December 2024

Via STEERS

Air Permits Initial Review Team
Texas Commission on Environmental Quality
MC 161
Austin, Texas 78711-3087

RE: Non-Rule Standard Permit Registration No. 175144
Vital Energy, Inc., CN604527994
Benedum Central Tank Battery, RN111885075

Dear Sir/Madam,

MHT Consulting, LLC (MHT) is submitting the attached Non-Rule Standard Registration on behalf of Vital Energy, Inc. for the above-referenced facility, located in Upton County, Texas. Please note that changes within this application are the result of a self-audit and include increased throughput and increased fugitive counts. The facility was authorized under APD Cert no. 164307 and Permit-by-Rule Registration No. 149718 (RN110070646).

If you require any further information regarding this application, please contact me via email at lauren@mhtconsulting.us or by phone at 405-760-6703.

Sincerely,

Lauren White

Lauren White
Senior Environmental Professional

TABLE OF CONTENTS

Vital Energy, Inc., CN604527994
Benedum Central Tank Battery, RN111885075
December 2024

TCEQ FORMS AND CHECKLISTS

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions on completing this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (*If other is checked please describe in space provided.*)

☒ New Permit, Registration or Authorization (*Core Data Form should be submitted with the program application.*)

☐ Renewal *(Core Data Form should be submitted with the renewal form)* ☐ Other

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	**3. Regulated Entity Reference Number** *(if issued)*
CN 604527994		**RN 111885075**

SECTION II: Customer Information

4. General Customer Information | **5. Effective Date for Customer Information Updates** (mm/dd/yyyy)

☐ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name *(If an individual, print last name first: eg: Doe, John)* | *If new Customer, enter previous Customer below:*

7. TX SOS/CPA Filing Number	**8. TX State Tax ID** (11 digits)	**9. Federal Tax ID** (9 digits)	**10. DUNS Number** *(if applicable)*

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☐ Limited
Government: ☐ City ☐ County ☐ Federal ☐ Local ☐ State ☐ Other ☐ Sole Proprietorship ☐ Other:

12. Number of Employees
☐ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

13. Independently Owned and Operated?
☐ **Yes** ☐ **No**

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following*

☐ Owner ☐ Operator ☐ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ VCP/BSA Applicant ☐ Other:

15. Mailing Address:							
	City		**State**		**ZIP**	**ZIP + 4**	

16. Country Mailing Information *(if outside USA)*	**17. E-Mail Address** *(if applicable)*

18. Telephone Number	**19. Extension or Code**	**20. Fax Number** *(if applicable)*

( ) -		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected, a new permit application is also required.)*

☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated, in order to meet TCEQ Core Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name *(Enter name of the site where the regulated action is taking place.)*

Stork Tank Battery

23. Street Address of the Regulated Entity: ***(No PO Boxes)***								
	City		**State**		**ZIP**		**ZIP + 4**	
24. County	Upton							

If no Street Address is provided, fields 25-28 are required.

25. Description to Physical Location:	INTERSECTION OF FM-1555 & CR-102 TRAVEL SOUTH ON CR-102 FOR 0.89 MILES. TURN LEFT ON LOCAL ROAD FOR 1.76 MILES. TURN LEFT ON LOCAL ROAD FOR 0.21 MILES. FACILITY ON LEFT.				
26. Nearest City			**State**	**Nearest ZIP Code**	
Rankin			TX	79778	

Latitude/Longitude are required and may be added/updated to meet TCEQ Core Data Standards. (Geocoding of the Physical Address may be used to supply coordinates where none have been provided or to gain accuracy).

27. Latitude (N) In Decimal:	31.321500		**28. Longitude (W) In Decimal:**	-101.864300	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
31	19	17.40	-101	51	51.48

29. Primary SIC Code (4 digits)	**30. Secondary SIC Code** (4 digits)	**31. Primary NAICS Code** (5 or 6 digits)	**32. Secondary NAICS Code** (5 or 6 digits)
1311		211120	

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Oil and natural gas extraction

34. Mailing Address:	**521 E. 2ND STREET**							
	City	**Tulsa**	**State**	**OK**	**ZIP**	**74120**	**ZIP + 4**	
35. E-Mail Address:								

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
( ) -		( ) -

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☒ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
	NPN 175144			
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☐ Wastewater	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Lauren White		**41. Title:**	Sr. Environmental Professional
42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**	
(405 **)** 760-6703		**( )** -	lauren@mhtconsulting.us	

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	Vital Energy, Inc.	**Job Title:**	Vice President and Chief Sustainability Officer
Name *(In Print):*	Dr. David Ferris	**Phone:**	**(** 918 **)** 513- **4570**
Signature:		**Date:**	

Texas Commission on Environmental Quality
Form PI-1S
Registrations for Air Standard Permit
(Page 1)

I. Registrant Information		
A. Company or Other Legal Customer Name:		
Vital Energy, Inc.		
B. Company Official Contact Information (☐ Mr. ☐ Mrs. ☐ Ms. ☒ Other:) Dr.		
Name: David Ferris		
Title: Vice President and Chief Sustainability Officer		
Mailing Address: 521 E. 2ND STREET		
City: Tulsa	State: OK	ZIP Code: 74120
Phone: (918) 513-4570	Fax:	
Email Address: david.ferris@vitalenergy.com		
All permit correspondence will be sent via email.		
C. Technical Contact Information (☐ Mr. ☐ Mrs. ☒ Ms. ☐ Other:)		
Name: Mary Guinn		
Title: Air Quality Specialist		
Company Name: Vital Energy, Inc.		
Mailing Address: 521 E. 2ND STREET		
City: Tulsa	State: OK	ZIP Code: 74120
Phone: (918) 289-4274	Fax:	
Email Address: mary.guinn@vitalenergy.com		
II. Facility and Site Information		
A. Name and Type of Facility		
Facility Name: Benedum Central Tank Battery		
Type of Facility:	☒ Permanent ☐ Temporary	
For portable units, please provide the serial number of the equipment being authorized below.		
Serial No:	Serial No:	

Texas Commission on Environmental Quality
Form PI-1S
Registrations for Air Standard Permit
(Page 2)

II. Facility and Site Information *(continued)*		
B. Facility Location Information		
Street Address:		
If there is no street address, provide written driving directions to the site and provide the closest city or town, county, and ZIP code for the site (attach description if additional space is needed).		
INTERSECTION OF FM-1555 & CR-102 TRAVEL SOUTH ON CR-102 FOR 0.89 MILES. TURN LEFT ON LOCAL RO		
City: Rankin	County: Upton	ZIP Code: 79778
Latitude (nearest second): 31.321500	Longitude (nearest second): -101.864300	
C. Core Data Form (**required** for Standard Permits 6006, 6007, and 6013).		
Is the Core Data Form (TCEQ Form 10400) attached?	☒ Yes ☐ No	
If "No," provide customer reference number (CN) and regulated entity number (RN) below.		
Customer Reference Number (CN):		
Regulated Entity Number (RN):		
D. TCEQ Account Identification Number (if known):		
E. Type of Action:		
☒ Initial Application ☐ Change to Registration ☐ Renewal ☐ Renewal Certification		
For Change to Registration, Renewal, or Renewal Certification actions provide the following:		
Registration Number:	Expiration Date:	
F. Standard Permit Claimed:		
G. Previous Standard Exemption or PBR Registration Number:		
Is this authorization for a change to an existing facility previously authorized under a standard exemption or PBR?	☐ Yes ☒ No	
If "Yes," enter previous standard exemption number(s) and PBR registration number(s) and associated effective date in the spaces provided below.		

Standard Exemption and PBR Registration Number(s)	**Effective Date**

II. Facility and Site Information *(continued)*	
H. Other Facilities at this Site Authorized by Standard Exemption, PBR, or Standard Permit	
Are there any other facilities at this site that are authorized by an Air Standard Exemption, PBR, or Standard Permit?	☐ Yes ☒ No
If "Yes," enter standard exemption number(s), PBR registration number(s), and Standard Permit registration number(s), and associated effective date in the spaces provided below.	
Standard Exemption, PBR Registration, and Standard Permit Registration Number(s)	**Effective Date**
I. Other Air Preconstruction Permits	
Are there any other air preconstruction permits at this site?	☐ Yes ☒ No
If "Yes," enter permit number(s) in the spaces provided below.	
J. Affected Air Preconstruction Permits	
Does the standard permit directly affect any permitted facility?	☐ Yes ☒ No
If "Yes," enter permit number(s) in the spaces provided below.	

II. Facility and Site Information *(continued)*	
K. Federal Operating Permit (FOP) Requirements	
Is this facility located at a site that is required to obtain an FOP pursuant to 30 TAC Chapter 122?	☐ Yes ☒ No ☐ To Be Determined
If the site currently has an existing FOP, enter the permit number:	
Check the requirements of 30 TAC Chapter 122 that will be triggered if this standard permit is approved (*check all that apply).*	
☐ Initial Application for an FOP ☐ Significant Revision for an SOP ☐ Minor Revision for an SOP ☐ Operational Flexibility/Off Permit Notification for an SOP ☐ Revision for a GOP ☐ To be Determined ☒ None	
Identify the type(s) of FOP issued and/or FOP application(s) submitted/pending for the site. *(check all that apply)*	
☐ SOP ☐ GOP ☐ GOP application/revision (submitted or under APD review) ☒ N/A ☐ SOP application/revision (submitted or under APD review)	
III. Fee Information *(see Section IX. for address to send fee or go to www.tceq.texas.gov/epay to pay online)*	
A. Fee Amount: $850	
B. Payment Information	
Check/money order/transaction or voucher number:	
Individual or company name on check:	
Was fee paid online?	☒ Yes ☐ No

Texas Commission on Environmental Quality
Form PI-1S
Registrations for Air Standard Permit
(Page 5)

IV. Public Notice *(if applicable)*			
A. Responsible Person (☐ Mr. ☐ Mrs. ☐ Ms. ☐ Other:)_____			
Name:			
Title:			
Company:			
Mailing Address:			
City:	State:	ZIP Code:	
Phone:	Fax No.:		
Email Address:			
B. Technical Contact (☐ Mr. ☐ Mrs. ☐ Ms. ☐ Other):_____			
Name:			
Title:			
Company:			
Mailing Address:			
City:	State:	ZIP Code:	
Phone No.:	Fax No.:		
Email Address:			
C. Bilingual Notice			
Is a bilingual program required by the Texas Education Code in the School District?			☐ Yes ☐ No
Are the children who attend either the elementary school or the middle school closest to your facility eligible to be enrolled in a bilingual program provided by the district?			☐ Yes ☐ No
If "Yes," list which language(s) are required by the bilingual program?			
D. Small Business Classification and Alternate Public Notice			
Does this company (including parent companies and subsidiary companies) have fewer than 100 employees or less than $6 million in annual gross receipts?			☐ Yes ☐ No
Is the site a major source under 30 TAC Chapter 122, Federal Operating Permit Program?			☐Yes ☐ No
Are the site emissions of any individual regulated air contaminant equal to or greater than 50 tpy?			☐ Yes ☐ No
Are the site emissions of all regulated air contaminant combined equal to or greater than 75 tpy?			Yes ☐ No

V.	**Renewal Certification Option**	
A.	Does the permitted facility emit an air contaminant on the Air Pollutant Watch List, and is the permitted facility located in an area on the watch list?	☐ Yes ☐ No
B.	For facilities participating in the Houston/Galveston/Brazoria area (HGB) cap and trade program for highly reactive VOCs (HRVOCs), do the HRVOCs need to be speciated on the maximum allowable emission rates table (MAERT)?	☐ Yes ☐ No
C.	Does the company and/or site have an unsatisfactory compliance history?	☐ Yes ☐ No
D.	Are there any applications currently under review for this standard permit registration?	☐ Yes ☐ No
E.	Are scheduled maintenance, startup, or shutdown emissions required to be included in the standard permit registration at this time?	☐ Yes ☐ No
F.	Are any of the following actions being requested at the time of renewal:	☐ Yes ☐ No
1.	Are there any facilities that have been permanently shutdown that are proposed to be removed from the standard permit registration?	☐ Yes ☐ No
2.	Do changes need to be made to the standard permit registration in order to remain in compliance?	☐ Yes ☐ No
3.	Are sources or facilities that have always been present and represented, but never identified in the standard permit registration, proposed to be included with this renewal?	☐ Yes ☐ No
4.	Are there any changes to the current emission rates table being proposed?	☐ Yes ☐ No

*Note: If answers to all of the questions in Section V. Renewal Certification Option are "No," use the certification option and skip to Section VII. of this form. If the answers to any of the questions in Section V. Renewal Certification Option are "Yes," the certification option **cannot** be used.*

*If notice is applicable and comments are received in response to the public notice, the application does not qualify for the renewal certification option.

