
3/31/2025 2:07:17 PM	Kashif Malik	Draft
3/31/2025 2:14:22 PM	Kashif Malik	Signing
3/31/2025 2:14:23 PM	Kashif Malik	Submitting
3/31/2025 2:15:54 PM	Kashif Malik	Submitted
3/31/2025 2:16:02 PM	Kashif Malik	In Process

Audit

Event	Event Description	Event By	Event Date
Submission Locked	Submission Locked	Schneider, Kyla K.	3/28/2025 1:35 PM
Submission Unlocked	Submission Unlocked	Schneider, Kyla K.	3/28/2025 1:47 PM
Submission Locked	Submission Locked	Schneider, Kyla K.	4/1/2025 12:23 PM

Revisions

Revision	Revision Date	Revision By
Revision 1	3/11/2025 8:53 AM	Kashif Malik
Revision 2	3/31/2025 2:07 PM	Kashif Malik

Agreements and Signature(s)

SUBMISSION AGREEMENTS

- ☑ I am the owner of the account used to perform the electronic submission and signature.
- ☑ I have the authority to submit the data on behalf of the facility I am representing.
- ☑ I agree that providing the account credentials to sign the submission document constitutes an electronic signature equivalent to my written signature.
- ☑ I have reviewed the electronic form being submitted in its entirety, and agree to the validity and accuracy of the information contained within it to the best of my knowledge.

I certify under penalty of law that the enclosed documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I also certify that the source(s) identified in this application is/are in compliance with all applicable requirements except those requirements for which a compliance schedule has been submitted in the Compliance Schedule Form or Compliance Schedule Section of the application . I understand that failure to comply with any term of a compliance schedule is considered to be a violation of regulation NDAC 33.1-15-14-06.1.e. The source will continue to comply with the current applicable requirements with which it is in compliance. The source will meet, on a timely basis, any applicable requirement, which becomes effective during the permit term. The source is properly implementing any required risk management plan in accordance with section 112(r) of the federal clean air act, if appropriate.

I certify, as the Responsible Official, that I have read and understood the above requirements and conditions applicable to my source/facility and that the information and attachments provided in this application are true, accurate, and complete to the best of my knowledge." Further, I agree to comply with the provisions of Chapter 23.1-06 of the North Dakota Century Code and all rules and regulations of the Department, or revisions thereof. I also understand a permit is nontransferable and, if granted a permit, I will promptly notify the Department upon sale or legal transfer of this permitted establishment.

Note: This certification must be signed by a "responsible official" as defined in NDAC 33.1-15-14-06.1.

Signed By Kashif Malik on 03/31/2025 at 2:14 PM

March 20, 2025

Mr. David Stroh
North Dakota Department of Environmental Quality
4201 Normandy Street
Bismarck, ND 58503

Re: Title V Renewal Application
Hawkeye Gas Facility

Dear Mr. Stroh,

Hess North Dakota Pipeline LLC ("Hess") owns and operates the Hawkeye Gas Facility in McKenzie County, North Dakota. Emission sources at Hawkeye Gas Facility are authorized under Permit to Construct (PTC) 14080. The facility operates under Title V permit AOP-28417 v1.0 which was issued by NDDEQ on September 25, 2020.

Pursuant to Section 33.1-15-14-06.6c of the North Dakota Air Pollution Control Rules, a Title V permit renewal application must be submitted to the Department at least six months, but no more than eighteen months, before the expiration date.

Hess hereby submits a renewal application for Hawkeye Gas Facility Title V permit AOP-28417. Appendix A of the application includes a summary of applicable federal and state rule applicability. Appendix B includes the Potential to Emit emission calculations and Appendix C includes the applicable Title V permit application forms.

As part of this renewal application, Hess is updating the emission unit name, emission unit description, and emission point name for the following sources in the Title V permit:

Old Emission Unit Name	New Emission Unit Name	New Emission Unit Description	Old Emission Point Name	New Emission Point Name
CE-1	REFRIG # 1	Refrigeration Compressor #1 Engine	1	S-758435
CE-2	REFRIG # 2	Refrigeration Compressor #2 Engine	2	S-758535
CE-3	FLASH # 3	Flash Gas Compressor #3 Engine	3	S-758335
CE-4	FLASH # 1	Flash Gas Compressor #1 Engine	4	S-758135

Old Emission Unit Name	New Emission Unit Name	New Emission Unit Description	Old Emission Point Name	New Emission Point Name
CE-5	FLASH # 2	Flash Gas Compressor #2 Engine	5	S-758235
CE-6	INLET # 4	Inlet Gas Compressor #4 Engine	6	S-752435
CE-7	INLET # 5	Inlet Gas Compressor #5 Engine	7	S-752535
CE-8	INLET # 1	Inlet Gas Compressor #1 Engine	8	S-752135
CE-9	INLET # 2	Inlet Gas Compressor #2 Engine	9	S-752235
CE-10	INLET # 3	Inlet Gas Compressor #3 Engine	10	S-752335
BH-11	H-756125	Building Heater #1	11	H-756125
BH-12	H-756325	Building Heater #3	12	H-756325
BH-13	H-756225	Building Heater #2	13	H-756225
LH-14	H-756011	FG Line Heater	14	H-756011
GH-15	D-754005	EG Reboiler/Heater	15	D-754005
IC-16	EG-DHYUNIT	Ethylene Glycol Dehydration Unit	16	TO
FL-17	FLARE	Process/Emergency Flare (S-755004)	17	FLARE
ST-18	SLOPST	Slop Storage Tanks (TK-751115)	18	TO
ST-19	SLOPST	Slop Storage Tanks (TK-751215)	19	TO
ST-20	OILST	Oil Storage Tank TK-751119	20	TO
ST-21	OILST	Oil Storage Tank TK-751219	21	TO
ST-22	WTRST	Water Storage Tank (TK-751006)	22	TO
EG-23	EMGGENENG1	Standby Generator Emergency Engine #1	23	EG-23
EG-24	EMGGENENG1	Standby Generator Emergency Engine 2	24	EG-24

In addition to renaming emission sources, Hess request the following new emission sources to be added to the Title V permit:

Emission Unit Name	Emission Unit Description	Emission Point Name
MeOHST	Methanol Storage Tank (TK-756001)	MeOHST
LOADCOND	Truck Loading - Condensate	LOADCOND
LOADPRDWTR	Truck Loading - Produced Water	LOADPRDWTR
FUG	Fugitives	FUG

Hess will also be submitting a revision to the Permit to Construct (PTC14089) with the revised Potential to Emit emission calculation and incorporation of emission sources in the table above.

Please contact me at (832) 690-6990 or kashif.malik@hess.com, if you have any questions or need additional information on this permit application.

Sincerely,
HESS Corporation

Kashif Malik

Advisor EHS
Environment & Regulatory

Appendix A

Federal Rule Applicability

Operations at Hawkeye Gas Facility are consistent with the goal of protecting the public health, welfare, and physical property of the people, as outlined below.

NSPS - NDAC § 33.1-15-12

Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels

Slop Storage Tanks (TK-751115 & TK-751215), Oil Storage Tanks (TK-751119 & TK-751219), Water Storage Tank (TK-751006), and Methanol Storage Tank (TK-756001) commenced construction after July 23, 1984, and before October 4, 2023. These storage tanks have storage capacities of less than 75 m^3 (19,800 gallons). Therefore, the provision of NSPS Kb does not apply to these storage tanks.

Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

Inlet Gas Compressor Engines (1-5), Flash Gas Compressor Engines (1-3), and Refrigeration Compressor Engines (1-2) commence construction after July 1, 2008, and will be subject to the applicable requirement of NSPS JJJJ.

The two emergency generator engines (1-2) commence construction after January 1, 2009, and will be subject to the applicable requirement of NSPS JJJJ. Hawkeye will comply with §60.4243(d) for the generator engines to be considered emergency engines.

Subpart OOOO: Crude Oil and Natural Gas Facilities for which Construction, Modification, or Reconstruction Commenced After August 23, 2011, and on or Before September 18, 2015

Hawkeye Gas Facility has ten reciprocating compressors that were constructed after August 23, 2011, and on or before September 18, 2025, and will be subject to NSPS OOOO applicable requirements for reciprocating compressor affected facility.

The Hawkeye Gas Facility includes two slop storage tanks and oil storage tanks, Water Storage Tank, and Methanol Storage Tank. Each of these storage tanks has the potential VOC emissions of less than 6 tons per year without any control and will not be a storage tank affected facility under §60.5365(e). In addition, the vapors from these storage tanks are recovered and routed back to the process through a vapor recovery unit (VRU). The thermal oxidizer (TO) is a backup control device for the VRU (PK-753101).

NESHAP - NDAC § 33.1-15-13

There are no facilities addressed in this application that are subject to these regulations.

NESHAPS for Source Categories - NDAC § 33.1-15-22

Subpart HH-National Emissions Standards for Hazardous Air Pollutants for Oil and Natural Gas Production Facilities

MACT Subpart HH applies to emission points at oil and natural gas production facilities that are major or area sources of hazardous air pollutants (HAP) that process, upgrade, or store either hydrocarbon liquids or natural gas before the point at which natural gas enters the natural gas transmission and storage source category or is delivered to an end user.

The Hawkeye Gas Facility is an area source of HAP and includes ethylene glycol dehydration unit and storage vessels with potential flash emissions.

According to §63.670(b)(2) for area sources, the affected source includes each tri-ethylene glycol (TEG) dehydration unit located at an oil and natural gas production facility. Since Hawkeye Gas Facility is an area source of HAP and includes an ethylene glycol (EG) dehydration unit, it is not an affected facility and MACT HH provisions do not apply. In addition, the glycol dehydrator unit reboiler vents to a thermal vapor incinerator (TO) with controlled benzene emissions of less than 0.90 megagrams per year.

The storage tank VOC flash emissions, in addition to the standing, working and breathing losses are controlled by a vapor recovery unit with the thermal vapor incinerator as a backup. Storage vessels at the Hawkeye Gas Facility are not an affected source under MACT HH because the facility is an area source of HAP.

Subpart ZZZZ—National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)

Inlet Gas Compressor Engines (1-5), Flash Gas Compressor Engines (1-3), Refrigeration Compressor Engines (1-2), and Emergency Generator Engines (1-2) are considered new stationary RICE located at an area source that commenced construction after June 12, 2006. According to §63.6590(c) new or reconstructed stationary RICE at an area source meets the requirement of MACT ZZZZ by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines.

The engines at the Hawkeye Gas Facility are subject to NSPS Subpart JJJJ. These new stationary RICE located at an area source meet the requirements of the RICE MACT by meeting the requirement of NSPS Subpart JJJJ. No further requirements apply for engines under this part.

State Rule Applicability

NDAC § 33.1-15-03 - Restrictions of Emission of Visible Air Contaminants.

Each of the combustion sources at the Hawkeye Gas Facility complies with the opacity limit of twenty percent except that a maximum of forty percent opacity is permissible for not more than one six-minute period per hour.

The Process/Emergency Flare at the Hawkeye Gas Facility complies with the opacity limit of twenty percent except that a maximum of sixty percent opacity is permissible for not more than one six-minute period per hour.

NDAC § 33.1-15-07 - Control of Organic Compounds Emissions

Slop Storage Tanks (TK-751115 & TK-751215), Oil Storage Tanks (TK-751119 & TK-751219), Water Storage Tank (TK-751006), and Methanol Storage Tank (TK-756001) have capacities greater than one thousand (1,000) gallons and are equipped with a submerged fill pipe during filling operations.

Loading facilities at Hawkeye Gas Facility handle less than twenty thousand gallons per day and do not have to meet emissions control requirements under this section.

The Process/Emergency Flare at the Hawkeye Gas Facility is equipped and operated with an automatic igniter or a continuously burning pilot.

NDAC § 33.1-15-08 - Control of Air Pollution from Vehicles and Other Internal Combustion Engines

The natural gas-fired engines at the Hawkeye Gas Facility operate in compliance with this requirement in this chapter.

NDAC § 33.1-15-17 - Restriction of Fugitive Emissions

The Hawkeye Gas Facility operates in compliance with this requirement in this chapter.

Appendix B

Potential to Emit Calculation

Company: Hess North Dakota Pipelines LLC
Unit or Station: Hawkeye Gas Facility

Emission Unit	Emission Unit Description	Emission Point	PM	PM10	PM2.5	SO2	NOX	CO	VOC
REFRIG # 1	Refrigeration Compressor #1 Engine	S-758435	0.57	0.57	0.57	0.03	6.66	2.26	3.20
REFRIG # 2	Refrigeration Compressor #2 Engine	S-758535	0.57	0.57	0.57	0.03	6.66	2.26	3.20
FLASH # 3	Flash Gas Compressor #3 Engine	S-758335	0.16	0.16	0.16	0.01	3.86	3.86	1.39
FLASH # 1	Flash Gas Compressor #1 Engine	S-758135	0.29	0.29	0.29	0.02	3.33	1.20	1.86
FLASH # 2	Flash Gas Compressor #2 Engine	S-758235	0.29	0.29	0.29	0.02	3.33	1.20	1.86
INLET # 4	Inlet Gas Compressor #4 Engine	S-752435	0.66	0.66	0.66	0.04	8.56	3.25	5.48
INLET # 5	Inlet Gas Compressor #5 Engine	S-752535	0.66	0.66	0.66	0.04	8.56	3.25	5.48
INLET # 1	Inlet Gas Compressor #1 Engine	S-752135	1.32	1.32	1.32	0.08	17.12	6.51	10.96
INLET # 2	Inlet Gas Compressor #2 Engine	S-752235	1.32	1.32	1.32	0.08	17.12	6.51	10.96
INLET # 3	Inlet Gas Compressor #3 Engine	S-752335	1.32	1.32	1.32	0.08	17.12	6.51	10.96
EMGGENENG1	Standby Generator Emergency Engine #1	EMGGENENG1	0.01	0.01	0.01	0.0004	0.37	0.74	0.19
EMGGENENG2	Standby Generator Emergency Engine #2	EMGGENENG2	0.01	0.01	0.01	0.0004	0.37	0.74	0.19
H-756125	Building Heater #1	H-756125	0.08	0.08	0.08	0.01	1.03	0.87	0.06
H-756325	Building Heater #3	H-756325	0.08	0.08	0.08	0.01	1.03	0.87	0.06
H-756225	Building Heater #2	H-756225	0.15	0.15	0.15	0.01	1.93	1.62	0.11
H-756011	FG Line Heater	H-756011	0.04	0.04	0.04	0.003	0.54	0.45	0.03
D-754005	EG Reboiler/Heater	D-754005	0.05	0.05	0.05	0.004	0.64	0.54	0.04
EG-DHYUNIT	Ethylene Glycol Dehydration Unit	TO	0.13	0.13	0.13	0.030	1.19	5.87	0.96
TO	Thermal Oxidizer	TO	0.30	0.30	0.30	0.033	2.68	13.22	0.14

Potential to Emit Calculation

Company: Hess North Dakota Pipelines LLC
Unit or Station: Hawkeye Gas Facility

Emission Unit	Emission Unit Description	Emission Point	PM	PM10	PM2.5	SO2	NOX	CO	VOC
SLOPST	Slop Storage Tanks (TK-751115 & TK-751215)	VRU TO	-	-	-	-	-	-	0.22
OILST	Oil Storage Tank (TK-751119 & TK-751219)	VRU TO							
WTRST	Water Storage Tank (TK-751006)	VRU TO							
MeOHST	Methanol Storage Tank (TK-756001)	VRU TO							
LOADCOND	Truck Loading - Condensate	LOADCOND	-	-	-	-	-	-	0.15
LOADPRDWTR	Truck Loading - Produced Water	LOADPRDWTR	-	-	-	-	-	-	0.03
FUG	Fugitives	FUG	-	-	-	-	-	-	27.65
FLARE	Process/ Emergency Flare (S-755004)	FLARE	-	-	-	0.42	11.76	53.59	68.21
Total Facility Emissions (Including HAPS)			8.00	8.00	8.00	0.94	113.87	115.31	153.36

Potential to Emit Calculation

Company: Hess North Dakota Pipelines LLC
Unit or Station: Hawkeye Gas Facility

Hazardous Air Pollutant (HAP)										
Emission Unit	**Emission Point**	**Formaldehyde**	**Acetaldehyde**	**Acrolein**	**Benzene**	**Methanol**	**Hexane**	**Toluene**	**Xylene**	**Octanes**
REFRIG # 1	S-758435	0.22	0.09	0.16	0.03	0.01	0.14	0.02	0.01	-
REFRIG # 2	S-758535	0.29	0.19	0.02	0.03	0.01	0.004	0.02	0.01	-
FLASH # 3	S-758335	0.22	0.05	0.04	0.03	0.05	0.00	0.01	0.003	-
FLASH # 1	S-758135	0.01	0.07	0.031	0.013	0.004	0.013	0.01	0.01	-
FLASH # 2	S-758235	0.30	0.08	0.004	0.013	0.009	0.63	0.01	0.01	-
INLET # 4	S-752435	1.62	0.22	0.04	0.03	0.04	0.08	0.03	0.01	-
INLET # 5	S-752535	1.36	0.18	0.11	0.03	0.01	0.11	0.03	0.01	-
INLET # 1	S-752135	0.83	0.53	0.004	0.06	0.004	0.004	0.05	0.02	-
INLET # 2	S-752235	2.19	0.04	0.33	0.06	0.004	0.05	0.05	0.02	-
INLET # 3	S-752335	1.93	0.35	0.03	0.06	0.03	0.14	0.05	0.02	-
EMGGENENG1	EMGGENENG1	0.01	0.002	0.002	0.001	0.002	0.00	0.00	0.00	-
EMGGENENG2	EMGGENENG2	0.01	0.002	0.002	0.001	0.002	0.00	0.00	0.00	-
H-756125	H-756125	0.001	0.00	0.00	0.00	0.00	0.02	0.00	0.00	-
H-756325	H-756325	0.001	0.00	0.00	0.00	0.00	0.02	0.00	0.00	-
H-756225	H-756225	0.001	0.00	0.00	0.00	0.00	0.03	0.00	0.00	-
H-756011	H-756011	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	-
D-754005	D-754005	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	-
TO	TO	-	-	-	0.13	0.001	0.03	0.02	-	-
S-755004	S-755004	-	-	-	0.26	-	2.45	0.24	0.45	0.68
FUG	FUG	-	-	-	0.02	2.74	0.28	0.004	0.003	0.003
Total HAP	21.10	8.99	1.79	0.79	0.75	2.92	4.02	0.56	0.58	0.68

Engines
Potential to Emit Calculation

	SEC 35-153-95	SEC 35-153-95	SEC 35-153-95	SEC 35-153-95	SEC 35-153-95	SEC 35-153-95
COUNTY	**McKENZIE CO. ND HAWKEYE**	**McKENZIE CO. ND HAWKEYE**	**McKENZIE CO. ND HAWKEYE**	**McKENZIE CO. ND HAWKEYE**	**McKENZIE CO. ND HAWKEYE**	**McKENZIE CO. ND HAWKEYE**
PERMIT NUMBER	AOP-28417	AOP-28417	AOP-28417	AOP-28417	AOP-28417	AOP-28417
EMISSION UNIT	REFRIG # 1	REFRIG # 2	FLASH # 3	FLASH # 1	FLASH # 2	INLET # 4
EQUIPMENT NUMBER	EN-758411	EN-758511	EN-758311	EN-758111	EN-758211	EN-752401
MANUFACTERS NAME	CATERPILLAR	CATERPILLAR	CATERPILLAR	CATERPILLAR	CATERPILLAR	CATERPILLAR
MODEL NUMBER	3516ULB	3516ULB	CG137-8	3508 LE	3508 LE	3606 LE
TYPE OF DRIVER	4SLB	4SLB	4SRB	4SLB	4SLB	4SLB
HORSE POWER (BHP)	1380	1380	400	690	690	1775
@RPM	1400	1400	1800	1400	1400	1000
BTU PER CUBIC FOOT	1020	1020	1020	1020	1020	1020
PRIMARY FUEL TYPE	NATURAL GAS	NATURAL GAS	NATURAL GAS	NATURAL GAS	NATURAL GAS	NATURAL GAS
BSFC (BTU/HP-HR; HHV BASIS)	9500	9500	9522	9470	9470	8454
CALC. MMBTU PER YEAR	114843.60	114843.60	33365.09	57240.47	57240.47	131451.25
CALC. MSCF PER YEAR	112591.76	112591.76	32710.87	56118.11	56118.11	128873.77
CALC. MMSCF PER YEAR	112.59	112.59	32.71	56.12	56.12	128.87
SCHEDULE OF OPERATION						
Hours Per Day	24	24	24	24	24	24
Days Per Week	7	7	7	7	7	7
Weeks Per Year	52	52	52	52	52	52
Actual Hours	8760	8760	8760	8760	8760	8760
AIR CONTAMINANTS FROM						
STACK EMISSIONS						
Particulate (AP-42)						
EF (lb/MMBtu)	9.99E-03	9.99E-03	9.50E-03	9.99E-03	9.99E-03	9.99E-03
Pounds Per Hour (Avg)	1.31E-01	1.31E-01	3.62E-02	6.53E-02	6.53E-02	1.50E-01
Tons Per Year	5.73E-01	5.73E-01	1.58E-01	2.86E-01	2.86E-01	6.56E-01
SO2						
EF (lb/MMBtu)	5.88E-04	5.88E-04	5.88E-04	5.88E-04	5.88E-04	5.88E-04
Pounds Per Hour (Avg)	7.71E-03	7.71E-03	2.24E-03	3.84E-03	3.84E-03	8.82E-03
Tons Per Year	3.38E-02	3.38E-02	9.81E-03	1.68E-02	1.68E-02	3.86E-02
Nitrogen Oxides						
EF (g/hp-hr)	0.5	0.5	1	0.5	0.5	0.5
Pounds Per Hour (Avg)	1.52	1.52	0.88	0.76	0.76	1.95
Tons Per Year	6.66	6.66	3.86	3.33	3.33	8.56
Carbon Monoxide						
EF (g/hp-hr)	0.17	0.17	1	0.18	0.18	0.19
Pounds Per Hour (Avg)	0.52	0.52	0.88	0.27	0.27	0.74
Tons Per Year	2.26	2.26	3.86	1.20	1.20	3.25
NMVOC						
EF (g/hp-hr)	0.24	0.24	0.36	0.28	0.28	0.32
Pounds Per Hour (Avg)	0.73	0.73	0.32	0.43	0.43	1.25
Tons Per Year	3.20	3.20	1.39	1.86	1.86	5.48
HAPs						
Tons Per Year	0.76	0.65	0.42	0.20	1.08	2.16