VI. Technical Information Including State and Federal Regulatory Requirements

Place a check next to the appropriate box to indicate what you have included in your submittal.

*Note: Any technical or essential information needed to confirm that facilities are meeting the requirements of the standard permit must be provided. Not providing key information could result in an automatic deficiency and voiding of the projec*t.

A.	Standard Permit requirements (Checklists are optional; however, your review will go faster if you provide applicable checklists.)	
	Did you demonstrate that the general requirements in 30 TAC Sections 116.610 and 116.615 are met?	☒ Yes ☐ No
	Did you demonstrate that emission limitations in 30 TAC Sections 106.261 and 106.262 are met?	☐ Yes ☒ No

VI. Technical Information Including State and Federal Regulatory Requirements *(continued)*	
Place a check next to the appropriate box to indicate what you have included in your submittal.	
Note: Any technical or essential information needed to confirm that facilities are meeting the requirements of the standard permit must be provided. Not providing key information could result in an automatic deficiency and voiding of the project.	
Did you demonstrate that the individual requirements of the specific standard permit are met?	☒ Yes ☐ No
B. Confidential Information (All pages properly marked "CONFIDENTIAL")	☐ Yes ☒ No
C. Process Flow Diagram	☒ Yes ☐ No
D. Process Description	☒ Yes ☐ No
E. Maximum Emissions Data and Calculations	☒ Yes ☐ No
F. Plot Plan	☒ Yes ☐ No
G. Projected Start Of Construction Date, Start Of Operation Date, and Length of Time at Site:	☐ Yes ☐ No
Projected Start of Construction (provide date):	
Projected Start of Operation (provide date):	
Length of Time at the Site: permanent	

VII. Delinquent Fees and Penalties
This form **will not be processed** until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ are paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ website at: www.tceq.texas.gov/agency/financial/fees/delin/index.html.

VIII. Signature Requirements
The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7; the Texas Health and Safety Code, Chapter 382, the Texas Clean Air Act (TCAA) the air quality rules of the Texas Commission on Environmental Quality; or any local governmental ordinance or resolution enacted pursuant to the TCAA. I further state that I understand my signature indicates that this application meets all applicable nonattainment, prevention of significant deterioration, or major source of hazardous air pollutant permitting requirements. The signature further signifies awareness that intentionally or knowingly making or causing to be made false material statements or representations in the application is a criminal offense subject to criminal penalties.
Name (printed): Dr. David Ferris
Signature (original signature required):
Date:

IX. Copies of the Registration		
Copies must be sent as listed below. Processing delays will occur if copies are not sent as noted.		
Who	**Where**	**What**
Air Permits Initial Review Team (APIRT)	Regular, Certified, Priority Mail Mail Code 161, P.O. Box 13087, Austin, Texas 78711-3087 OR Hand Delivery, Overnight Mail Mail Code 161, 12100 Park 35 Circle, Building C, Third Floor, Room 300 W, Austin, Texas 78753	Originals of Form PI-1S, Core Data Form, all attachments. Not required if using ePermits[2].
Revenue Section TCEQ	Regular, Certified, Priority Mail Mail Code 214, P.O. Box 13088, Austin, Texas 78711-3088 OR Hand Delivery, Overnight Mail Mail Code 214, 12100 Park 35 Circle, Building A, Third Floor, Austin, Texas 78753	Original Money Order or Check, Copy of Form PI-1S, Core Date Form. Not required if fee was paid using ePay[3].
Appropriate TCEQ Regional Office	To find your regional office address go to www.tceq.texas.gov/assets/public/comm_exec/pubs/gi/gi-002.pdf or call (512) 239-1250	Copy of Form PI-1S, Core Data Form, and all attachments. Not required if using ePermits[2]
Appropriate Local Air Pollution Control Program(s)	To find your local air pollution control programs go to www.tceq.texas.gov/permitting/air/local_programs.html or call (512) 239-1250	Copy of Form PI-1S, Core Data Form, and all attachments

[2] ePermits located at www3.tceq.texas.gov/steers/
[3] ePay located at www.tceq.texas.gov/epay/

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date:	12/2024	Permit No.:	175144	Regulated Entity No.:	RN111885075
Area Name:	Benedum Central Tank Battery			Customer Reference No.:	CN604527994

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		(A) POUND PER HOUR	(B) TPY
HT-01	HT-01	0.50-mmBtu/hr Heater Treater	NOx	0.04	0.16
			CO	0.03	0.14
			VOC	<0.01	<0.01
			SO_2	<0.01	<0.01
			PM	<0.01	0.01
			Total HAP	<0.01	<0.01
OST-01	OST-01	500-bbl Oil Tank	VOC	0.93	4.07
			H_2S	<0.01	<0.01
			Total HAP	0.04	0.16
OST-02	OST-02	500-bbl Oil Tank	VOC	0.93	4.07
			H_2S	<0.01	<0.01
			Total HAP	0.04	0.16

OST-03	OST-03	500-bbl Oil Tank	VOC	0.93	4.07
			H_2S	<0.01	<0.01
			Total HAP	0.04	<0.01
OST-04	OST-04	500-bbl Oil Tank	VOC	0.93	4.07
			H_2S	<0.01	<0.01
			Total HAP	0.04	0.16
WST-01	WST-01	500-bbl Produced Water Tank	VOC	0.02	0.09
			H_2S	<0.01	<0.01
			Total HAP	<0.01	<0.01
WST-02	WST-02	500-bbl Produced Water Tank	VOC	0.02	0.09
			H_2S	<0.01	<0.01
			Total HAP	<0.01	<0.01
WST-03	WST-03	500-bbl Produced Water Tank	VOC	0.02	0.09
			H_2S	<0.01	<0.01
			Total HAP	<0.01	<0.01
WST-04	WST-04	500-bbl Produced Water Tank	VOC	0.02	0.09
			H_2S	<0.01	<0.01
			Total HAP	<0.01	<0.01
WST-05	WST-05	500-bbl Produced Water Tank	VOC	0.02	0.09
			H_2S	<0.01	<0.01
			Total HAP	<0.01	<0.01
WST-06	WST-06	500-bbl Produced Water Tank	VOC	0.02	0.09
			H_2S	<0.01	<0.01
			Total HAP	<0.01	<0.01

FL-01	FL-01	Standard Flare	NOx	7.79	34.10
			CO	15.54	68.09
			VOC	47.37	73.73
			SO_2	0.83	1.42
			PM	0.35	1.54
			H_2S	<0.01	0.02
			Total HAP	1.70	2.64
FE-01	FE-01	Fugitive Emissions	VOC	1.24	5.42
			H_2S	<0.01	0.01
			Total HAP	0.06	0.27
MSS-01	MSS-01	Maintenance, Startup, Shutdown Activities	VOC	186.21	2.46
			H_2S	0.03	<0.01
			Total HAP	6.78	0.08

EPN = Emission Point Number
FIN = Facility Identification Number

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date:	12/2024	Permit No.:	175144	Regulated Entity No.:	RN111885075
Area Name:	Benedum Central Tank Battery			Customer Reference No.:	CN604527994

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA			EMISSION POINT DISCHARGE PARAMETERS										
1. Emission Point			4. UTM Coordinates of Emission Point			Source							
								7. Stack Exit Data			8. Fugitives		
EPN (A)	FIN (B)	Name (C)	Zone	East (Meters)	North (Meters)	5. Building Height (ft)	6. Height Above Ground (ft)	Diameter (ft) (A)	Velocity (FPS) (B)	Temperature (°F) (C)	Length (Ft.) (A)	Width (Ft.) (B)	Axis Degrees (C)
HT-01	HT-01	0.50-mmBtu/hr Heater Treater	13R	227426	3468777		20.0	0.7	6.9	700			
OST-01	OST-01	500-bbl Oil Tank	13R	227426	3468777		16.0	15.5		Ambient			
OST-02	OST-02	500-bbl Oil Tank	13R	227426	3468777		16.0	15.5		Ambient			
OST-03	OST-03	500-bbl Oil Tank	13R	227426	3468777		16.0	15.5		Ambient			
OST-04	OST-04	500-bbl Oil Tank	13R	227426	3468777		16.0	15.5		Ambient			
WST-01	WST-01	500-bbl Produced Water Tank	13R	227426	3468777		16.0	15.5		Ambient			
WST-02	WST-02	500-bbl Produced Water Tank	13R	227426	3468777		16.0	15.5		Ambient			
WST-03	WST-03	500-bbl Produced Water Tank	13R	227426	3468777		16.0	15.5		Ambient			
WST-04	WST-04	500-bbl Produced Water Tank	13R	227426	3468777		16.0	15.5		Ambient			
WST-05	WST-05	500-bbl Produced Water Tank	13R	227426	3468777		16.0	15.5		Ambient			
WST-06	WST-06	500-bbl Produced Water Tank	13R	227426	3468777		16.0	15.5		Ambient			
FL-01	FL-01	Standard Flare	13R	227426	3468777		20.0	0.3	399.4	1,000			
FE-01	FE-01	Fugitive Emissions	13R	227426	3468777		3.00			Ambient			
MSS-01	MSS-01	Maintenance, Startup, Shutdown Activities	13R	227426	3468777		3.00						

EPN = Emission Point Number
FIN = Facility Identification Number

Vital Energy, Inc.
Benedum Central Tank Battery
TCEQ Emission Summary

ESTIMATED EMISSIONS

Equipment	Unit ID	Specific VOC or Other Pollutants	VOC		NOx		CO		SO_2		PM_{10}		$PM_{2.5}$		H_2S	
			lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
0.50-mmBtu/hr Heater Treater	HT-01		<0.01	<0.01	0.04	0.16	0.03	0.14	<0.01	<0.01	<0.01	0.01	<0.01	0.01	-	-
500-bbl Oil Tank	OST-01		0.93	4.07	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01
500-bbl Oil Tank	OST-02		0.93	4.07	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01
500-bbl Oil Tank	OST-03		0.93	4.07	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01
500-bbl Oil Tank	OST-04		0.93	4.07	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01
500-bbl Produced Water Tank	WST-01		0.02	0.09	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01
500-bbl Produced Water Tank	WST-02		0.02	0.09	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01
500-bbl Produced Water Tank	WST-03		0.02	0.09	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01
500-bbl Produced Water Tank	WST-04		0.02	0.09	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01
500-bbl Produced Water Tank	WST-05		0.02	0.09	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01
500-bbl Produced Water Tank	WST-06		0.02	0.09	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01
Standard Flare	FL-01		47.37	73.73	7.79	34.10	15.54	68.09	0.83	1.42	0.35	1.54	0.35	1.54	<0.01	0.02
Fugitive Emissions	FE-01		1.24	5.42	-	-	-	-	-	-	-	-	-	-	<0.01	0.01
Maintenance, Startup, Shutdown Activities	MSS-01		186.21	2.46	-	-	-	-	-	-	-	-	-	-	0.03	<0.01
TOTAL EMISSIONS (TPY):				**98.40**		**34.27**		**68.22**		**1.42**		**1.55**		**1.55**		**0.03**
MAXIMUM OPERATING SCHEDULE:		**Hours/Day**	**24**		**Days/Week**		**7**		**Weeks/Year**		**52**		**Hours/Year**		**8,760**	

Notes:
1) Truck loading and fugitive sources are not considered vents. Per TCEQ guidance, MSS activities included under §106.359 do not have to meet the vent height requirements in §106.352(l).
2) Per manufacturer guidance, engine VOC emission factor does not include formaldehyde; therefore, it has been added to this summary to calculate total VOC for the site.

INTRODUCTION

Vital Energy, Inc. operates Benedum Central Tank Battery (Site) in Upton County. With this proposed oil and gas non-rule standard permit registration application, Vital requests continued authorization for the Site. The new project notification was submitted on January 23, 2024. The purpose of this application is to increase throughput, update analyses, and increase fugitive based on a site-specific inventory. There is no receptor within 1 mile of this registration, therefore no further ESL review is required.

The Site consists of four (4) 500-bbl oil storage tanks (OST 01-04), six (6) 500-bbl produced water storage tanks (WST 01-06), one (1) 0.5-mmBtu/hr heater treater (HT-01), one (1) standard flare (FL-01), planned maintenance, startup, and shutdown (MSS) emissions, and emissions from fugitive sources (FUG).

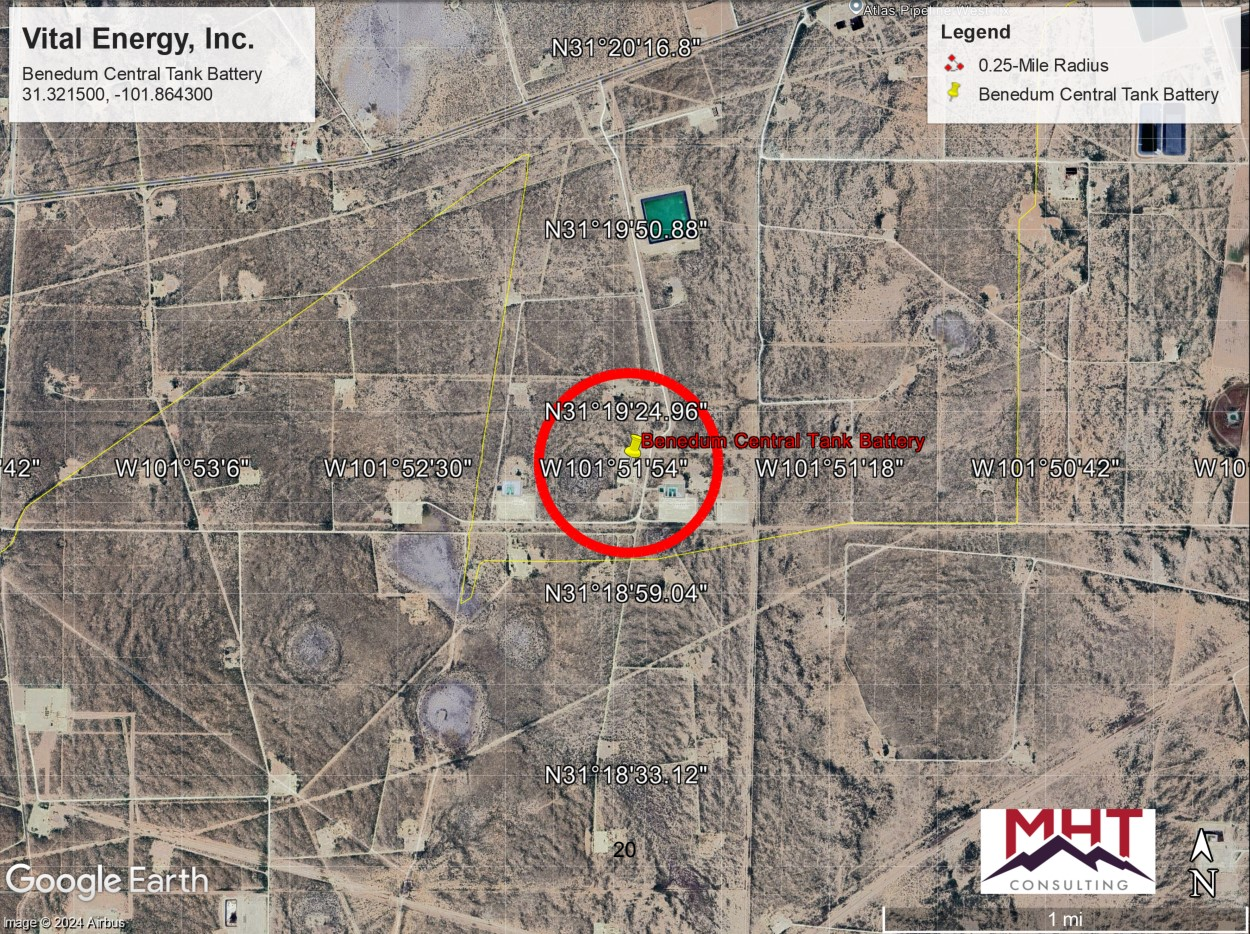
Anticipated production is summarized below:

Oil: 1,500 bbl/d
Produced Water: 4,750 bbl/d
Gas: 2.25 MMSCFD
H_2S: 380 ppm

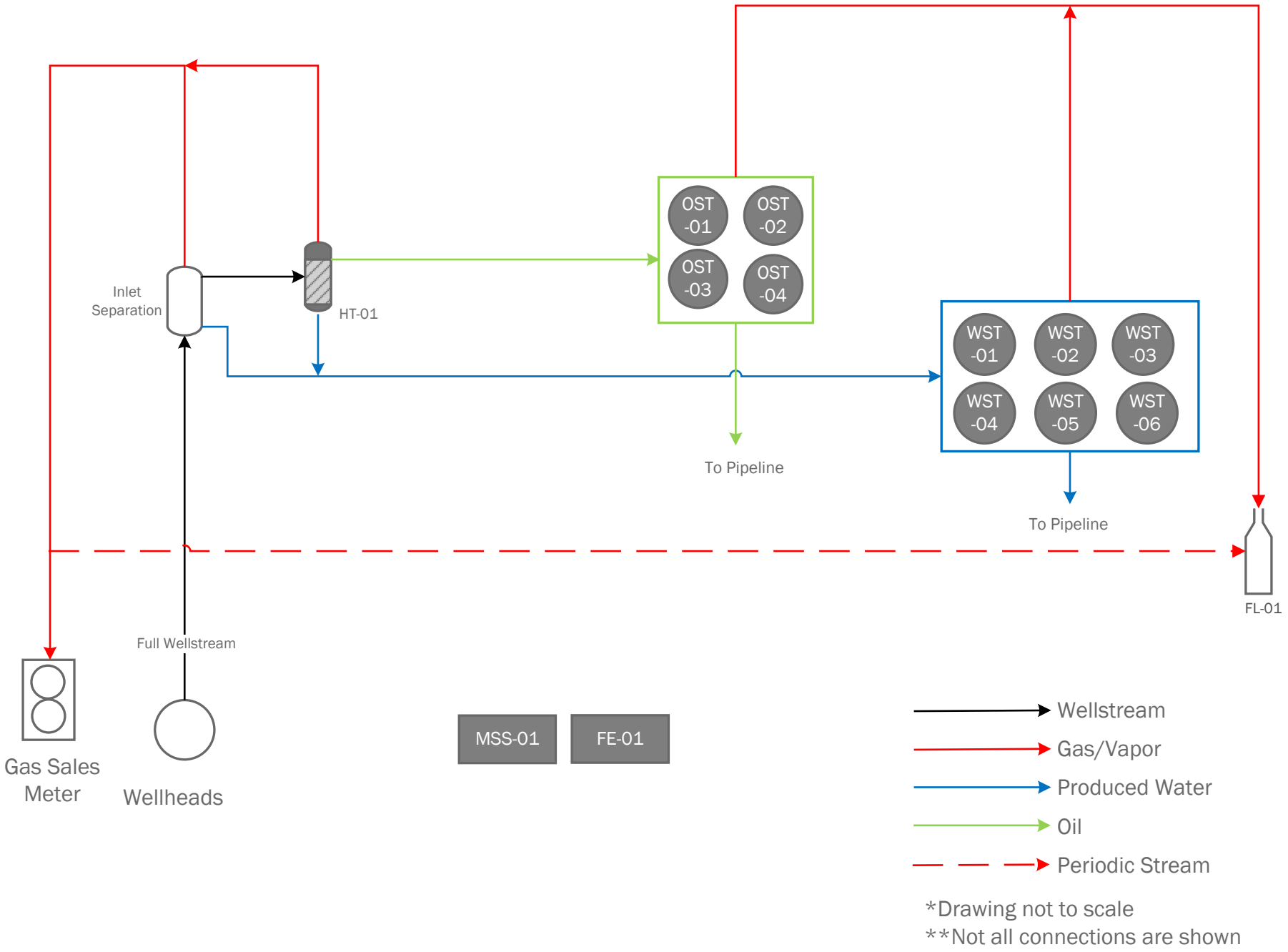
PROCESS DESCRIPTION

The full well stream enters the facility and passes through inlet separation where liquids and gas are separated by mechanical processes. Oil is removed from the inlet natural gas at the inlet separators and is routed through the heater treater prior to being stored in the oil storage tanks. Produced water is removed from the inlet natural gas at the inlet separators and is routed through the heater treater prior to being stored in the produced water storage tanks. Oil and Produced water are transferred offsite via pipeline. Flash vapors from all storage tanks are routed to the standard flare. During sales gas pipeline downtime, the standard flare on site controls stranded gas coming from the pipeline. There are also emissions from MSS and fugitive sources.

MAP AND PROCESS FLOW DIAGRAM


Vital Energy, Inc.
Benedum Central Tank Battery
31.321500, -101.864300
Legend
0.25-Mile Radius
Benedum Central Tank Battery
N31°20'16.8"
N31°19'50.88"
N31°19'24.96"
Benedum Central Tank Battery
'42"
W101°53'6"
W101°52'30"
W101°51'54"
W101°51'18"
W101°50'42"
W10
N31°18'59.04"
N31°18'33.12"
20
MHT
CONSULTING
N
1 mi
Google Earth
Image © 2024 Airbus

Benedum Central Tank Battery - Process Flow Sheet



EMISSIONS CALCULATIONS AND SUPPORT DOCUMENTS

Vital Energy, Inc.
Benedum Central Tank Battery
FACILITY-WIDE CRITERIA EMISSIONS SUMMARY SHEET

EQUIPMENT DESCRIPTION	UNIT ID	Control ID	NOx		CO		TOTAL VOC		SO_2		PM		H_2S	
			LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR
0.50-mmBtu/hr Heater Treater	HT-01	-	0.04	0.16	0.03	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	-	-
500-bbl Oil Tank	OST-01	FL-01	-	-	-	-	0.93	4.07	-	-	-	-	<0.01	<0.01
500-bbl Oil Tank	OST-02	FL-01	-	-	-	-	0.93	4.07	-	-	-	-	<0.01	<0.01
500-bbl Oil Tank	OST-03	FL-01	-	-	-	-	0.93	4.07	-	-	-	-	<0.01	<0.01
500-bbl Oil Tank	OST-04	FL-01	-	-	-	-	0.93	4.07	-	-	-	-	<0.01	<0.01
500-bbl Produced Water Tank	WST-01	FL-01	-	-	-	-	0.02	0.09	-	-	-	-	<0.01	<0.01
500-bbl Produced Water Tank	WST-02	FL-01	-	-	-	-	0.02	0.09	-	-	-	-	<0.01	<0.01
500-bbl Produced Water Tank	WST-03	FL-01	-	-	-	-	0.02	0.09	-	-	-	-	<0.01	<0.01
500-bbl Produced Water Tank	WST-04	FL-01	-	-	-	-	0.02	0.09	-	-	-	-	<0.01	<0.01
500-bbl Produced Water Tank	WST-05	FL-01	-	-	-	-	0.02	0.09	-	-	-	-	<0.01	<0.01
500-bbl Produced Water Tank	WST-06	FL-01	-	-	-	-	0.02	0.09	-	-	-	-	<0.01	<0.01
Standard Flare	FL-01	-	7.79	34.10	15.54	68.09	47.37	73.73	0.83	1.42	0.35	1.54	<0.01	0.02
Fugitive Emissions	FE-01	-	-	-	-	-	1.24	5.42	-	-	-	-	<0.01	0.01
Maintenance, Startup, Shutdown Activities	MSS-01	-	-	-	-	-	186.21	2.46	-	-	-	-	0.03	<0.01
TOTAL =			**7.82**	**34.27**	**15.58**	**68.22**	**238.65**	**98.40**	**0.83**	**1.42**	**0.35**	**1.55**	**0.05**	**0.03**

Vital Energy, Inc.
Benedum Central Tank Battery
FACILITY-WIDE HAZARDOUS AIR POLLUTANT (HAP) EMISSIONS SUMMARY SHEET

EQUIPMENT DESCRIPTION	UNIT ID	AVERAGE HOURLY PTE (LB/HR)						
		BENZENE	ETHYL-BENZENE	N-HEXANE	TOLUENE	XYLENES	OTHER HAP	TOTAL HAP
0.50-mmBtu/hr Heater Treater	HT-01	<0.01	-	<0.01	<0.01	-	<0.01	**<0.01**
500-bbl Oil Tank	OST-01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	**0.04**
500-bbl Oil Tank	OST-02	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	**0.04**
500-bbl Oil Tank	OST-03	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	**0.04**
500-bbl Oil Tank	OST-04	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	**0.04**
500-bbl Produced Water Tank	WST-01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**
500-bbl Produced Water Tank	WST-02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**
500-bbl Produced Water Tank	WST-03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**
500-bbl Produced Water Tank	WST-04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**
500-bbl Produced Water Tank	WST-05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**
500-bbl Produced Water Tank	WST-06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**
Standard Flare	FL-01	0.13	0.02	0.97	0.12	0.07	0.38	**1.70**
Fugitive Emissions	FE-01	<0.01	<0.01	0.02	<0.01	<0.01	0.02	**0.06**
Maintenance, Startup, Shutdown Activities	MSS-01	0.50	0.09	3.86	0.53	0.29	1.51	**6.78**
TOTAL =		**0.64**	**0.15**	**4.89**	**0.69**	**0.41**	**1.91**	**8.69**