Engines
Potential to Emit Calculation

FACILITY LOCATION	SEC 35-153-95	SEC 35-153-95	SEC 35-153-95	SEC 35-153-95	SEC 35-153-95	SEC 35-153-95
COUNTY	McKENZIE CO. ND HAWKEYE	McKENZIE CO. ND HAWKEYE	McKENZIE CO. ND HAWKEYE	McKENZIE CO. ND HAWKEYE	McKENZIE CO. ND HAWKEYE	McKENZIE CO. ND HAWKEYE
PERMIT NUMBER	AOP-28417	AOP-28417	AOP-28417	AOP-28417	AOP-28417	AOP-28417
EMISSION UNIT	INLET # 5	INLET # 1	INLET # 2	INLET # 3	EMGGENENG1	EMGGENENG2
EQUIPMENT NUMBER	EN-752501	EN-752101	EN-752201	EN-752301	EN-756136	EN-756236
MANUFACTERS NAME	CATERPILLAR	CATERPILLAR	CATERPILLAR	CATERPILLAR	WAUKESHA	WAUKESHA
MODEL NUMBER	3606 LE	3612 LE	3612 LE	3612 LE	L7044GSI	L7044GSI
TYPE OF DRIVER	4SLB	4SLB	4SLB	4SLB	4SRB	4SRB
HORSE POWER (BHP)	1775	3550	3550	3550	1680	1680
@RPM	1000	1000	1000	1000	1200	1200
BTU PER CUBIC FOOT	1020	1020	1020	1020	1020	1020
PRIMARY FUEL TYPE	NATURAL GAS	NATURAL GAS	NATURAL GAS	NATURAL GAS	NATURAL GAS	NATURAL GAS
BSFC (BTU/HP-HR; HHV BASIS)	8454	8525	8525	8525	9089	9089
CALC. MMBTU PER YEAR	131451.25	265110.45	265110.45	265110.45	1526.95	1526.95
CALC. MSCF PER YEAR	128873.77	259912.21	259912.21	259912.21	1497.01	1497.01
CALC. MMSCF PER YEAR	128.87	259.91	259.91	259.91		
SCHEDULE OF OPERATION						
Hours Per Day	24	24	24	24	EMERGENCY	EMERGENCY
Days Per Week	7	7	7	7	GENERATOR	GENERATOR
Weeks Per Year	52	52	52	52		
Actual Hours	8760	8760	8760	8760	100	100
AIR CONTAMINANTS FROM						
STACK EMISSIONS						
Particulate (AP-42)						
EF (lb/MMBtu)	9.99E-03	9.99E-03	9.99E-03	9.99E-03	9.50E-03	9.50E-03
Pounds Per Hour (Avg)	1.50E-01	3.02E-01	3.02E-01	3.02E-01	1.45E-01	1.45E-01
Tons Per Year	6.56E-01	1.32E+00	1.32E+00	1.32E+00	7.25E-03	7.25E-03
SO2						
EF (lb/MMBtu)	5.88E-04	5.88E-04	5.88E-04	5.88E-04	5.88E-04	5.88E-04
Pounds Per Hour (Avg)	8.82E-03	1.78E-02	1.78E-02	1.78E-02	8.98E-03	8.98E-03
Tons Per Year	3.86E-02	7.79E-02	7.79E-02	7.79E-02	4.49E-04	4.49E-04
Nitrogen Oxides						
EF (g/hp-hr)	0.5	0.5	0.5	0.5	2	2
Pounds Per Hour (Avg)	1.95	3.91	3.91	3.91	7.40	7.40
Tons Per Year	8.56	17.12	17.12	17.12	0.37	0.37
Carbon Monoxide						
EF (g/hp-hr)	0.19	0.19	0.19	0.19	4	4
Pounds Per Hour (Avg)	0.74	1.49	1.49	1.49	14.80	14.80
Tons Per Year	3.25	6.51	6.51	6.51	0.74	0.74
NMVOC						
EF (g/hp-hr)	0.32	0.32	0.32	0.32	1	1
Pounds Per Hour (Avg)	1.25	2.50	2.50	2.50	3.70	3.70
Tons Per Year	5.48	10.96	10.96	10.96	0.19	0.19
HAPs						
Tons Per Year	1.92	1.67	2.92	2.78	0.02	0.02

Heaters
Potential to Emit Calculation

FACILITY NAME	SEC 35-153-95	SEC 35-153-95	SEC 35-153-95	SEC 35-153-95	SEC 35-153-95
	HAWKEYE	HAWKEYE	HAWKEYE	HAWKEYE	HAWKEYE
PERMIT NUMBER	AOP-28417	AOP-28417	AOP-28417	AOP-28417	AOP-28417
EMISSION UNIT	H-756125	H-756325	H-756225	H-756011	D-754005
EQUIPMENT NUMBER	H-756125	H-756325	H-756225	H-756011	D-754005
MANUFACTERS NAME					
MODEL NUMBER	DF 11 BG	DF 11 BG	DF25 BG		
TYPE OF DRIVER	HEATER	HEATER	HEATER	HEATER	HEATER
RATED INPUT (MMBTU/HR)	2.4	2.4	4.5	1.25	1.5
BTU PER CUBIC FOOT	1020	1020	1020	1020	1020
PRIMARY FUEL TYPE	NATURAL GAS	NATURAL GAS	NATURAL GAS	NATURAL GAS	NATURAL GAS
CALC. MMBTU PER YEAR	21024	21024	39420	10950	13140
CALC. MSCF PER YEAR	20611.76	20611.76	38647.06	10735.29	12882.35
SCHEDULE OF OPERATION					
Hours Per Day	24	24	24	24	24
Days Per Week	7	7	7	7	7
Weeks Per Year	52	52	52	52	52
Actual Hours	8760	8760	8760	8760	8760
AIR CONTAMINANTS FROM STACK EMISSIONS					
Particulate (AP-42)					
EF (lb/MMBtu)	7.45E-03	7.45E-03	7.45E-03	7.45E-03	7.45E-03
Pounds Per Hour (Avg)	0.02	0.02	0.03	0.01	0.01
Tons Per Year	0.08	0.08	0.15	0.04	0.05
SO2					
EF (lb/MMBtu)	5.88E-04	5.88E-04	5.88E-04	5.88E-04	5.88E-04
Pounds Per Hour (Avg)	0.001	0.001	0.003	0.001	0.001
Tons Per Year	0.01	0.01	0.01	0.003	0.004
NOx					
EF (lb/MMBtu)	9.80E-02	9.80E-02	9.80E-02	9.80E-02	9.80E-02
Pounds Per Hour (Avg)	0.24	0.24	0.44	0.12	0.15
Tons Per Year	1.03	1.03	1.93	0.54	0.64
CO					
EF (lb/MMBtu)	8.24E-02	8.24E-02	8.24E-02	8.24E-02	8.24E-02
Pounds Per Hour (Avg)	0.20	0.20	0.37	0.10	0.12
Tons Per Year	0.87	0.87	1.62	0.45	0.54
NMVOC (AP-42)					
EF (lb/MMBtu)	5.39E-03	5.39E-03	5.39E-03	5.39E-03	5.39E-03
Pounds Per Hour (Avg)	0.01	0.01	0.02	0.01	0.01
Tons Per Year	0.06	0.06	0.11	0.03	0.04
Total Criteria Pollutants (TPY)	2.04	2.04	3.82	1.06	1.27
HAPs					
Pounds Per Hour (Avg)	0.004	0.004	0.008	0.002	0.003
Tons Per Year	0.02	0.02	0.04	0.01	0.01

Thermal Oxidizer (S-755001)
Hawkeye Gas Facility

Waste Stream:	**EG Still Column (T-754006)**		
C=	379.3	scf/lb-mole	Ideal gas law conversion factor at standard conditions of 60°F and 14.7 psia
NOX	0.075	lb/MMBtu	John Zink Vendor Provided Emission Factor
CO	0.37	lb/MMBtu	John Zink Vendor Provided Emission Factor
PM10	0.0084	lb/MMBtu	
H2S to SO2 conversion	100%		
H2S MW	34.10	lb/lbmol	
SO2 MW	64.07	lb/lbmol	
MW	19.28	lb/lbmol	
MW	19.29	lb/lbmol	
Gas Flow (F) =	35,040,000	scf/yr	