Vital Energy, Inc.
Benedum Central Tank Battery
FACILITY-WIDE HAZARDOUS AIR POLLUTANT (HAP) EMISSIONS SUMMARY SHEET

EQUIPMENT DESCRIPTION	UNIT ID	ANNUAL PTE (TPY)						
		BENZENE	ETHYL-BENZENE	N-HEXANE	TOLUENE	XYLENES	OTHER HAP	TOTAL HAP
0.50-mmBtu/hr Heater Treater	HT-01	<0.01	-	<0.01	<0.01	-	<0.01	**<0.01**
500-bbl Oil Tank	OST-01	<0.01	0.04	0.04	0.03	0.05	<0.01	**0.16**
500-bbl Oil Tank	OST-02	<0.01	0.04	0.04	0.03	0.05	<0.01	**0.16**
500-bbl Oil Tank	OST-03	<0.01	0.04	0.04	0.03	0.05	<0.01	**0.16**
500-bbl Oil Tank	OST-04	<0.01	0.04	0.04	0.03	0.05	<0.01	**0.16**
500-bbl Produced Water Tank	WST-01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**
500-bbl Produced Water Tank	WST-02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**
500-bbl Produced Water Tank	WST-03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**
500-bbl Produced Water Tank	WST-04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**
500-bbl Produced Water Tank	WST-05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**
500-bbl Produced Water Tank	WST-06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**
Standard Flare	FL-01	0.20	0.03	1.51	0.19	0.11	0.59	**2.64**
Fugitive Emissions	FE-01	0.01	0.03	0.07	0.03	0.04	0.08	**0.27**
Maintenance, Startup, Shutdown Activities	MSS-01	<0.01	<0.01	0.05	<0.01	<0.01	0.02	**0.08**
	TOTAL =	**0.25**	**0.21**	**1.80**	**0.37**	**0.35**	**0.69**	**3.66**

Vital Energy, Inc.
Benedum Central Tank Battery
HEATER EMISSIONS CALCULATIONS

EQUIPMENT ID	DESCRIPTION	COMBUSTOR TYPE	BURNER DESIGN	FUEL USE	FUEL HHV	ANNUAL HOURS
			MMBTU/HR	MMSCF/YR	BTU/SCF	
HT-01	Heater Treater	UNCONTROLLED	0.50	3.29	1,330	8,760

CRITERIA AIR POLLUTANT EMISSIONS

UNIT ID	POINT ID	NOx		CO		VOC		SO_2		$PM_{10/2.5}$		PM_{COND}		PM_{TOT}	
		HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE
		LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR
EU-HT-01	EP-HT-01	0.04	0.16	0.03	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01

HAZARDOUS AIR POLLUTANT EMISSIONS

UNIT ID	POINT ID	FORMALDEHYDE		N-HEXANE		BENZENE		TOLUENE		OTHER HAP		TOTAL HAP	
		HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE
		LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR
EU-HT-01	EP-HT-01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**	**<0.01**

AP-42 TABLE 1.4 EMISSION FACTORS FOR COMBUSTION UNITS <100 MMBTU/HR (LB/MMSCF) - CRITERIA AIR POLLUTANTS

COMB. TYPE	NOx	CO	VOC	SO_2	$PM_{10/2.5}$	PM_{COND}	PM_{TOT}
UNCONTROLLED	100.0	84.0	5.5	0.6	5.7	1.9	7.6

NOTES:
Per AP-42, all particulate matter (total, condensable and filterable) resulting from combustion of natural gas is assumed <1 micrometer. Total PM is sum of filterable PM and condensable PM.

AP-42 TABLE 1.3 EMISSION FACTORS FOR COMBUSTION UNITS <100 MMBTU/HR (LB/MMSCF) - HAZARDOUS AIR POLLUTANTS

COMB. TYPE	FORMALDEHYDE	N-HEXANE	BENZENE	TOLUENE	OTHER HAP
UNCONTROLLED	7.50E-02	1.80E+00	2.10E-03	3.40E-03	1.90E-03

AP-42 TABLE 1.3 EMISSION FACTORS FOR COMBUSTION UNITS <100 MMBTU/HR (LB/MMBTU) - HAZARDOUS AIR POLLUTANTS

COMB. TYPE	FORMALDEHYDE	N-HEXANE	BENZENE	TOLUENE	OTHER HAP
UNCONTROLLED	7.35E-05	1.76E-03	2.06E-06	3.33E-06	1.86E-06

Vital Energy, Inc.
Benedum Central Tank Battery
STORAGE TANK EMISSIONS CALCULATIONS

EQUIPMENT ID	TANK CONTENTS	CAPACITY		THROUGHPUT			CONTROL DEVICE		
		BBL	GAL	BBL/YR	GAL/YR	BBL/D	TYPE	CAPTURE %	CONTROL %
OST-01	Oil	500	21,000	136,875	5,748,750	375	Flare/Combustor	98.00%	98.00%
OST-02	Oil	500	21,000	136,875	5,748,750	375	Flare/Combustor	98.00%	98.00%
OST-03	Oil	500	21,000	136,875	5,748,750	375	Flare/Combustor	98.00%	98.00%
OST-04	Oil	500	21,000	136,875	5,748,750	375	Flare/Combustor	98.00%	98.00%
TOTAL OIL THROUGHPUT =				**273,750**	**11,497,500**	**1,500**			
WST-01	Produced Water	500	21,000	288,958	12,136,250	792	Flare/Combustor	98.00%	98.00%
WST-02	Produced Water	500	21,000	288,958	12,136,250	792	Flare/Combustor	98.00%	98.00%
WST-03	Produced Water	500	21,000	288,958	12,136,250	792	Flare/Combustor	98.00%	98.00%
WST-04	Produced Water	500	21,000	288,958	12,136,250	792	Flare/Combustor	98.00%	98.00%
WST-05	Produced Water	500	21,000	288,958	12,136,250	792	Flare/Combustor	98.00%	98.00%
WST-06	Produced Water	500	21,000	288,958	12,136,250	792	Flare/Combustor	98.00%	98.00%
TOTAL PRODUCED WATER THROUGHPUT =				**1,733,750**	**72,817,500**	**4,750**			

UNIT ID	POINT ID	VOC WORKING LOSSES			VOC BREATHING LOSSES			VOC FLASHING LOSSES			TOTAL (W+B+F) UNCONTROLLED		TOTAL (W+B+F) CONTROLLED	
		TANKS RESULTS	AVG. HOURLY	ANNUAL PTE	TANKS RESULTS	AVG. HOURLY	ANNUAL PTE	FLASH FACTOR	AVG. HOURLY	ANNUAL PTE	AVG. HOURLY	ANNUAL PTE	AVG. HOURLY	ANNUAL PTE
		LB	LB/HR	TON/YR	LB	LB/HR	TON/YR	LB/BBL	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR
EU-OST-01	EP-OST-01	22,063.05	2.52	11.03	1,627.25	0.19	0.81	1.33	20.73	90.82	23.44	102.66	**0.93**	**4.07**
EU-OST-02	EP-OST-02	22,063.05	2.52	11.03	1,627.25	0.19	0.81	1.33	20.73	90.82	23.44	102.66	**0.93**	**4.07**
EU-OST-03	EP-OST-03	22,063.05	2.52	11.03	1,627.25	0.19	0.81	1.33	20.73	90.82	23.44	102.66	**0.93**	**4.07**
EU-OST-04	EP-OST-04	22,063.05	2.52	11.03	1,627.25	0.19	0.81	1.33	20.73	90.82	23.44	102.66	**0.93**	**4.07**
TOTAL OIL =			**10.07**	**44.13**	**-**	**0.74**	**3.25**	**-**	**82.94**	**363.27**	**93.75**	**410.65**	**3.71**	**16.26**
EU-WST-01	EP-WST-01	1,388.03	0.16	0.69	43.95	<0.01	0.02	0.01	0.34	1.50	0.50	2.21	**0.02**	**0.09**
EU-WST-02	EP-WST-02	1,388.03	0.16	0.69	43.95	<0.01	0.02	0.01	0.34	1.50	0.50	2.21	**0.02**	**0.09**
EU-WST-03	EP-WST-03	1,388.03	0.16	0.69	43.95	<0.01	0.02	0.01	0.34	1.50	0.50	2.21	**0.02**	**0.09**
EU-WST-04	EP-WST-04	1,388.03	0.16	0.69	43.95	<0.01	0.02	0.01	0.34	1.50	0.50	2.21	**0.02**	**0.09**
EU-WST-05	EP-WST-05	1,388.03	0.16	0.69	43.95	<0.01	0.02	0.01	0.34	1.50	0.50	2.21	**0.02**	**0.09**
EU-WST-06	EP-WST-06	1,388.03	0.16	0.69	43.95	<0.01	0.02	0.01	0.34	1.50	0.50	2.21	**0.02**	**0.09**
TOTAL PRODUCED WATER =			**0.95**	**4.16**	**-**	**0.03**	**0.13**	**-**	**2.05**	**8.97**	**3.03**	**13.27**	**0.12**	**0.53**

UNCONTROLLED HAZARDOUS AIR POLLUTANT EMISSIONS

UNIT ID	POINT ID	N-HEXANE		BENZENE		TOLUENE		ETHYLBENZENE		XYLENES		H_2S		TOTAL HAP	
		AVG. HOURLY	ANNUAL PTE	AVG. HOURLY	ANNUAL PTE	AVG. HOURLY	ANNUAL PTE	AVG. HOURLY	ANNUAL PTE	AVG. HOURLY	ANNUAL PTE	AVG. HOURLY	ANNUAL PTE	AVG. HOURLY	ANNUAL PTE
		LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR
EU-OST-01	EP-OST-01	0.22	0.98	0.05	0.21	0.19	0.85	0.20	0.89	0.26	1.15	<0.01	<0.01	**0.93**	**4.09**
EU-OST-02	EP-OST-02	0.22	0.98	0.05	0.21	0.19	0.85	0.20	0.89	0.26	1.15	<0.01	<0.01	**0.93**	**4.09**
EU-OST-03	EP-OST-03	0.22	0.98	0.05	0.21	0.19	0.85	0.20	0.89	0.26	1.15	<0.01	<0.01	**0.93**	**4.09**
EU-OST-04	EP-OST-04	0.22	0.98	0.05	0.21	0.19	0.85	0.20	0.89	0.26	1.15	<0.01	<0.01	**0.93**	**4.09**
TOTAL OIL =		**0.90**	**3.93**	**0.19**	**0.85**	**0.78**	**3.40**	**0.82**	**3.57**	**1.05**	**4.61**	**<0.01**	**<0.01**	3.73	16.36
EU-WST-01	EP-WST-01	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01	0.02	<0.01	<0.01	**0.02**	**0.09**
EU-WST-02	EP-WST-02	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01	0.02	<0.01	<0.01	**0.02**	**0.09**
EU-WST-03	EP-WST-03	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01	0.02	<0.01	<0.01	**0.02**	**0.09**
EU-WST-04	EP-WST-04	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01	0.02	<0.01	<0.01	**0.02**	**0.09**
EU-WST-05	EP-WST-05	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01	0.02	<0.01	<0.01	**0.02**	**0.09**
EU-WST-06	EP-WST-06	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01	0.02	<0.01	<0.01	**0.02**	**0.09**
TOTAL PW =		**0.03**	**0.13**	**<0.01**	**0.03**	**0.03**	**0.11**	**0.03**	**0.12**	**0.03**	**0.15**	**<0.01**	**<0.01**	0.12	0.53

CONTROLLED HAZARDOUS AIR POLLUTANT EMISSIONS

UNIT ID	POINT ID	N-HEXANE		BENZENE		TOLUENE		ETHYLBENZENE		XYLENES		H_2S		TOTAL HAP	
		AVG. HOURLY	ANNUAL PTE	AVG. HOURLY	ANNUAL PTE	AVG. HOURLY	ANNUAL PTE	AVG. HOURLY	ANNUAL PTE	AVG. HOURLY	ANNUAL PTE	AVG. HOURLY	ANNUAL PTE	AVG. HOURLY	ANNUAL PTE
		LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR
EU-OST-01	EP-OST-01	<0.01	0.04	<0.01	<0.01	<0.01	0.03	<0.01	0.04	0.0104	0.05	<0.01	<0.01	**0.04**	**0.16**
EU-OST-02	EP-OST-02	<0.01	0.04	<0.01	<0.01	<0.01	0.03	<0.01	0.04	0.0104	0.05	<0.01	<0.01	**0.04**	**0.16**
EU-OST-03	EP-OST-03	<0.01	0.04	<0.01	<0.01	<0.01	0.03	<0.01	0.04	0.0104	0.05	<0.01	<0.01	**0.04**	**0.16**
EU-OST-04	EP-OST-04	<0.01	0.04	<0.01	<0.01	<0.01	0.03	<0.01	0.04	0.0104	0.05	<0.01	<0.01	**0.04**	**0.16**
TOTAL OIL =		**0.04**	**0.16**	**<0.01**	**0.03**	**0.03**	**0.13**	**0.03**	**0.14**	**0.04**	**0.18**	**<0.01**	**<0.01**	**0.15**	**0.65**
EU-WST-01	EP-WST-01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**	**<0.01**
EU-WST-02	EP-WST-02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**	**<0.01**
EU-WST-03	EP-WST-03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**	**<0.01**
EU-WST-04	EP-WST-04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**	**<0.01**
EU-WST-05	EP-WST-05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**	**<0.01**
EU-WST-06	EP-WST-06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**<0.01**	**<0.01**
TOTAL PW =		**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**0.02**

HAP COMPOSITION (% BY WEIGHT)

POLLUTANT	N-HEXANE	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	H_2S	TOTAL HAP
WEIGHT %	0.96%	0.21%	0.83%	0.87%	1.12%	0.000%	**3.98%**

NOTES:

1) Working and breathing losses calculated using AP-42 equations and EPA Tanks 4.0.9d data. Flashing losses calculated with Promax process simulation software.
2) Produced water conservatively assumed to contain 1% condensate modeled as Crude Oil RVP 6.
3) Due to variable short-term emission rates, average lb/hr based on annual emissions shown for reference only.
4) HAP composition estimated using analyses.