		Composition Data		Flow			VOC Emissions		Net Heat Release		
Component	**MW [lb/lb-mol]**	**mi Mole or Vol [%]**	**Wt [%]**	**Fv Volumetric Flow =F*mi [scf/yr]**	**=Fv/C*MW lb/yr**	**D_i Destruction Efficiency [%]**	**VOC Emissions [lb/yr]**	**VOC Emissions [ton/yr]**	**LHV [Btu/scf]**	**=LHV*m_i [BTU/scf]**	**=LHV*Fv Btu/yr**
Nitrogen	28.0	5.27%	7.65%	1846608.00	136382.20	0%	136382.20	68.19	0.0	0.00	0
CO2	44.0	3.76%	8.58%	1317504.00	152867.63	0%	152867.63	76.43	0.0	0.00	0
Methane	16.0	83.02%	69.06%	29090208.00	1230370.85	98%	24607.42	12.30	909.4	754.98	26,454,635,155
Ethane	30.1	5.97%	9.31%	2091888.00	165834.38	98%	3316.69	1.66	1619	96.65	3,386,766,672
Propane	44.1	1.30%	2.97%	455520.00	52956.57	98%	1059.13	0.53	2315	30.10	1,054,528,800
Iso-Butane	58.1	0.04%	0.12%	14016.00	2147.75	98%	42.95	0.02	3000	1.20	42,048,000
n-Butane	58.1	0.29%	0.87%	101616.00	15571.17	98%	311.42	0.16	3011	8.73	305,965,776
Iso-Pentane	72.1	0.04%	0.15%	14016.00	2666.06	98%	53.32	0.03	3699	1.48	51,845,184
n-Pentane	72.1	0.07%	0.26%	24528.00	4665.61	98%	93.31	0.05	3707	2.59	90,925,296
n-Hexane	86.2	0.02%	0.09%	7008.00	1592.19	98%	31.84	0.02	4404	0.88	30,863,232
Benzene	78.1	0.18%	0.74%	64123.20	13205.32	98%	264.11	0.13	3591	6.57	230,266,411
Cyclohexane	84.2	0.01%	0.04%	3504.00	777.47	98%	15.55	0.01	4180	0.42	14,646,720
n-Heptane	100.2	0.00%	0.02%	1051.20	277.70	98%	5.55	0.00	5100	0.15	5,361,120
Toluene	92.1	0.02%	0.10%	7008.00	1702.36	98%	34.05	0.02	4273	0.85	29,945,184
Ethylbenzene	106.2	0.00%	0.00%	105.12	29.42	98%	0.59	0.00	4971	0.01	522,552
o-Xylene	106.2	0.00%	0.01%	490.56	137.31	98%	2.75	0.00	4958	0.07	2,432,196
n-Octane	114.2	0.00%	0.00%	280.32	84.42	98%	1.69	0.00	5796	0.05	1,624,763
2,2,4-Trimethylpentane	114.2	0.00%	0.02%	1051.20	316.58	98%	6.33	0.00	5734	0.17	6,027,581
n-Nonane	128.3	0.00%	0.00%	70.08	23.70	98%	0.47	0.00	6493	0.01	455,029
n-Decane	142.3	0.00%	0.00%	0.00	0.00	98%	0.00	0.00	7190	0.00	0
H2S	34.1	0.001%	0.00%	350.40	31.48	98%	0.63	0.00	586.79	0.01	205,611
		100.00%				VOC	1923.07	0.96		904.94	31,709,065,283
						NOX	2378.18	1.19			
						CO	11732.35	5.87			
						SO2	59.18	0.03			
						PM10	266.30	0.13			

Thermal Oxidizer (S-755001)
Hawkeye Gas Facility

Waste Stream:	**Purge Gas**		
C=	379.3	scf/lb-mole	Ideal gas law conversion factor at standard conditions of 60°F and 14.7 psia
NOX	0.075	lb/MMBtu	John Zink Vendor Provided Emission Factor
CO	0.37	lb/MMBtu	John Zink Vendor Provided Emission Factor
PM10	0.0084	lb/MMBtu	
H2S to SO2 conversion	100%		
H2S MW	34.10	lb/lbmol	
SO2 MW	64.07	lb/lbmol	
MW	17.09	lb/lbmol	
Gas Flow (F) =	79,278,000	scf/yr	

		Composition Data		Flow			VOC Emissions		Net Heat Release		
Component	**MW [lb/lb-mol]**	**m_i Mole or Vol [%]**	**Wt [%]**	**Fv Volumetric Flow =F*mi [scf/yr]**	**=Fv/C*MW lb/yr**	**D_i Destruction Efficiency [%]**	**VOC Emissions [lb/yr]**	**VOC Emissions [ton/yr]**	**LHV [Btu/scf]**	**=LHV*m_i [BTU/scf]**	**=LHV*Fv Btu/yr**
Nitrogen	28.0	4.03%	6.60%	3192921.45	235786.26	0%	235786.26	117.89	0.0	0.00	0
CO2	44.0	0.00%	0.00%	0.00	0.00	0%	0.00	0.00	0.0	0.00	0
Methane	16.0	92.10%	86.45%	73013936.30	3088144.94	98%	61762.90	30.88	909.4	837.54	66,398,873,674
Ethane	30.1	3.73%	6.56%	2957069.40	234424.74	98%	4688.49	2.34	1618.7	60.38	4,786,608,238
Propane	44.1	0.13%	0.34%	103061.40	11981.53	98%	239.63	0.12	2314.9	3.01	238,576,835
Iso-Butane	58.1	0.00%	0.00%	0.00	0.00	98%	0.00	0.00	3000.4	0.00	0
n-Butane	58.1	0.01%	0.04%	10306.14	1579.29	98%	31.59	0.02	3010.8	0.39	31,029,726
Iso-Pentane	72.2	0.00%	0.00%	0.00	0.00	98%	0.00	0.00	3699.0	0.00	0
n-Pentane	72.2	0.00%	0.00%	0.00	0.00	98%	0.00	0.00	3706.9	0.00	0
n-Hexane	86.2	0.00%	0.01%	872.06	198.14	98%	3.96	0.00	4403.8	0.05	3,840,369
Benzene	78.1	0.00%	0.00%	237.83	48.98	98%	0.98	0.00	3591	0.01	854,062
n-Octane	114.2	0.00%	0.00%	0.00	0.00	98%	0.00	0.00	5796.1	0.00	0
H2S	34.1	0.0005%	0.00%	396.39	35.62	98%	0.71	0.00	586.8	0.00	232,602
H2O	18.0	0.00%	0.00%	0.00	0.00	0%	0.00	0.00	0.0	0.00	0
O2	32.0	0.00%	0.00%	0.00	0.00	98%	0.00	0.00	0.0	0.00	0
		100.00%				VOC	276.16	0.14		901.39	71,460,015,506
						NOX	5359.50	2.68			
						CO	26440.21	13.22			
						SO2	66.95	0.03			
						PM10	602.51	0.30			

Sample Calculation:

NOx annual emissions (tpy) = $\frac{71460015506\ \text{Btu}}{\text{yr}} \times \frac{1\ \text{MMBtu}}{10^6\ \text{Btu}} \times \frac{0.075\ \text{lb}}{\text{MMBtu}} \times \frac{\text{ton}}{2{,}000\ \text{lb}} = \frac{2.680\ \text{ton}}{\text{yr}}$

SO2 annual emissions (tpy) = $\frac{79278000\ \text{scf}}{\text{yr}} \times \frac{0.0005\%\ \text{by vol.}}{} \times \frac{\text{lbmol}}{379.3\ \text{scf}} \times \frac{100\%}{} \times \frac{64.07\ \text{lb}}{\text{lbmol}} \times \frac{\text{ton}}{2{,}000\ \text{lb}} = \frac{0.03\ \text{ton}}{\text{yr}}$

Thermal Oxidizer (S-755001)
Hawkeye Gas Facility

Waste Stream:	**Storage Tank Venting**		
C=	379.3	scf/lb-mole	Ideal gas law conversion factor at standard conditions of 60°F and 14.7 psia
NOX	0.075	lb/MMBtu	John Zink Vendor Provided Emission Factor
CO	0.37	lb/MMBtu	John Zink Vendor Provided Emission Factor
PM10	0.0062	lb/MMBtu	
H2S to SO2 conversion	100%		
H2S MW	34.10	lb/lbmol	
SO2 MW	64.07	lb/lbmol	
MW	42.00	lb/lbmol	
Gas Flow (F) =	273,853	scf/yr	

		Composition Data		Flow			VOC Emissions		Net Heat Release		
Component	**MW [lb/lb-mol]**	**m_i Mole or Vol [%]**	**Wt [%]**	**Fv Volumetric Flow =F*mi [scf/yr]**	**=Fv/C*MW lb/yr**	**D_i Destruction Efficiency [%]**	**VOC Emissions [lb/yr]**	**VOC Emissions [ton/yr]**	**LHV [Btu/scf]**	**=LHV*m_i [BTU/scf]**	**=LHV*Fv Btu/yr**
Methane	16.0	11.21%	4.28%	30699.76	1298.45	98%	25.97	0.01	0.0	0.00	0
Ethane	30.1	23.99%	17.18%	65704.36	5208.71	98%	104.17	0.05	0.0	0.00	0
Propane	44.1	33.01%	34.66%	90395.97	10509.00	98%	210.18	0.11	909.4	300.18	82,206,097
i-Butane	58.1	4.17%	5.77%	11412.83	1748.85	98%	34.98	0.02	1619	67.47	18,477,364
n-Butane	58.1	12.73%	17.61%	34854.98	5341.02	98%	106.82	0.05	2315	294.64	80,689,284
i-Pentane	72.1	2.30%	3.95%	6295.68	1197.54	98%	23.95	0.01	3000	68.97	18,887,052
n-Pentane	72.1	3.18%	5.46%	8703.48	1655.54	98%	33.11	0.02	3011	95.69	26,206,180
Water	18.0	2.52%	1.08%	6897.80	327.34	0%	327.34	0.16	3699	93.17	25,514,951
Nitrogen	28.0	0.08%	0.06%	232.16	17.15	0%	17.15	0.01	3707	3.14	860,614
Carbon Dioxide	44.0	2.57%	2.70%	7044.68	817.38	98%	16.35	0.01	4404	113.29	31,024,788
H2S	34.1	1.42%	1.15%	3893.76	349.86	98%	7.00	0.00	3591	51.06	13,982,479
NBP 197.5	96.0	0.56%	1.28%	1530.37	387.33	98%	7.75	0.00	4180	23.36	6,396,952
NBP 242.1	107.0	0.24%	0.62%	665.59	187.76	98%	3.76	0.00	5100	12.40	3,394,497
NBP 288	121.0	0.04%	0.12%	113.77	36.29	98%	0.73	0.00	4273	1.78	486,118
NBP 348.2	139.7	0.03%	0.09%	74.09	27.29	98%	0.55	0.00	4971	1.34	368,278
Hexane	86.2	1.95%	4.00%	5334.21	1211.91	98%	24.24	0.01	4958	96.57	26,447,037
Ethylene Glycol	62.1	0.00%	0.00%	0.00	0.00	98%	0.00	0.00	5796	0.00	0
		100.00%								1223.07	334,941,691

NOX	25.12	0.01
CO	123.93	0.06
PM10	2.08	0.001
VOC	Emission data provided under ProMax Tank Emissions Report	

Note:
1. Storage tanks primarily vent to the vapor recovery unit (VRU). Thermal oxidizer serves as a backup control device.