Vital Energy, Inc.
Benedum Central Tank Battery
STORAGE TANK WORKING AND BREATHING AP-42 RESULTS

Tank Group	OST-01 Through OST-04	WST-01 Through WST-06
Throughput Per Tank (gal/yr)	5,748,750	12,136,250
Nearest City:	Midland, TX	Midland, TX
Annual Avg. Max Temp (TAX): oF	76.70	76.70
Annual Avg. Min Temp (TAN): oF	51.40	51.40
Daily Avg. Ambient Temp (TAA): oR	523.72	523.72
Daily Ambient Temp Range (ΔTA): oR	25.30	25.30
Annual Avg. Solar (I): Btu/(ft2 day)	1,698.00	1,698.00
Shell Color:	Tan	Tan
Shell Condition:	Average	Average
Shell Paint Factor (αS):	0.49	0.49
Roof Color:	Tan	Tan
Roof Condition:	Average	Average
Roof Paint Factor (αR):	0.49	0.49
Liquid Bulk Temp (TB): oR	526.22	526.22
Daily Vapor Temp Range (ΔTV): oR	35.39	35.39
Daily Avg. Surface Temp (TLA): oR	**528.64**	**528.64**
Average Vapor Temperature (TV): oR	**531.06**	**531.06**
Reid Vapor Pressure (RVP): psia	6.00	6.00
Modeled As:	Crude oil	Crude oil
Material Stored:	Crude oil RVP 6	Crude oil RVP 6
Vapor MW (MV1): lb/lb-mol	50.00	50.00
Liquid MW (ML1): lb/lb-mol	207.00	207.00
TVP at Daily Avg. Surface Temp (P1): psia	4.36	4.36
Constant A:	11.09	11.09
Constant B: oR	5,082.22	5,082.22
Percent Water: %	0.00%	99.00%
Liquid Mole Ratio of VOL (x1):	1.00	0.00
Liquid Mole Ratio of Water (x2):	0.00	1.00
TVP at Daily Avg. Surface Temp (P2): psia	0.35	0.35
Combined TVP @ TLA (PVA): psia	**4.36**	**0.35**
Combined Vapor MW (MV): lb/lb-mol	**50.00**	**18.37**
Atmospheric Pressure (PA): psia	13.26	13.26
Breather Vent Pressure (PBP): psia	0.03	0.03
Breather Vent Vacuum (PBV): psia	(0.03)	(0.03)
Breather Vent Pres. Setting Range (ΔPB): psia	0.06	0.06
Roof Type:	Cone	Cone
Shell Height (HS): ft	16.00	16.00

Shell Diameter (D): ft	15.50	15.50
Tank Shell Radius (RS): ft	7.75	7.75
Liquid Height (HL): ft	8.00	8.00
Cone Roof Slop: ft/ft	0.06	0.06
Tank Cone Roof Height (HR): ft	0.48	0.48
Cone Roof Outage (HRO): ft	0.16	0.16
Tank Dome Radius (RR): ft	15.50	15.50
Tank Dome Roof Height (HR): ft	2.08	2.08
Cone Dome Outage (HRO): ft	1.06	1.06
Vapor Space Outage (HVO): ft	8.16	8.16
Tank Vapor Space Volume (VV): ft3	**1,540.00**	**1,540.00**
Vented Vapor Saturation Factor (KS):	**0.3463**	**0.8672**
Daily Max Surface Temp (TLX): oR	537.49	537.49
TVP at Daily Max Surface Temp (PX1): psia	5.11	5.11
TVP at Daily Max Surface Temp (PX2): psia	0.47	0.47
Combined TVP @ TLX (PVX): psia	5.11	0.48
Daily Min Surface Temp (TLN): oR	519.79	519.79
TVP at Daily Min Surface Temp (PN1): psia	3.70	3.70
TVP at Daily Min Surface Temp (PN2): psia	0.26	0.26
Combined TVP @ TLX (PVX): psia	3.70	0.26
Daily Vapor Pressure Range (ΔPV): psia	1.41	0.22
Vapor Space Expansion Factor (KE):	**0.2183**	**0.0790**
Ideal Gas Law Constant (R): psia ft3/ lb-mole oR	10.73	10.73
Stock Vapor Density (WV): lb/ft3	**0.0383**	**0.0011**
Throughput (Q): bbl/yr/tank	136,875.00	288,958.33
Maximum Liquid Height (HLX): ft	15.00	15.00
Tank Max Liquid Volume (VLX): ft3	2,830.38	2,830.38
Tank Capacity: gallons	21,000.00	21,000.00
Override Working Volume Calculation?: -	Yes	Yes
Number of Turnovers per year (N):	290.88	614.08
Annual Sum of Liquid Level Incease (∑HQI): ft/yr	4,072.33	8,597.15
Net Working Loss Throughput (VQ): ft3/yr	**768,416.25**	**1,622,212.08**
Working Loss Turnover Factor (KN):	**1.00**	**1.00**
Working Loss Product Factor (KP):	**0.75**	**0.75**
Vent Setting Correction Factor (KB):	**1.00**	**1.00**
Standing Storage Loss (LS): lb/yr	**1,627.25**	**43.95**
Working Loss (LW): lb/yr	**22,063.05**	**1,388.03**

Vital Energy, Inc.
Benedum Central Tank Battery
FLARE EMISSIONS CALCULATIONS

EQUIPMENT ID	DESCRIPTION	STREAM HHV	STREAM NET BTU	THROUGHPUT	COMBUSTION EFFICIENCY	ANNUAL HOURS
		BTU/SCF	BTU/HR	MMSCF/YR		
FL-01	Standard Flare	1,221	56,423,564.20	404.81	98.00%	8,760

CRITERIA AIR POLLUTANT EMISSIONS

EQUIPMENT ID	NOx		CO		VOC		SO_2		PM_{TOT}		Pilot Emissions Only NOx		Pilot Emissions Only CO	
	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE
	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR
FL-01	7.79	34.10	15.54	68.09	47.37	73.73	0.83	1.42	0.35	1.54	0.01	0.05	0.02	0.10

HAZARDOUS AIR POLLUTANT EMISSIONS

EQUIPMENT ID	N-HEXANE		BENZENE		TOLUENE		ETHYLBENZENE		XYLENES		2,2,4-TRIMETH.		TOTAL HAP	
	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE
	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR
FL-01	0.97	1.51	0.13	0.20	0.12	0.19	0.02	0.03	0.07	0.11	0.38	0.59	**1.70**	**2.64**

EMISSION FACTORS FOR COMBUSTION UNITS <100 MMBTU/HR (LB/MMSCF) - CRITERIA AIR POLLUTANTS

STREAM HHV	NOx	CO	SO_2	PM_{TOT}
BTU/SCF	LB/MMBTU	LB/MMBTU	LB/MMSCF	LB/MMSCF
TCEQ HIGH BTU (>1,000)	0.138	0.2755	0.6	7.6
TCEQ LOW BTU (<1,000)	0.0641	0.5496	0.6	7.6

40 CFR §60.18 VELOCITY CALCULATION

EQUIPMENT ID	DIAMETER	STREAM FLOW	STREAM NET BTU	THROUGHPUT	TIP AREA	VELOCITY
	INCHES	SCFD	SCFH	SCFS	SQ FEET	FPS
FL-01	4	3,011,412	125,475.51	34.85	0.09	399.40

30 TAC §106.492 (1)(D) HEAT RELEASE CALCULATION

EQUIPMENT ID	SO_2	Q	ACTUAL Q	COMPLIANT?
	LB/HR	BTU/HR	BTU/HR	YES/NO
FL-01	0.83	43,809.50	56,423,564.20	YES

NOTES:

1) NOx and CO: TCEQ Air Permit Technical Guidance For Chemical Sources: Flares And Vapor Oxidizers. SO2: Stoichiometric. PM: AP-42 Table 1.4. VOC and H2S emissions based on composition of all streams routed to flare and noted combustion efficiency.

2) Uncaptured and uncombusted emissions from the tanks are shown at the tanks.

Vital Energy, Inc.
Benedum Central Tank Battery
Flare Emissions Calculations - Flare Stream Analysis

FL-01

Components	Mol Wt	Pilot Gas 65 scfh Mole%	Pilot Gas 65 scfh lb/hr	Tank Vapors 1,625 scfh Mole%	Tank Vapors 1,625 scfh lb/hr	Tank Vapors 8760 hrs TPY	Stranded Gas	Stranded Gas lb/hr	Stranded Gas TPY	Total Streams Burned in Flare Uncontrolled lb/hr	Uncontrolled tons/yr	Total Streams Burned in Flare scf/hr	Controlled Emissions lb/hr	Controlled Emissions tons/yr	Component Net Heating Value Btu/scf	Maximum Net Btu Value Rate Btu/hr	Average Net Btu Value Rate Btu/hr
Hydrogen Sulfide	34.082	0.004%	<0.01	0.017%	0.03	0.11	0.004%	0.42	0.66	0.45	0.77	5	0.01	0.02	637.11	3,178	1,245
Water	18.015	0.000%	<0.01	0.926%	1.75	7.64	0.000%	<0.01	<0.01	1.75	7.64	37	0.03	0.15	0.00	0	0
Carbon Dioxide	44.010	0.317%	0.02	0.292%	0.35	1.53	0.317%	45.49	70.74	45.86	72.38	395	0.92	1.45	0.00	0	0
Nitrogen	28.013	3.185%	0.15	4.106%	3.17	13.87	3.185%	291.13	452.71	294.45	467.25	3,988	5.89	9.35	0.00	0	0
Helium	4.003	0.000%	<0.01	0.000%	<0.01	<0.01	0.000%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.00	0	0
Oxygen	31.999	0.000%	<0.01	0.000%	<0.01	<0.01	0.000%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.00	0	0
Methane	16.042	73.167%	2.01	26.947%	18.51	81.06	73.167%	3829.67	5955.14	3,850.19	6,045.00	91,059	77.00	120.90	919.00	83,682,809	29,996,930
Ethane	30.069	10.294%	0.53	22.590%	29.08	127.37	10.294%	1009.93	1570.44	1,039.54	1,700.13	13,117	20.79	34.00	1,619.00	21,235,689	7,929,278
Propane	44.096	7.197%	0.54	24.856%	46.92	205.51	7.197%	1035.52	1610.23	1,082.98	1,818.12	9,318	21.66	36.36	2,315.00	21,570,979	8,267,951
i-Butane	58.122	0.675%	0.07	2.573%	6.40	28.04	0.675%	127.95	198.96	134.42	227.30	877	2.69	4.55	3,000.00	2,632,317	1,016,241
n-Butane	58.122	2.536%	0.25	9.917%	24.68	108.08	2.536%	480.96	747.90	505.89	857.09	3,302	10.12	17.14	3,011.00	9,943,198	3,846,086
i-Pentane	72.149	0.559%	0.07	2.193%	6.77	29.67	0.559%	131.47	204.44	138.32	234.42	727	2.77	4.69	3,699.00	2,690,477	1,041,033
n-Pentane	72.149	0.645%	0.08	2.297%	7.09	31.07	0.645%	151.81	236.07	158.99	267.49	836	3.18	5.35	3,707.00	3,099,204	1,190,473
Cyclopentane	70.100	0.077%	<0.01	0.071%	0.21	0.93	0.077%	17.70	27.53	17.93	28.50	97	0.36	0.57	3,512.10	340,739	123,700
n-Hexane	86.175	0.173%	0.03	0.324%	1.19	5.23	0.173%	48.61	75.60	49.83	80.94	219	1.00	1.62	4,404.00	966,244	358,288
Cyclohexane	84.160	0.105%	0.02	0.037%	0.13	0.58	0.105%	28.70	44.62	28.84	45.27	130	0.58	0.91	4,179.70	543,460	194,728
Other Hexanes	86.175	0.418%	0.06	1.475%	5.44	23.83	0.418%	117.61	182.89	123.12	206.99	542	2.46	4.14	4,404.00	2,387,160	916,321
Heptanes (as n-Heptane)	100.202	0.325%	0.06	0.717%	3.07	13.46	0.325%	106.32	165.33	109.45	179.03	414	2.19	3.58	5,100.00	2,113,499	789,308
Benzene	78.114	0.025%	<0.01	0.098%	0.33	1.44	0.025%	6.32	9.83	6.65	11.28	32	0.13	0.23	3,590.90	116,022	44,920
Toluene	92.141	0.020%	<0.01	0.094%	0.37	1.62	0.020%	6.01	9.35	6.38	10.98	26	0.13	0.22	4,273.60	112,322	44,113
Ethylbenzene	106.167	0.003%	<0.01	0.026%	0.12	0.52	0.003%	1.07	1.67	1.19	2.19	4	0.02	0.04	4,970.50	21,184	8,881
Xylenes	106.500	0.011%	<0.01	0.031%	0.14	0.62	0.011%	3.65	5.67	3.79	6.30	14	0.08	0.13	4,957.10	66,965	25,408
Octanes (as n-Octane)	114.229	0.137%	0.03	0.213%	1.04	4.57	0.137%	51.02	79.34	52.09	84.03	173	1.04	1.68	4,273.60	739,420	272,301
2,2,4-Trimethylpentane	114.230	0.051%	0.01	0.140%	0.69	3.01	0.051%	19.05	29.62	19.74	32.66	66	0.39	0.65	4,943.70	324,152	122,453
Nonanes (as n-Nonane)	128.255	0.053%	0.01	0.060%	0.33	1.43	0.053%	22.35	34.75	22.69	36.23	67	0.45	0.72	6,493.00	435,722	158,889
Decanes+ (as n-Decane)	142.282	0.024%	<0.01	<0.001%	<0.01	<0.01	0.024%	11.00	17.11	11.01	17.14	29	0.22	0.34	7,190.00	211,067	75,015
Total =		100.000%	3.96	100.000%	157.81	691.20	100.000%	7,543.78	11,730.58	7,705.55	12,439.13	125,476	-	-	Btu/hr	153,235,807	56,423,564
Total VOC =		13.033%	1.24	45.121%	104.93	459.62	13.033%	2,367.13	3,680.89	2,473.31	4,145.95	-	47.37	73.73	Heat Value (Btu/scf)	1,221	
Total HAP =										87.60	144.35	-	1.70	2.64			
Total H_2S =										0.45	0.77	-	0.01	0.02			
MW (Stream) =												23.30					