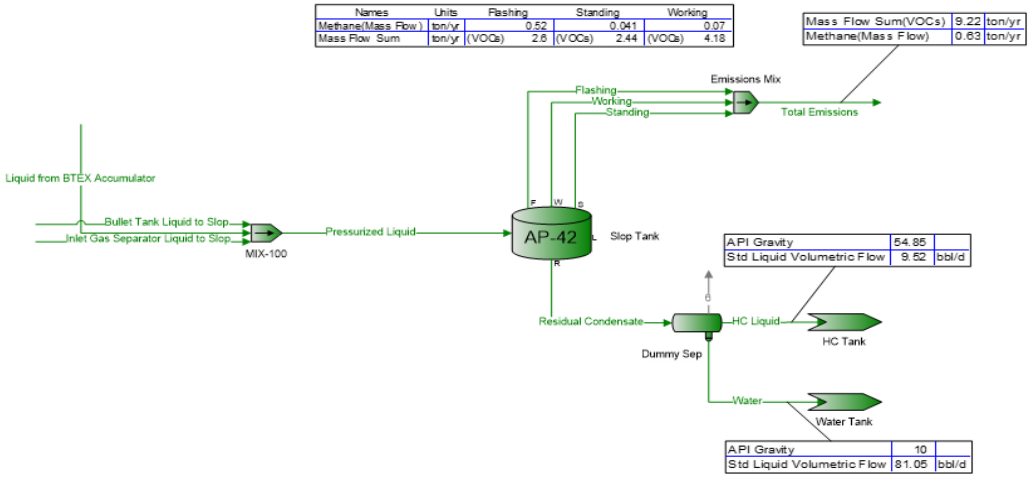
Sample Calculation:

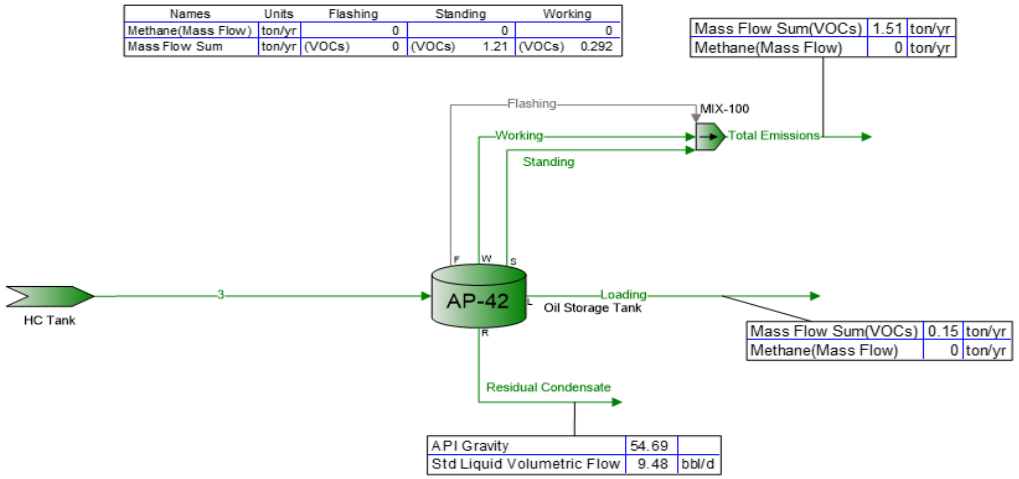
$$\text{NOx annual emissions (tpy)} = \frac{334941691\ \text{Btu}}{\text{yr}} \left| \frac{1\ \text{MMBtu}}{10^6\ \text{Btu}} \right| \frac{0.075\ \text{lb}}{\text{MMBtu}} \left| \frac{\text{ton}}{2{,}000\ \text{lb}} \right| = \frac{0.01\ \text{ton}}{\text{yr}}$$

Thermal Oxidizer (S-755001)
Hawkeye Gas Facility

VOC Emission data from ProMax Tank Emissions Report

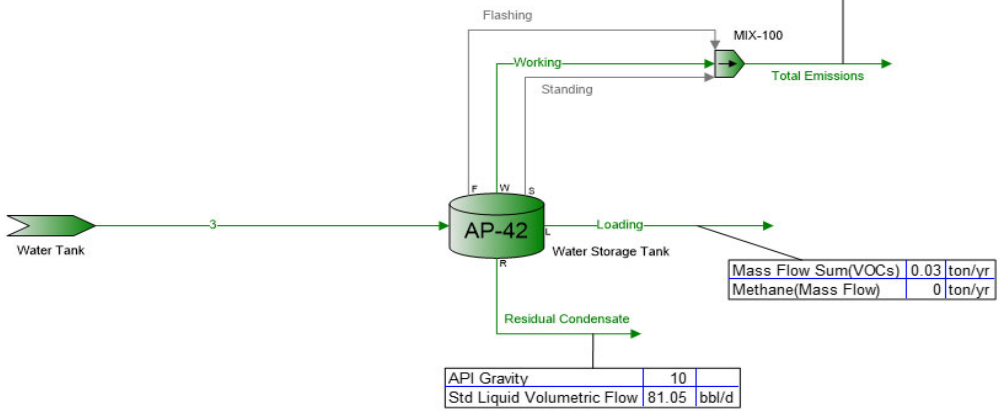
Storage Tank	Uncontrolled Emissions		Controlled Emissions	
	lb/hr	tpy	lb/hr	tpy
Slop Storage Tanks	2.10	9.22	0.04	0.18
Oil Storage Tanks	0.34	1.51	0.01	0.03
Water Storage Tank	0.03	0.13	0.0006	0.003
Methanol Tank	0.01	0.06	0.0003	0.001
Total	2.48	10.86	0.05	0.22





Names	Units	Flashing	Standing	Working
Methane(Mass Flow)	ton/yr	0	0	0
Mass Flow Sum	ton/yr	(VOCs) 0	(VOCs) 0	(VOCs) 0.13

Mass Flow Sum(VOCs)	0.13	ton/yr
Methane(Mass Flow)	0	ton/yr

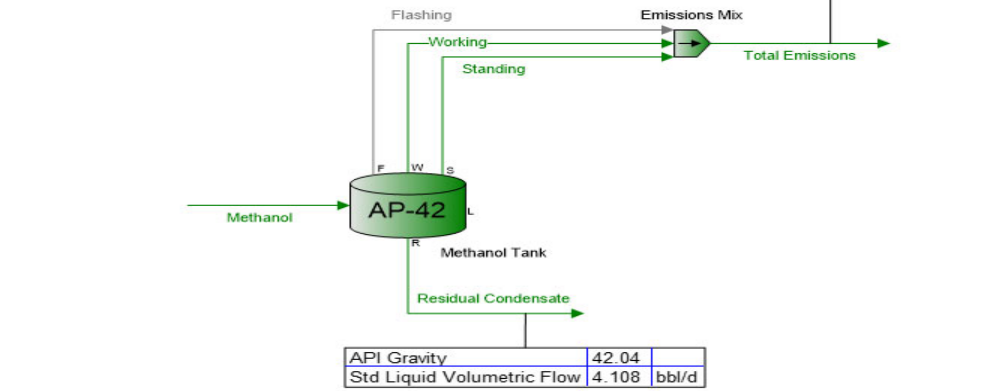


Mass Flow Sum(VOCs)	0.03	ton/yr
Methane(Mass Flow)	0	ton/yr

API Gravity	10	
Std Liquid Volumetric Flow	81.05	bbl/d

Names	Units	Standing	Working	Total Emissions
Mass Flow	ton/yr	0.04	0.02	0.06

Mass Flow Sum(VOCs)	0.06	ton/yr



API Gravity	42.04	
Std Liquid Volumetric Flow	4.108	bbl/d

Process/Emergency Flare (S-755004)
Hawkeye Gas Facility

Waste Stream:	**Waste Gas**		
C=	379.3	scf/lb-mole	Ideal gas law conversion factor at standard conditions of 60°F and 14.7 psia
NOX	0.068	lb/MMBtu	Emissions Factor taken from Table 13.5-1 of AP42.
CO	0.31	lb/MMBtu	Emissions Factor taken from Table 13.5-2 of AP42.
H2S to SO2 conversion	100%		
H2S MW	34.10	lb/lbmol	
SO2 MW	64.07	lb/lbmol	
MW	26.57	lb/lbmol	
Gas Flow (F) =	250,700,000	scf/yr	

		Composition Data		Flow			VOC Emissions		Net Heat Release		
Component	**MW [lb/lb-mol]**	**mi Mole or Vol [%]**	**Wt [%]**	**Fv Volumetric Flow =F*mi [scf/yr]**	**=Fv/C*MW lb/yr**	**D_i Destruction Efficiency [%]**	**VOC Emissions [lb/yr]**	**VOC Emissions [ton/yr]**	**LHV [Btu/scf]**	**=LHV*m_i [BTU/scf]**	**=LHV*Fv Btu/yr**
Nitrogen	28.0	3.02%	3.14%	7571140.00	559170.51	0%	559170.51	279.59	0.0	0.00	0
CO2	44.0	1.35%	2.20%	3384450.00	392691.67	0%	392691.67	196.35	0.0	0.00	0
Methane	16.0	55.78%	33.19%	139847981.00	5914872.75	98%	118297.46	59.15	909.4	507.29	127,177,753,921
Ethane	30.1	20.79%	23.19%	52120530.00	4131853.99	98%	82637.08	41.32	1619	336.59	84,383,138,070
Propane	44.1	10.84%	17.73%	27175880.00	3159337.55	98%	63186.75	31.59	2315	250.95	62,912,162,200
Iso-Butane	58.1	1.25%	2.69%	3133750.00	480201.54	98%	9604.03	4.80	3000	37.50	9,401,250,000
n-Butane	58.1	3.80%	8.19%	9526600.00	1459812.68	98%	29196.25	14.60	3011	114.42	28,684,592,600
Iso-Pentane	72.1	0.78%	2.09%	1955460.00	371959.12	98%	7439.18	3.72	3699	28.85	7,233,246,540
n-Pentane	72.1	1.23%	3.29%	3083610.00	586550.91	98%	11731.02	5.87	3707	45.60	11,430,942,270
n-Hexane	86.2	0.43%	1.37%	1078010.00	244919.44	98%	4898.39	2.45	4404	18.94	4,747,556,040
Benzene	78.1	0.05%	0.14%	125350.00	25814.17	98%	516.28	0.26	3591	1.80	450,131,850
Cyclohexane	84.2	0.08%	0.25%	200560.00	44500.47	98%	890.01	0.45	4180	3.34	838,340,800
n-Heptane	100.2	0.17%	0.63%	426190.00	112589.11	98%	2251.78	1.13	5100	8.67	2,173,569,000
Toluene	92.1	0.04%	0.14%	100280.00	24359.71	98%	487.19	0.24	4273	1.71	428,496,440
Ethylbenzene	106.2	0.01%	0.05%	30084.00	8420.43	98%	168.41	0.08	4971	0.60	149,547,564
o-Xylene	106.2	0.06%	0.25%	160448.00	44908.94	98%	898.18	0.45	4958	3.17	795,501,184
n-Octane	114.2	0.09%	0.38%	225630.00	67949.85	98%	1359.00	0.68	5796	5.22	1,307,774,043
2,2,4-Trimethylpentane	114.2	0.05%	0.21%	125350.00	37749.91	98%	755.00	0.38	5734	2.87	718,756,900
n-Nonane	128.3	0.09%	0.43%	225630.00	76293.69	98%	1525.87	0.76	6493	5.84	1,465,015,590
n-Decane	142.3	0.08%	0.42%	200560.00	75233.37	98%	1504.67	0.75	7190	5.75	1,442,026,400
H2S	34.1	0.002%	0.0025%	5014.00	450.52	98%	9.01	0.00	586.79	0.01	2,942,165
		100.00%				VOC	136412.02	68.21		1379.11	345,742,743,577
						NOX	23510.51	11.76			
						CO	107180.25	53.59			
						SO2	846.89	0.42			