Vital Energy, Inc.
Benedum Central Tank Battery
FUGITIVE COMPONENT EMISSIONS CALCULATIONS

EQUIPMENT ID	SERVICE	COMPONENT TYPE	COMPONENT COUNT	EM. FACTOR (LB/HR/COMP.)	CONTROL EFFICIENCY	TOC	
						LB/HR	TPY
FE-01	GAS	VALVES	66	0.009921	0.00%	0.65	2.87
FE-01	GAS	CONNECTORS	206	0.000441	0.00%	0.09	0.40
FE-01	GAS	FLANGES	137	0.000860	0.00%	0.12	0.52
					TOTAL TOC (GAS COMPONENTS) =	**1.47**	**6.42**
FE-01	LIGHT_OIL	VALVES	81	0.005511	0.00%	0.45	1.96
FE-01	LIGHT_OIL	CONNECTORS	218	0.000463	0.00%	0.10	0.44
FE-01	LIGHT_OIL	FLANGES	146	0.000243	0.00%	0.04	0.16
					TOTAL TOC (LIQUID COMPONENTS) =	**0.79**	**3.44**
FE-01	WATER_OIL	VALVES	57	0.000216	0.00%	0.01	0.05
FE-01	WATER_OIL	CONNECTORS	192	0.000243	0.00%	0.05	0.20
FE-01	WATER_OIL	FLANGES	128	0.000006	0.00%	0.00	0.00
					TOTAL TOC (LIQUID COMPONENTS) =	**0.16**	**0.68**

COMPONENT TYPE/SERVICE	VOC		
	HOURLY PTE	ANNUAL PTE	
	LB/HR	TON/YR	LB/YR
VALVES-GAS	0.20	0.89	1,784.36
CONNECTORS-GAS	0.03	0.12	247.53
FLANGES-GAS	0.04	0.16	321.00
TOTAL (GAS) =	**0.46**	**2.00**	**3,996.66**
VALVES-LIGHT_OIL	0.44	1.94	3,884.06
CONNECTORS-LIGHT_OIL	0.10	0.44	878.09
FLANGES-LIGHT_OIL	0.04	0.15	308.04
TOTAL (LIQUID) =	**0.78**	**3.42**	**6,830.97**
VALVES-WATER_OIL	<0.01	<0.01	1.08
CONNECTORS-WATER_OIL	<0.01	<0.01	4.08
FLANGES-WATER_OIL	<0.01	<0.01	0.07
TOTAL (LIQUID) =	**<0.01**	**<0.01**	**13.68**
TOTAL (ALL COMPONENTS) =	**1.24**	**5.42**	**10,841.31**

COMPONENT TYPE/SERVICE	N-HEXANE		BENZENE		TOLUENE		ETHYLBENZENE		XYLENES		2,2,4-TRIMETH.		TOTAL HAP	
	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE	HOURLY PTE	ANNUAL PTE
	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR
VALVES-GAS	<0.01	0.0186	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0326
CONNECTORS-GAS	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FLANGES-GAS	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TOTAL (GAS) =	**<0.01**	**0.0416**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**0.0163**	**0.0167**	**0.0730**
VALVES-LIGHT_OIL	<0.01	0.0187	<0.01	<0.01	<0.01	0.0162	<0.01	0.0170	<0.01	0.0220	<0.01	0.0354	0.0259	0.1132
CONNECTORS-LIGHT_OIL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0256
FLANGES-LIGHT_OIL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TOTAL (LIQUID) =	**<0.01**	**0.0329**	**<0.01**	**<0.01**	**<0.01**	**0.0284**	**<0.01**	**0.0299**	**<0.01**	**0.0386**	**0.0142**	**0.0622**	**0.0455**	**0.1992**
VALVES-WATER_OIL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CONNECTORS-WATER_OIL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FLANGES-WATER_OIL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TOTAL (LIQUID) =	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**
TOTAL (ALL COMPONENTS) =	**0.0170**	**0.0745**	**<0.01**	**0.0125**	**<0.01**	**0.0341**	**<0.01**	**0.0308**	**<0.01**	**0.0418**	**0.0179**	**0.0785**	**0.0621**	**0.2721**

POLLUTANT COMPOSITION BY STREAM (% BY WEIGHT)

POLLUTANT	VOC
GAS WEIGHT %	31.1096%
LIQUID WEIGHT %	99.3185%
WATER WEIGHT %	1.00%

POLLUTANT	N-HEXANE	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	2,2,4-TRIMETH.	TOTAL HAP	H_2S
GAS WEIGHT %	0.6470%	0.0841%	0.0887%	0.0143%	0.0484%	0.2535%	**1.1359%**	**0.0056%**
LIQUID WEIGHT %	0.9564%	0.2065%	0.8268%	0.8698%	1.1237%	1.8081%	**5.7914%**	**0.0000%**
WATER WEIGHT %	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	**0.0000%**	**0.0000%**

NOTES:

1) EPA-453/R-95-017 Emission Factors

2) Total organic compound (TOC) emission rates multiplied by weight % of component to obtain emissions.

3) Gas and liquids analyses attached.

Vital Energy, Inc.
Benedum Central Tank Battery
MAINTENANCE, STARTUP, AND SHUTDOWN (MSS) EMISSIONS - MAINTENANCE EVENTS

MAINTENANCE ACTIVITY	EVENTS		VOLUME PER EVENT	ANALYSIS SPECIFIC GRAVITY	STREAM DENSITY
	PER YEAR	PER HOUR	SCF		LB/SCF
PIG MSS	52	1	3,061	0.9720	0.074
PIPELINE DEGASSING	1	1	4,286	0.9720	0.074
TANK DEGASSING	10	0.25	2,807	0.9720	0.074

MAINTENANCE ACTIVITY	VOC		H_2S	
	LB/HR	TON/YR	LB/HR	TON/YR
PIG MSS	70.66	1.84	0.01	<0.01
PIPELINE DEGASSING	98.92	0.05	0.02	<0.01
TANK DEGASSING	16.20	0.32	<0.01	<0.01
TOTAL =	**185.78**	**2.46**	**0.03**	**<0.01**

MAINTENANCE ACTIVITY	N-HEXANE		BENZENE		TOLUENE		ETHYLBENZENE		XYLENES		2,2,4-TRIMETH.		TOTAL HAP	
	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR	LB/HR	TON/YR
PIG MSS	1.47	0.04	0.19	<0.01	0.20	<0.01	0.03	<0.01	0.11	<0.01	0.58	0.01	2.58	0.07
PIPELINE DEGASSING	2.06	<0.01	0.27	<0.01	0.28	<0.01	0.05	<0.01	0.15	<0.01	0.81	<0.01	3.61	<0.01
FILTER OPENING	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TANK DEGASSING	0.34	<0.01	0.04	<0.01	0.05	<0.01	<0.01	<0.01	0.03	<0.01	0.13	<0.01	0.59	0.01
GUNBARREL DEGASSING	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TOTAL =	**3.86**	**0.05**	**0.50**	**<0.01**	**0.53**	**<0.01**	**0.09**	**<0.01**	**0.29**	**<0.01**	**1.51**	**0.02**	**6.78**	**0.08**

POLLUTANT COMPOSITION BY STREAM (% BY WEIGHT)

POLLUTANT	VOC		H_2S
INLET GAS WT %	31.11%		0.0056%

POLLUTANT	N-HEXANE	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	2,2,4-TRIMETH.	TOTAL HAP
INLET GAS WT %	0.65%	0.08%	0.09%	0.01%	0.05%	0.25%	**1.14%**

Vital Energy, Inc.
Benedum Central Tank Battery
MAINTENANCE, STARTUP, AND SHUTDOWN (MSS) EMISSIONS - TANK CLEANING

Collected Material	Saturation Factor	Max Vapor Pressure (psia)	Average Vapor Pressure (psia)	Vapor Molec. Wt. (lb/mole)	Max Temperature (°F)	Average Temperature (°F)	Tank Volume (Mgal)	Liquid Heel (% Volume of Tank)	Amount Loaded (Mgal)	VOC Fraction	Max Loading Loss (lb/Mgal)	Average Loading Loss (lb/Mgal)	Safety Factor	Activities/Year	Hourly VOC PTE (lb/hr)	Annual VOC (tpy)
Sump Cleanout	0.60	5.11	4.36	66	77.82	68.97	-	-	0.085	0.0099	4.69	4.07	100%	1	<0.01	<0.01
Oil/Condensate	0.60	5.11	4.36	66	77.82	68.97	21.00	0.20	4.200	0.0099	4.69	4.07	100%	1	0.3912	<0.01
Oil/Condensate	0.60	5.11	4.36	66	77.82	68.97	21.00	0.20	4.200	0.0099	4.69	4.07	100%	1	0.3912	<0.01
Oil/Condensate	0.60	5.11	4.36	66	77.82	68.97	21.00	0.20	4.200	0.0099	4.69	4.07	100%	1	0.3912	<0.01
Oil/Condensate	0.60	5.11	4.36	66	77.82	68.97	21.00	0.20	4.200	0.0099	4.69	4.07	100%	1	0.3912	<0.01
Produced Water	0.60	0.48	0.35	66	77.82	68.97	21.00	0.20	4.200	0.0099	0.44	0.33	100%	1	0.0364	<0.01
Produced Water	0.60	0.48	0.35	66	77.82	68.97	21.00	0.20	4.200	0.0099	0.44	0.33	100%	1	0.0364	<0.01
Produced Water	0.60	0.48	0.35	66	77.82	68.97	21.00	0.20	4.200	0.0099	0.44	0.33	100%	1	0.0182	<0.01
Produced Water	0.60	0.48	0.35	66	77.82	68.97	21.00	0.20	4.200	0.0099	0.44	0.33	100%	1	0.0182	<0.01
Produced Water	0.60	0.48	0.35	66	77.82	68.97	21.00	0.20	4.200	0.0099	0.44	0.33	100%	1	0.0182	<0.01
Produced Water	0.60	0.48	0.35	66	77.82	68.97	21.00	0.20	4.200	0.0099	0.44	0.33	100%	1	0.0182	<0.01
														Total:	**0.44**	**<0.01**