Sample Calculation:

$$\text{NOx annual emissions (tpy)} = \frac{345742743577\ \text{Btu}}{\text{yr}} \left| \frac{1\ \text{MMBtu}}{10^6\ \text{Btu}} \right| \frac{0.068\ \text{lb}}{\text{MMBtu}} \left| \frac{\text{ton}}{2{,}000\ \text{lb}} \right| = \frac{11.76\ \text{ton}}{\text{yr}}$$

Truck Loading - Condensate
Hawkeye Gas Facility

$$L_L = 12.46 \frac{SPM}{T}$$

where:
S = saturation factor
P = true vapor pressure
M = molecular weight of vapors
T = temperature of bulk liquid loaded, °R (°F + 460)

Material loaded = Crude Oil
S = 0.6
P = 2.62 psia
M = 55.56
T = 504

Annual Loading = 144,373 gallons

$$L_L = \frac{12.46 \quad 0.6 \quad 2.62 \text{ psia} \quad 55.56 \text{ lb/lb-mole}}{504 \text{ °R}} = \textbf{2.16 lb/1000 gal}$$

Total Loading Losses:

$$\text{Annual} = \frac{2.16 \text{ lb}}{1000 \text{ gal}} \quad \frac{144{,}373 \text{ gallons}}{2000 \text{ lb}} \text{ ton} = \textbf{0.16 ton/yr}$$

Component	Wt [%]	Emissions (tpy)	
Methane	0.00%	0.00	
Ethane	0.00%	0.00	
Propane	36.40%	0.06	
i-Butane	8.90%	0.01	
n-Butane	29.47%	0.05	
i-Pentane	5.80%	0.01	
n-Pentane	8.13%	0.01	
Water	3.53%	0.01	
Nitrogen	0.00%	0.00	
Carbon Dioxide	0.00%	0.00	
H2S	0.88%	0.00	
NBP 197.5	1.23%	0.00	
NBP 242.1	0.52%	0.00	
NBP 288	0.09%	0.00	
NBP 348.2	0.06%	0.00	
Hexane	4.99%	0.01	
Ethylene Glycol	0.00	0.00	
	100.00%	0.16	tpy
	Total VOC	**0.15**	**tpy**

Truck Loading - Produced Water
Hawkeye Gas Facility

$$L_L = 12.46 \frac{SPM}{T}$$

where:
S = saturation factor
P = true vapor pressure
M = molecular weight of vapors
T = temperature of bulk liquid loaded, °R (°F + 460)

Material loaded = Crude Oil
S = 0.6
P = 0.22 psia
M = 33.77
T = 504

Annual Loading = 1,240,113 gallons

$$L_L = \frac{12.46 \quad 0.6 \quad 0.22 \text{ psia} \quad 33.77 \text{ lb/lb-mole}}{504 \text{ °R}} = \textbf{0.11 lb/1000 gal}$$

Total Loading Losses:

$$\text{Annual} = \frac{0.11 \text{ lb}}{1000 \text{ gal}} \frac{1{,}240{,}113 \text{ gallons}}{2000 \text{ lb}} \text{ ton} = \textbf{0.07 ton/yr}$$

Component	Wt [%]	Emissions (tpy)	
Methane	0.00%	0.00	
Ethane	0.00%	0.00	
Propane	0.00%	0.00	
i-Butane	0.00%	0.00	
n-Butane	0.00%	0.00	
i-Pentane	0.00%	0.00	
n-Pentane	0.00%	0.00	
Water	34.05%	0.02	
Nitrogen	0.00%	0.00	
Carbon Dioxide	0.00%	0.00	
H2S	21.06%	0.01	
NBP 197.5	31.44%	0.02	
NBP 242.1	13.44%	0.01	
NBP 288	0.00%	0.00	
NBP 348.2	0.00%	0.00	
Hexane	0.00%	0.00	
Ethylene Glycol	0.00%	0.00	
	100.00%	0.07	tpy
	Total VOC	**0.03**	**tpy**

CVS Fugitive Emissions
Hawkeye Gas Facility

Component Name	Stream Type	Number of Components	Oil and Gas Production Operation [1] lb/hr/comp	Control Efficiency %	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Valves	Gas/Vapor	74	0.00992	0	0.73	0.27	3.22
Relief valves	Gas/Vapor	1	0.01940	0	0.02	0.01	0.08
Connectors	Gas/Vapor	259	0.00044	0	0.11	0.04	0.50
Compressors	Gas/Vapor	0	0.01940	0	0.00	0.00	0.00
Pumps	Light Liquid	2	0.00529	0	0.01	0.00	0.05
				Total Emission Rate:	**0.88**	**0.32**	**3.85**

1. Factors are taken from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates EPA-453/R-95-017.

Chemical Name	wt% in Stream	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Nitrogen	3.02%	0.027	0.010	0.116
CO2	1.35%	0.012	0.004	0.052
Methane	55.78%	0.490	0.179	2.146
Ethane	20.79%	0.183	0.067	0.800
Propane	10.84%	0.095	0.035	0.417
Iso-Butane	1.25%	0.011	0.004	0.048
n-Butane	3.80%	0.033	0.012	0.146
Iso-Pentane	0.78%	0.007	0.003	0.030
n-Pentane	1.23%	0.011	0.004	0.047
n-Hexane	0.43%	0.004	0.001	0.017
Benzene	0.05%	0.000	0.000	0.002
Cyclohexane	0.08%	0.001	0.000	0.003
n-Heptane	0.17%	0.001	0.001	0.007
Toluene	0.04%	0.000	0.000	0.002
Ethylbenzene	0.01%	0.000	0.000	0.000
o-Xylene	0.06%	0.001	0.000	0.002
n-Octane	0.09%	0.001	0.000	0.003
2,2,4-Trimethylpentane	0.05%	0.000	0.000	0.002
n-Nonane	0.09%	0.001	0.000	0.003
n-Decane	0.08%	0.001	0.000	0.003
H2S	0.00%	0.000	0.000	0.000
Total Emission Rate:		**0.88**	**0.32**	**3.85**
VOC Emission Rate:		**0.17**	**0.06**	**0.73**
Methane Emission Rate:		**0.49**	**0.18**	**2.15**
CO2 Emission Rate:		**0.01**	**0.00**	**0.05**
CO2e Emission Rate:		**12.26**	**4.48**	**53.70**

Inlet Gas System Fugitive Emissions
Hawkeye Gas Facility

Component Name	Stream Type	Number of Components	Oil and Gas Production Operation [1] lb/hr/comp	Control Efficiency %	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Valves	Gas/Vapor	154	0.00992	0	1.53	0.56	6.69
Relief valves	Gas/Vapor	5	0.01940	0	0.10	0.04	0.42
Connectors	Gas/Vapor	556.5	0.00044	0	0.25	0.09	1.07
Compressors	Gas/Vapor	0	0.01940	0	0.00	0.00	0.00
Pumps	Light Liquid	2	0.00529	0	0.01	0.00	0.05
				Total Emission Rate:	**1.88**	**0.69**	**8.24**

1. Factors are taken from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates EPA-453/R-95-017.

Chemical Name	wt% in Stream	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Methane	33.66%	0.633	0.231	2.773
Ethane	23.13%	0.435	0.159	1.905
Propane	17.60%	0.331	0.121	1.450
i-Butane	2.57%	0.048	0.018	0.212
n-Butane	7.25%	0.136	0.050	0.597
i-Pentane	1.53%	0.029	0.011	0.126
n-Pentane	2.14%	0.040	0.015	0.176
Hexane	1.45%	0.027	0.010	0.119
NBP 197.5	0.63%	0.012	0.004	0.052
NBP 242.1	0.23%	0.004	0.002	0.019
NBP 288	0.04%	0.001	0.000	0.004
NBP 348.2	0.05%	0.001	0.000	0.004
Water	6.49%	0.122	0.045	0.535
Nitrogen	1.93%	0.036	0.013	0.159
Carbon Dioxide	1.24%	0.023	0.009	0.102
H2S	0.06%	0.001	0.000	0.005
Ethylene Glycol	0.00%	0.000	0.000	0.000
Total Emission Rate:		**1.88**	**0.69**	**8.24**
VOC Emission Rate:		**0.63**	**0.23**	**2.76**
Methane Emission Rate:		**0.63**	**0.23**	**2.77**
CO2 Emission Rate:		**0.02**	**0.01**	**0.10**
CO2e Emission Rate:		**15.85**	**5.78**	**69.42**

Inlet Gas Compressors Fugitive Emissions
Hawkeye Gas Facility

Component Name	Stream Type	Number of Components	Oil and Gas Production Operation [1] lb/hr/comp	Control Efficiency %	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Valves	Gas/Vapor	56	0.00992	0	0.56	0.20	2.43
Relief valves	Gas/Vapor	0	0.01940	0	0.00	0.00	0.00
Connectors	Gas/Vapor	196	0.00044	0	0.09	0.03	0.38
Compressors	Gas/Vapor	5	0.01940	0	0.10	0.04	0.42
Open-ended Lines	Gas/Vapor	0	0.00441	0	0.00	0.00	0.00
				Total Emission Rate:	**0.74**	**0.27**	**3.24**

1. Factors are taken from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates EPA-453/R-95-017.

Chemical Name	wt% in Stream	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Methane	57.40%	1.080	0.155	1.858
Ethane	21.34%	0.401	0.058	0.691
Propane	11.07%	0.208	0.030	0.358
i-Butane	1.22%	0.023	0.003	0.039
n-Butane	3.43%	0.065	0.009	0.111
i-Pentane	0.58%	0.011	0.002	0.019
n-Pentane	0.81%	0.015	0.002	0.026
Hexane	0.46%	0.009	0.001	0.015
NBP 197.5	0.18%	0.003	0.000	0.006
NBP 242.1	0.06%	0.001	0.000	0.002
NBP 288	0.01%	0.000	0.000	0.000
NBP 348.2	0.01%	0.000	0.000	0.000
Water	0.41%	0.008	0.001	0.013
Nitrogen	1.89%	0.036	0.005	0.061
Carbon Dioxide	0.77%	0.014	0.002	0.025
H2S	0.36%	0.007	0.001	0.012
Ethylene Glycol	0.00%	0.000	0.000	0.000
Total Emission Rate:		**1.88**	**0.27**	**3.24**
VOC Emission Rate:		**0.34**	**0.05**	**0.58**
Methane Emission Rate:		**1.08**	**0.15**	**1.86**
CO2 Emission Rate:		**0.014**	**0.002**	**0.025**
CO2e Emission Rate:		**27.00**	**3.87**	**46.47**

NGL Bullet System Fugitive Emissions
Hawkeye Gas Facility

Component Name	Stream Type	Number of Components	Oil and Gas Production Operation [1] lb/hr/comp	Control Efficiency %	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Valves	Light Liquid	151	0.00992	0	1.50	0.55	6.56
Relief valves	Light Liquid	7	0.01940	0	0.14	0.05	0.59
Connectors	Light Liquid	553	0.00044	0	0.24	0.09	1.07
Compressors	Light Liquid	0	0.01940	0	0.00	0.00	0.00
Pumps	Light Liquid	2	0.00529	0	0.01	0.00	0.05
				Total Emission Rate:	**1.89**	**0.69**	**8.27**

1. Factors are taken from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates EPA-453/R-95-017.

Chemical Name	wt% in Stream	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Methane	19.61%	0.370	0.135	1.622
Ethane	32.66%	0.617	0.225	2.701
Propane	27.70%	0.523	0.191	2.291
i-Butane	3.40%	0.064	0.023	0.281
n-Butane	6.45%	0.122	0.044	0.534
i-Pentane	1.36%	0.026	0.009	0.113
n-Pentane	1.90%	0.036	0.013	0.157
Hexane	1.29%	0.024	0.009	0.107
NBP 197.5	0.56%	0.011	0.004	0.047
NBP 242.1	0.21%	0.004	0.001	0.017
NBP 288	0.04%	0.001	0.000	0.003
NBP 348.2	0.05%	0.001	0.000	0.004
Water	2.41%	0.046	0.017	0.199
Nitrogen	0.48%	0.009	0.003	0.040
Carbon Dioxide	1.23%	0.023	0.008	0.101
H2S	0.65%	0.012	0.004	0.053
Ethylene Glycol	0.00%	0.000	0.000	0.000
Total Emission Rate:		**1.89**	**0.69**	**8.27**
VOC Emission Rate:		**0.81**	**0.30**	**3.55**
Methane Emission Rate:		**0.37**	**0.14**	**1.62**
CO2 Emission Rate:		**0.02**	**0.01**	**0.10**
CO2e Emission Rate:		**9.28**	**3.39**	**40.66**

Gas Dew Point Fugitive Emissions
Hawkeye Gas Facility

Component Name	Stream Type	Number of Components	Oil and Gas Production Operation [1] lb/hr/comp	Control Efficiency %	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Valves	Gas/Vapor	302	0.00992	0	3.00	1.09	13.12
Relief valves	Gas/Vapor	9	0.01940	0	0.17	0.06	0.76
Connectors	Gas/Vapor	1057	0.00044	0	0.47	0.17	2.04
Compressors	Gas/Vapor	0	0.01940	0	0.00	0.00	0.00
Pumps	Light Liquid	2	0.00529	0	0.01	0.00	0.05
				Total Emission Rate:	**3.65**	**1.33**	**15.98**

1. Factors are taken from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates EPA-453/R-95-017.

Chemical Name	wt% in Stream	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Methane	60.93%	2.222	0.811	9.734
Ethane	21.51%	0.785	0.286	3.436
Propane	10.35%	0.378	0.138	1.654
i-Butane	1.02%	0.037	0.014	0.162
n-Butane	2.70%	0.098	0.036	0.431
i-Pentane	0.36%	0.013	0.005	0.057
n-Pentane	0.47%	0.017	0.006	0.075
Hexane	0.13%	0.005	0.002	0.021
NBP 197.5	0.03%	0.001	0.000	0.004
NBP 242.1	0.00%	0.000	0.000	0.000
NBP 288	0.00%	0.000	0.000	0.000
NBP 348.2	0.00%	0.000	0.000	0.000
Water	0.05%	0.002	0.001	0.008
Nitrogen	2.01%	0.073	0.027	0.321
Carbon Dioxide	0.08%	0.003	0.001	0.013
H2S	0.36%	0.013	0.005	0.058
Ethylene Glycol	0.00%	0.000	0.000	0.000
Total Emission Rate:		**3.65**	**1.33**	**15.97**
VOC Emission Rate:		**0.55**	**0.20**	**2.40**
Methane Emission Rate:		**2.22**	**0.81**	**9.73**
CO2 Emission Rate:		**0.00**	**0.00**	**0.01**
CO2e Emission Rate:		**55.56**	**20.28**	**243.36**

Storage Tank Fugitive Emissions
Hawkeye Gas Facility

Component Name	Stream Type	Number of Components	Oil and Gas Production Operation [1] lb/hr/comp	Control Efficiency %	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Valves	Gas/Vapor	60	0.00992	0%	0.60	0.22	2.61
Relief valves	Gas/Vapor	11	0.01940	0%	0.21	0.08	0.93
Connectors	Gas/Vapor	210	0.00044	0%	0.09	0.03	0.41
Open-ended Lines	Gas/Vapor	0	0.00441	0%	0.00	0.00	0.00
				Total Emission Rate:	**0.90**	**0.33**	**3.95**

1. Factors are taken from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates EPA-453/R-95-017.

Chemical Name	wt% in Stream	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Methane	4.28%	0.039	0.014	0.169
Ethane	17.18%	0.155	0.057	0.678
Propane	34.66%	0.312	0.114	1.368
i-Butane	5.77%	0.052	0.019	0.228
n-Butane	17.61%	0.159	0.058	0.695
i-Pentane	3.95%	0.036	0.013	0.156
n-Pentane	5.46%	0.049	0.018	0.216
Water	1.08%	0.010	0.004	0.043
Nitrogen	0.06%	0.001	0.000	0.002
Carbon Dioxide	2.70%	0.024	0.009	0.106
H2S	1.15%	0.010	0.004	0.046
NBP 197.5	1.28%	0.012	0.004	0.050
NBP 242.1	0.62%	0.006	0.002	0.024
NBP 288	0.12%	0.001	0.000	0.005
NBP 348.2	0.09%	0.001	0.000	0.004
Hexane	4.00%	0.036	0.013	0.158
Ethylene Glycol	0.00%	0.000	0.000	0.000
Total Emission Rate:		**0.90**	**0.33**	**3.95**
VOC Emission Rate:		**0.66**	**0.24**	**2.90**
Methane Emission Rate:		**0.04**	**0.01**	**0.17**
CO2 Emission Rate:		**0.02**	**0.01**	**0.11**
CO2e Emission Rate:		**0.99**	**0.36**	**4.33**

Methanol Fugitive Emissions
Hawkeye Gas Facility

Component Name	Stream Type	Number of Components	Oil and Gas Production Operation [1] lb/hr/comp	Control Efficiency %	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Valves	Light Liquid	43	0.00992	0	0.43	0.16	1.87
Relief valves	Light Liquid	1	0.01940	0	0.02	0.01	0.08
Connectors	Light Liquid	154	0.00044	0	0.07	0.02	0.30
Compressors	Light Liquid	0	0.01940	0	0.00	0.00	0.00
Pumps	Light Liquid	21	0.00529	0	0.11	0.04	0.49
				Total Emission Rate:	**0.63**	**0.23**	**2.74**

1. Factors are taken from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates EPA-453/R-95-017.

Chemical Name	wt% in Stream	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Methanol	100.00%	0.63	0.23	2.74
VOC Emission Rate:		**0.63**	**0.23**	**2.74**

Flash Gas Compressor Fugitive Emissions
Hawkeye Gas Facility

Component Name	Stream Type	Number of Components	Oil and Gas Production Operation [1] lb/hr/comp	Control Efficiency %	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Valves	Gas/Vapor	920	0.00992	0	9.13	3.33	39.98
Relief valves	Gas/Vapor	48	0.01940	0	0.93	0.34	4.08
Connectors	Gas/Vapor	3760	0.00044	0	1.66	0.61	7.26
Compressors	Gas/Vapor	8	0.01940	0	0.16	0.06	0.68
Open-ended Lines	Gas/Vapor	0	0.00441	0	0.00	0.00	0.00
				Total Emission Rate:	**11.87**	**4.33**	**52.00**

1. Factors are taken from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates EPA-453/R-95-017.

Chemical Name	wt% in Stream	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Methane	73.85%	8.767	3.200	38.400
Ethane	18.10%	2.149	0.784	9.411
Propane	4.08%	0.484	0.177	2.120
i-Butane	0.19%	0.023	0.008	0.101
n-Butane	0.41%	0.049	0.018	0.215
i-Pentane	0.03%	0.003	0.001	0.015
n-Pentane	0.03%	0.004	0.001	0.016
Hexane	0.00%	0.000	0.000	0.002
NBP 197.5	0.00%	0.000	0.000	0.000
NBP 242.1	0.00%	0.000	0.000	0.000
NBP 288	0.00%	0.000	0.000	0.000
NBP 348.2	0.00%	0.000	0.000	0.000
Water	0.00%	0.000	0.000	0.001
Nitrogen	2.07%	0.246	0.090	1.076
Carbon Dioxide	0.89%	0.105	0.038	0.461
H2S	0.35%	0.041	0.015	0.180
Ethylene Glycol	0.00%	0.000	0.000	0.000
Total Emission Rate:		**11.87**	**4.33**	**52.00**
VOC Emission Rate:		**0.56**	**0.21**	**2.47**
Methane Emission Rate:		**8.77**	**3.20**	**38.40**
CO2 Emission Rate:		**0.11**	**0.04**	**0.46**
CO2e Emission Rate:		**219.28**	**80.04**	**960.45**