Bryan Research & Engineering, LLC

ProMax® 6.0

Simulation Report

Project: Benedum_Promax Model kmi.pmx

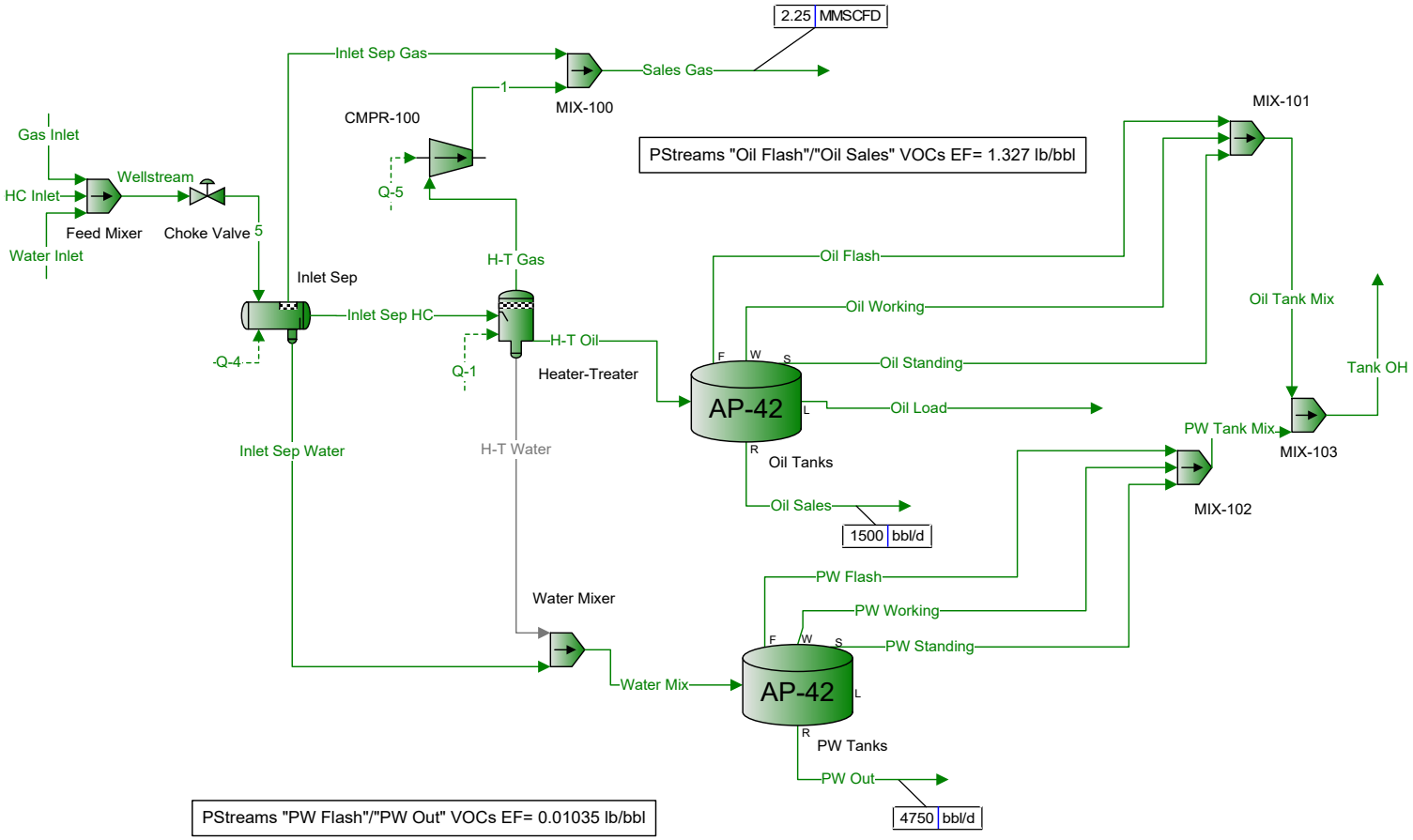
Licensed to MHT Consultants, LLC and Affiliates

Client Name: Vital
Location: Benedum Central Tank Battery
Job:

ProMax Filename: G:\Shared drives\Environmental Departments\Air Permitting\Vital (fka Laredo)\Benedum Central Tank Battery\2024-01 NRSP\Working Files\Benedum_Promax Model kmi.pmx
ProMax Version: 6.0.24240.0
Simulation Initiated: 12/2/2024 11:36:36 AM

Bryan Research & Engineering, LLC
Chemical Engineering Consultants
P.O. Box 4747 Bryan, Texas 77805
Office: (979) 776-5220
FAX: (979) 776-4818
mailto:sales@bre.com
http://www.bre.com/

Report Navigator can be activated via the ProMax Navigator Toolbar.
An asterisk (*), throughout the report, denotes a user specified value.
A question mark (?) after a value, throughout the report, denotes an extrapolated or approximate value.


2.25 MMSCFD
Inlet Sep Gas
Sales Gas
1
MIX-100
CMPR-100
MIX-101
Gas Inlet
HC Inlet
Water Inlet
Wellstream
Feed Mixer
Choke Valve
5
Q-5
PStreams "Oil Flash"/"Oil Sales" VOCs EF= 1.327 lb/bbl
Oil Flash
Oil Working
Oil Standing
Oil Load
Oil Tank Mix
Tank OH
Inlet Sep
H-T Gas
Inlet Sep HC
H-T Oil
Heater-Treater
Q-4
Q-1
F
W
S
AP-42
L
R
Oil Tanks
Oil Sales
1500 bbl/d
PW Tank Mix
MIX-103
MIX-102
Inlet Sep Water
H-T Water
Water Mixer
PW Flash
PW Working
PW Standing
Water Mix
AP-42
PW Tanks
PW Out
4750 bbl/d
PStreams "PW Flash"/"PW Out" VOCs EF= 0.01035 lb/bbl

Process Streams		Tank OH
Composition	**Status:**	**Solved**
Phase: **Total**	**From Block:**	**MIX-103**
	To Block:	**--**
Mole Fraction		**%**
Carbon Dioxide		0.926389
Hydrogen Sulfide		0.0173405
H2O		4.10620
Nitrogen		0.291743
Methane		26.9470
Ethane		22.5903
Propane		24.8555
Isobutane		2.57290
n-Butane		9.91745
2,2-Dimethylpropane		0
Isopentane		2.19322
n-Pentane		2.29653
2,2-Dimethylbutane		0
Cyclopentane		0.0710600
2,3-Dimethylbutane		0
2-Methylpentane		0
3-Methylpentane		1.47506
n-Hexane		0.323615
Methylcyclopentane		0
Benzene		0.0981483
Cyclohexane		0.0366454
2-Methylhexane		0
3-Methylhexane		0
2,2,4-Trimethylpentane		0.140305
Heptane		0.701589
Methylcyclohexane		0.0150759
Toluene		0.0938353
Octane		0.213204
Ethylbenzene		0.0260042
o-Xylene		0.00807104
p-Xylene		0.0230659
Nonane		0.0595847
Decane		0.000124025
Benners C10+		5.19711E-07
Molar Flow		**lbmol/h**
Carbon Dioxide		0.0396586
Hydrogen Sulfide		0.000742347
H2O		0.175786
Nitrogen		0.0124895
Methane		1.15360
Ethane		0.967086
Propane		1.06406
Isobutane		0.110146
n-Butane		0.424565
2,2-Dimethylpropane		0
Isopentane		0.0938913
n-Pentane		0.0983141
2,2-Dimethylbutane		0
Cyclopentane		0.00304207
2,3-Dimethylbutane		0
2-Methylpentane		0
3-Methylpentane		0.0631472
n-Hexane		0.0138539
Methylcyclopentane		0
Benzene		0.00420171
Cyclohexane		0.00156878
2-Methylhexane		0
3-Methylhexane		0
2,2,4-Trimethylpentane		0.00600644
Heptane		0.0300349
Methylcyclohexane		0.000645396
Toluene		0.00401708
Octane		0.00912725
Ethylbenzene		0.00111324
o-Xylene		0.000345520
p-Xylene		0.000987449
Nonane		0.00255081
Decane		5.30949E-06
Benners C10+		2.22487E-08

Mass Fraction	%
Carbon Dioxide	1.10600
Hydrogen Sulfide	0.0160320
H2O	2.00676
Nitrogen	0.221708
Methane	11.7273
Ethane	18.4270
Propane	29.7326
Isobutane	4.05676
n-Butane	15.6371
2,2-Dimethylpropane	0
Isopentane	4.29264
n-Pentane	4.49485
2,2-Dimethylbutane	0
Cyclopentane	0.135195
2,3-Dimethylbutane	0
2-Methylpentane	0
3-Methylpentane	3.44832
n-Hexane	0.756531
Methylcyclopentane	0
Benzene	0.207976
Cyclohexane	0.0836636
2-Methylhexane	0
3-Methylhexane	0
2,2,4-Trimethylpentane	0.434772
Heptane	1.90710
Methylcyclohexane	0.0401556
Toluene	0.234542
Octane	0.660671
Ethylbenzene	0.0748926
o-Xylene	0.0232447
p-Xylene	0.0664303
Nonane	0.207312
Decane	0.000478710
Benners C10+	4.48893E-06
Mass Flow	**lb/h**
Carbon Dioxide	1.74535
Hydrogen Sulfide	0.0252998
H2O	3.16683
Nitrogen	0.349873
Methane	18.5066
Ethane	29.0793
Propane	46.9205
Isobutane	6.40190
n-Butane	24.6766
2,2-Dimethylpropane	0
Isopentane	6.77414
n-Pentane	7.09324
2,2-Dimethylbutane	0
Cyclopentane	0.213349
2,3-Dimethylbutane	0
2-Methylpentane	0
3-Methylpentane	5.44173
n-Hexane	1.19387
Methylcyclopentane	0
Benzene	0.328204
Cyclohexane	0.132028
2-Methylhexane	0
3-Methylhexane	0
2,2,4-Trimethylpentane	0.686106
Heptane	3.00956
Methylcyclohexane	0.0633689
Toluene	0.370127
Octane	1.04259
Ethylbenzene	0.118187
o-Xylene	0.0366821
p-Xylene	0.104833
Nonane	0.327155
Decane	0.000755443
Benners C10+	7.08390E-06

Process Streams		Tank OH
Properties	**Status:**	**Solved**
Phase: **Total**	**From Block:**	**MIX-103**
	To Block:	**--**
Property	**Units**	
Temperature	°F	72.2848
Pressure	psig	-1.43595
Mole Fraction Vapor	%	98.8226
Mole Fraction Light Liquid	%	1.17738
Mole Fraction Heavy Liquid	%	0
Molecular Weight	lb/lbmol	36.8626
Mass Density	lb/ft^3	0.0875682
Molar Flow	lbmol/h	4.28099
Mass Flow	lb/h	157.808
Vapor Volumetric Flow	ft^3/h	1802.12
Liquid Volumetric Flow	gpm	224.680
Std Vapor Volumetric Flow	MMSCFD	0.0389896
Std Liquid Volumetric Flow	sgpm	0.672006
Compressibility		0.977788
Specific Gravity		
API Gravity		
Enthalpy	Btu/h	-197662
Mass Enthalpy	Btu/lb	-1252.54
Mass Cp	Btu/(lb*°F)	0.417982
Ideal Gas CpCv Ratio		1.15020
Dynamic Viscosity	cP	
Kinematic Viscosity	cSt	
Thermal Conductivity	Btu/(h*ft*°F)	
Surface Tension	lbf/ft	
Net Ideal Gas Heating Value	Btu/ft^3	1882.67
Net Liquid Heating Value	Btu/lb	19229.2
Gross Ideal Gas Heating Value	Btu/ft^3	2052.72
Gross Liquid Heating Value	Btu/lb	20980.3

User Specification Summary

For Reported Objects

Client Name:	Vital	**Job:**	
Location:	Benedum Central Tank Battery		
Flowsheet:			