Launcher & Slug System Fugitive Emissions
Hawkeye Gas Facility

Component Name	Stream Type	Number of Components	Oil and Gas Production Operation [1] lb/hr/comp	Control Efficiency %	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Valves	Gas/Vapor	168	0.00992	0	1.67	0.61	7.30
Relief valves	Gas/Vapor	5	0.01940	0	0.10	0.04	0.42
Connectors	Gas/Vapor	553	0.00044	0	0.24	0.09	1.07
Compressors	Gas/Vapor	0	0.01940	0	0.00	0.00	0.00
Open-ended Lines	Gas/Vapor	0	0.00441	0	0.00	0.00	0.00
				Total Emission Rate:	**2.01**	**0.73**	**8.79**

1. Factors are taken from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates EPA-453/R-95-017.

Chemical Name	wt% in Stream	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Methane	73.85%	8.767	0.541	6.494
Ethane	18.10%	2.149	0.133	1.592
Propane	4.08%	0.484	0.030	0.359
i-Butane	0.19%	0.023	0.001	0.017
n-Butane	0.41%	0.049	0.003	0.036
i-Pentane	0.03%	0.003	0.000	0.002
n-Pentane	0.03%	0.004	0.000	0.003
Hexane	0.00%	0.000	0.000	0.000
NBP 197.5	0.00%	0.000	0.000	0.000
NBP 242.1	0.00%	0.000	0.000	0.000
NBP 288	0.00%	0.000	0.000	0.000
NBP 348.2	0.00%	0.000	0.000	0.000
Water	0.00%	0.000	0.000	0.000
Nitrogen	2.07%	0.246	0.015	0.182
Carbon Dioxide	0.89%	0.105	0.006	0.078
H2S	0.35%	0.041	0.003	0.030
Ethylene Glycol	0.00%	0.000	0.000	0.000
Total Emission Rate:		**11.87**	**0.73**	**8.79**
VOC Emission Rate:		**0.56**	**0.03**	**0.42**
Methane Emission Rate:		**8.77**	**0.54**	**6.49**
CO2 Emission Rate:		**0.11**	**0.01**	**0.08**
CO2e Emission Rate:		**219.28**	**13.53**	**162.42**

Refrigeration Gas Compressor Fugitive Emissions
Hawkeye Gas Facility

Component Name	Stream Type	Number of Components	Oil and Gas Production Operation [1] lb/hr/comp	Control Efficiency %	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Valves	Gas/Vapor	160	0.00992	0%	1.59	0.58	6.95
Relief valves	Gas/Vapor	13	0.01940	0%	0.25	0.09	1.10
Connectors	Gas/Vapor	560	0.00044	0%	0.25	0.09	1.08
Compressors	Gas/Vapor	2	0.01940	0%	0.04	0.01	0.17
				Total Emission Rate:	**2.13**	**0.78**	**9.31**

1. Factors are taken from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates EPA-453/R-95-017.

Chemical Name	wt% in Stream	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Nitrogen	0.00%	0.000	0.000	0.000
CO2	0.00%	0.000	0.000	0.000
Methane	0.00%	0.000	0.000	0.000
Ethane	4.00%	0.036	0.031	0.372
Propane	94.00%	0.847	0.729	8.750
Iso-Butane	2.00%	0.018	0.016	0.186
n-Butane	0.00%	0.000	0.000	0.000
Iso-Pentane	0.00%	0.000	0.000	0.000
n-Pentane	0.00%	0.000	0.000	0.000
n-Nonane	0.00%	0.000	0.000	0.000
n-Decane	0.00%	0.000	0.000	0.000
H2O	0.00%	0.000	0.000	0.000
Total Emission Rate:		**0.90**	**0.78**	**9.31**
VOC Emission Rate:		**0.87**	**0.74**	**8.94**
Methane Emission Rate:		**0.00**	**0.00**	**0.00**
CO2 Emission Rate:		**0.00**	**0.00**	**0.00**
CO2e Emission Rate:		**0.00**	**0.00**	**0.00**

Dehy Unit, VRU and TO Fugitive Emissions
Hawkeye Gas Facility

Component Name	Stream Type	Number of Components	Oil and Gas Production Operation [1] lb/hr/comp	Control Efficiency %	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Valves	Gas/Vapor	52	0.00992	0	0.52	0.19	2.26
Relief valves	Gas/Vapor	4	0.01940	0	0.08	0.03	0.34
Connectors	Gas/Vapor	182	0.00044	0	0.08	0.03	0.35
Compressors	Gas/Vapor	1	0.01940	0	0.02	0.01	0.08
Open-ended Lines	Gas/Vapor	0	0.00441	0	0.00	0.00	0.00
				Total Emission Rate:	**0.69**	**0.25**	**3.04**

1. Factors are taken from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates EPA-453/R-95-017.

Chemical Name	wt% in Stream	Controlled Emission Rate lb/hr	Controlled Emission Rate ton/month	Controlled Emission Rate ton/year
Nitrogen	7.65%	0.909	0.019	0.232
CO2	8.58%	1.019	0.022	0.260
Methane	69.06%	8.198	0.175	2.097
Ethane	9.31%	1.105	0.024	0.283
Propane	2.97%	0.353	0.008	0.090
Iso-Butane	0.12%	0.014	0.000	0.004
n-Butane	0.87%	0.104	0.002	0.027
Iso-Pentane	0.15%	0.018	0.000	0.005
n-Pentane	0.26%	0.031	0.001	0.008
n-Hexane	0.09%	0.011	0.000	0.003
Benzene	0.74%	0.088	0.002	0.023
Cyclohexane	0.04%	0.005	0.000	0.001
n-Heptane	0.02%	0.002	0.000	0.000
Toluene	0.10%	0.011	0.000	0.003
Ethylbenzene	0.00%	0.000	0.000	0.000
o-Xylene	0.01%	0.001	0.000	0.000
n-Octane	0.00%	0.001	0.000	0.000
2,2,4-Trimethylpentane	0.02%	0.002	0.000	0.001
Total Emission Rate:		**11.87**	**0.25**	**3.04**
VOC Emission Rate:		**0.64**	**0.01**	**0.16**
Methane Emission Rate:		**0.91**	**0.02**	**0.23**
CO2 Emission Rate:		**1.02**	**0.02**	**0.26**
CO2e Emission Rate:		**23.74**	**0.51**	**6.07**

Appendix C

TITLE V PERMIT TO OPERATE - RENEWAL APPLICATION

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 52824 (9-2021)

In accordance with 33.1-15-14-04.c. of the North Dakota Air Pollution Control Rules, a Title V permit renewal application must be submitted to the Department at least six months, but no more than eighteen months, prior to the expiration date. Permit renewal applications are incomplete unless all information requested herein is supplied. The current Title V permit will be the baseline reference for this renewal. The requirements (40 CFR 70.5(c) & NDAC 33.1-15-14-06.4.c) to include a citation and description of all applicable requirements and a description of or reference to any applicable test method for determining compliance with each applicable requirement may be met by accomplishing either or both of the following: 1) enclose an annotated (red-lined) copy of the current permit indicating all changes needed to reflect the current facility configuration, applicable requirements and test methods; 2) enclose a narrative that conveys all changes needed to the current permit to reflect the current facility configuration, all applicable requirements and test methods.

FOR ACID RAIN UNITS ONLY – Submit with the Title V permit renewal application all Acid Rain renewal applications (the Acid Rain Permit Application, the Phase II NO_x Compliance Plan, and if applicable, the Phase II NO_x Averaging Plan).

PART 1. GENERAL APPLICATION INFORMATION

Owner's Name: Hess North Dakota Pipelines LLC

Facility Name: Hawkeye Gas Facility

Name of Person Completing Application: Kashif Malik Phone: (713) 496-4054

Title: Advisor EHS Email: kashif.malik@hess.com

Current Operating Permit Number: AOP-28417 v1.0

Expiration Date of Current Operating Permit: 09 / 22 / 2025

PART 2. COMPLIANCE CERTIFICATION

A. Schedule for Submission of Compliance Certifications During the Term of the Permit

Frequency of Submittal	Date Beginning (month/day/year)
Annually	02/15/2022

B. Statement of Compliance with Compliance Assurance Monitoring (CAM) and Compliance Certification Requirements

The facility identified in this application is in compliance with applicable monitoring and compliance certification requirements.

- ☑ Yes
- ☐ No - Describe below which requirements are not being met:
- ☑ CAM not applicable

C. Certification of Compliance with all Applicable Requirements

This certification must be signed by a "responsible official" as defined in NDAC 33.1-15-14-06.1. Forms without a signed certification will be returned as incomplete.

Except for requirements identified in Compliance Schedule and Plan (Section G) of Title V Permit to Operate application forms for which compliance is not achieved, I hereby certify that, based on information and belief formed after reasonable inquiry, the air contaminant source identified in this form is in compliance with all applicable requirements.

Signed	Date
	03/20/2025
Typed Name Charles Leon Tack	

PART 3. STATUS OF SOURCE

Has there been any change to the source since the most recent initial or renewal permit application, minor permit modification, significant modification or administrative permit amendment?

☐ No ☑ Yes

If yes, complete and submit appropriate sections of Title V Permit to Operate application forms.

PART 4. CERTIFICATION OF TRUTH, ACCURACY AND COMPLETENESS

Note: This certification must be signed by a "responsible official" as defined in NDAC 33.1-15-14-06.1. Applications without a signed certification will be returned as incomplete.

I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate and complete.

Name (typed) Charles Leon Tack

(Signed) _____ Date 03 / 20 / 2025

Telephone Number (701) 664-6221

Send original renewal application to:

North Dakota Department of Environmental Quality
Division of Air Quality
4201 Normandy Street, 2nd Floor
Bismarck, ND 58503-1324
(701)328-5188

Send copy of renewal application to:

Air Program (8P-AR)
Office of Partnerships & Regulatory Assistance
US EPA Region 8
1595 Wynkoop Street
Denver, CO 80202-1129