Flowsheet : Flowsheet1

PStream : Gas Inlet

Project!Flowsheets!Flowsheet1!PStreams!Gas Inlet!Phases!Total!Properties!Temperature		101	°F
Project!Flowsheets!Flowsheet1!PStreams!Gas Inlet!Phases!Total!Properties!Pressure		75	psig
Project!Flowsheets!Flowsheet1!PStreams!Gas Inlet!Phases!Total!Composition!Mole Fraction	Carbon Dioxide	0.316799683	%
	Hydrogen Sulfide	3.80E-03	%
	Nitrogen	3.185196815	%
	Methane	73.16682683	%
	Ethane	10.29398971	%
	Propane	7.197292803	%
	Isobutane	0.674699325	%
	n-Butane	2.536197464	%
	Isopentane	0.558499442	%
	n-Pentane	0.644899355	%
	Cyclopentane	7.74E-02	%
	3-Methylpentane	0.418299582	%
	n-Hexane	0.172899827	%
	Benzene	2.48E-02	%
	Cyclohexane	0.104499896	%
	2,2,4-Trimethylpentane	5.11E-02	%
	Heptane	0.222799777	%
	Methylcyclohexane	0.102399898	%
	Toluene	2.00E-02	%
	Octane	0.136899863	%
	Ethylbenzene	3.10E-03	%
	o-Xylene	1.80E-03	%
	p-Xylene	8.70E-03	%
	Nonane	5.34E-02	%
	Decane	2.37E-02	%

PStream : H-T Gas

Project!Flowsheets!Flowsheet1!PStreams!H-T Gas!Phases!Total!Properties!Temperature		120	°F
Project!Flowsheets!Flowsheet1!PStreams!H-T Gas!Phases!Total!Properties!Pressure		50	psig

PStream : HC Inlet

Project!Flowsheets!Flowsheet1!PStreams!HC Inlet!Phases!Total!Properties!Temperature		101	°F
Project!Flowsheets!Flowsheet1!PStreams!HC Inlet!Phases!Total!Properties!Pressure		75	psig
Project!Flowsheets!Flowsheet1!PStreams!HC Inlet!Phases!Total!Composition!Mole Fraction	Carbon Dioxide	3.34E-02	%
	Nitrogen	1.94E-02	%
	Methane	1.926396147	%
	Ethane	1.455297089	%
	Propane	3.959292081	%
	Isobutane	0.841498317	%
	n-Butane	4.344691311	%
	Isopentane	2.276295447	%
	n-Pentane	3.034593931	%
	3-Methylpentane	5.192189616	%
	n-Hexane	1.248797502	%
	Benzene	0.297499405	%
	2,2,4-Trimethylpentane	1.780996438	%
	Heptane	9.914680171	%
	Toluene	1.009597981	%
	Octane	9.607480785	%
	Ethylbenzene	0.921798156	%
	o-Xylene	0.360899278	%
	p-Xylene	0.82999834	%
	Nonane	8.755882488	%
	Benners C10+	42.18931562	%

PStream : Inlet Sep Gas

Project!Flowsheets!Flowsheet1!PStreams!Inlet Sep Gas!Phases!Total!Properties!Temperature		100	°F
Project!Flowsheets!Flowsheet1!PStreams!Inlet Sep Gas!Phases!Total!Properties!Pressure		75	psig

PStream : Sales Gas

Project!Flowsheets!Flowsheet1!PStreams!Sales Gas!Phases!Total!Properties!Pressure		150	psig

PStream : Water Inlet

Project!Flowsheets!Flowsheet1!PStreams!Water Inlet!Phases!Total!Properties!Temperature		101	°F
Project!Flowsheets!Flowsheet1!PStreams!Water Inlet!Phases!Total!Properties!Pressure		75	psig
Project!Flowsheets!Flowsheet1!PStreams!Water Inlet!Phases!Total!Composition!Mole Fraction	H2O	100	%

10201 E County Road 104
Midland, TX 79706
432-686-2719
www.nattygaslab.com

Gas Analysis Report

Method	GPA 2286	**Analyzed On**	5/1/2024
Analysis #	5870		
Cylinder #	23	**Analyzed By**	Jared Goldsmith

Customer Information

Attn: Mary Guinn
521 E 2nd St. STE 1000
Tulsa, OK 74120

Sample Information

Producer:	Vital Energy	**Sampled By:**	Jared Goldsmith
Well/Lease:	Benners Central	**Sample Date:**	4/30/2024
Station #:	Sales Gas	**Sample Pressure:**	35 psig
County:	Midland	**Sample Temperature:**	0 F
Sample Type:	Spot	**Sample Method:**	Purge
Remarks:	-	**Field H2S:**	38 ppm

Base Condition: 14.65 psia and 60° F

Physical Constants per GPA 2145-16

Component	Mole %	Wt %	GPM
H2S	0.0038	0.0056	
Nitrogen	3.1852	3.8585	
Carbon Dioxide	0.3168	0.6028	
Methane	73.1669	50.7576	
Ethane	10.2940	13.3850	2.749
Propane	7.1973	13.7239	1.980
Iso-Butane	0.6747	1.6957	0.221
N-Butane	2.5362	6.3745	0.798
Iso-Pentane	0.5585	1.7424	0.204
N-Pentane	0.6449	2.0119	0.233
2,3-Dimethylbutane & Cyclopentane	0.0774	0.2885	0.032
N-Hexane	0.1729	0.6444	0.071
Cyclohexane	0.1045	0.3803	0.036
Other Hexanes	0.4183	1.5430	0.161
Heptanes	0.2228	0.9581	0.098
Methylcyclohexane	0.1024	0.4346	0.041
2,2,4-Trimethylpentane	0.0511	0.2526	0.027
Benzene	0.0248	0.0839	0.007
Toluene	0.0199	0.0793	0.007
Ethylbenzene	0.0031	0.0141	0.001
M-Xylene	0.0056	0.0255	0.002
P-Xylene	0.0031	0.0144	0.001
O-Xylene	0.0018	0.0084	0.001
Other Octanes	0.1369	0.6680	0.066
Nonanes	0.0534	0.2943	0.029
Decanes +	0.0237	0.1526	0.015
Total	**100.0000**	**100.0000**	**6.779**

Sample Calculations

C10+ Calculations

Gross Heating Value (BTU/ft^3)

Dry	Wet	
1323.9	1300.7	Ideal
1329.5	1306.7	Real

Dry Compressibility Factor (Z)

0.9958

Dry Specific Gravity (air=1.000)

0.7985	Ideal
0.8015	Real

C10+ Dry Specific Gravity (air=1.000)

5.1464	Ideal
5.1661	Real

Molecular Weight

23.13

C10+ Molecular Weight

149.04

10201 E County Road 104
Midland, TX 79706
432-686-2719
www.nattygaslab.com

Oil Analysis Report

Method	GPA 2103	**Analyzed On**	5/7/2024
Analysis #	5864		
Cylinder #	124384	**Analyzed By**	Stefan Carrasco

Customer Information

Attn: Marry Guinn
521 E 2nd St. STE 1000
Tulsa, OK 74120

Sample Information

Producer:	Vital Energy	**Sampled By:**	Jared Goldsmith
Location:	Banners Central	**Sample Date:**	4/30/2024
Station #:	4028 MS Separator	**Sample Pressure:**	75 psig
County:	Midland	**Sample Temp:**	101 F
Sample Type:	Spot	**Sample Method:**	Constant Pressure
Remarks:	-		

Base Condition: 14.65 psia and 100° F — Physical Constants per GPA 2145-16

Component	Mol %	Wt %	L.V. %
Nitrogen	0.0194	0.0029	0.0030
Carbon Dioxide	0.0334	0.0079	0.0080
Methane	1.9264	0.1657	0.4590
Ethane	1.4553	0.2346	0.5470
Propane	3.9593	0.9361	1.5330
Iso-Butane	0.8415	0.2622	0.3870
N-Butane	4.3447	1.3539	1.9250
Iso-Pentane	2.2763	0.8805	1.1700
N-Pentane	3.0346	1.1739	1.5460
N-Hexane	1.2488	0.5770	0.7410
Other Hexanes	5.1922	2.3586	2.7445
Heptanes	9.9147	5.2609	6.1157
Octanes	9.6075	5.8264	6.8132
Nonanes	8.7559	6.0210	7.1048
Decanes +	42.1894	72.0217	65.7840
Benzene	0.2975	0.1246	0.1201
Toluene	1.0096	0.4987	0.4878
Ethylbenzene	0.9218	0.5247	0.5133
M & P-Xylene	0.8300	0.4724	0.4637
O-Xylene	0.3609	0.2054	0.1980
2,2,4-Trimethylpentane	1.7810	1.0907	1.3358
Total	**100.0000**	**100.0000**	**100.0000**

Sample Calculations

SG @ 60°F (H2O=1) =	**0.8517**
Molecular Weight =	**186.512**
Ft^3 vapor/gallon @ 14.696 =	**14.492**
API Gravity @ 60°F =	**34.6481**

Sample C10+ Calculations

SG @ 60°F (H2O=1) =	**0.9337**
Molecular Weight =	**318.3956**
Ft^3 vapor/gallon @ 14.696 =	**9.3068**
API Gravity @ 60°F =	**20.0534**

August 13, 2024

FESCO Ltd.
5000 W. Interstate 20 - Midland, Texas 79703

For: Vital Energy Inc.
521 E. 2nd Street, Suite 1000
Tulsa, Oklahoma 74120

LABORATORY TEST RESULTS

Area **Old Henry**
Location: **Various B**
Test : **H2S** Test Method: **GPA-2377**

Date	Well Name	Lease ID	Sales PPM	Oil PPM
11/20/2023	Benedum Central		2.50	
11/21/2023	Benners Central		8.00	2000.00
11/22/2023	Benners North		3.00	7.00
11/28/2023	Bentz 312 Facility		400.00	900.00
12/20/2023	Bloxom Central		115.00	250.00

FESCO Ltd. - Midland, Texas

Bryan McCollum 432-332-3211

CALCULATION METHODOLOGY

Oil and Gas Standard Permit Emission Units Description

Heater(s)

The one (1) 0.5-mmBtu/hr heater treater (HT-01) emissions are calculated using AP-42 emission factors.

Storage Tank(s)

Oil and produced water are collected and stored prior to being transferred offsite via pipeline in four (4) 500-bbl oil storage tanks (OST 01-04) and six (6) 500-bbl produced water storage tanks (WST 01-06). As a conservative estimate, produced water tanks are considered to contain 1% oil. Oil tank emissions are calculated based on a maximum anticipated oil throughput using AP-42 Chapter 7 data and equations with separator flash vapors calculated using the ProMax process simulation (output enclosed) and a recent liquid analysis. Flash vapors from all storage tanks are routed to the standard flare (FL-01).

Flare(s)

The one (1) standard flare (FL-01) is designed and operated in accordance with 40 CFR §60.18.

Fugitive Emissions

Fugitive emissions (FE-01) are estimated using a site-specific count and Oil and Gas Production factors from API.

Planned Maintenance, Start-ups, Shutdowns (MSS)

Planned maintenance, start-up and shutdown of facilities (MSS) emissions, which includes routine maintenance, start-up and shutdown of facilities, and temporary maintenance VOC emissions are estimated and are included in this registration.

Non-Rule Air Quality Standard Permit for Oil and Gas Handling and Production Compliance Demonstration

(a)(1) Reeves County is not located in a Barnett Shale county; therefore, registration under the non-ruled standard permit is voluntary.

(a)(2) Facility qualifies for Non-Rule Standard Permit No. 175144.

(b)(5) The project includes all facilities currently authorized plus facilities added to the facility under this registration.

(b)(6)(D) The project (boundaries of the registration) includes the Facility and emission sources as outlined in the attached plot plan.

(b)(8) Impacts analysis as specified in paragraph (k) of this standard permit has been completed and demonstrates compliance with applicable ambient air standards and effects screening levels.

(c)(2)(A) This project shall not exceed thresholds for a new 30 TAC §116.12 major source, or major modification under new source review requirements of the FCAA, Part C (Prevention of Significant Deterioration Review).

(c)(2)(B) This project will comply with all applicable requirements of 40 CFR §60, §61, and §63.

(c)(2)(C) This project will comply with all applicable requirements of 30 TAC Chapters 111-114.

(c)(3) Vital shall meet all applicable requirements in this standard permit, shall not misrepresent or fail to fully disclose all relevant facts in obtaining the permit; and shall not be indebted to the state for failure to make payments of penalties or taxes imposed by the statutes or rules within the commission's jurisdiction.

(c)(4)(A) All facilities (if applicable) are incorporated into this registration.

(c)(4)(B) All facilities shall meet all emission limits established by this standard permit and review in accordance with paragraph (b)(8).

(c)(4)(C) All facilities shall meet requirements of paragraphs (e), (i), and (j) for Best Management Practices and Minimum Requirements, Planned MSS, and associated Records, Sampling, and Monitoring of this standard permit.

(c)(4)(D) Facilities (if applicable) previously permitted under 30 TAC §116.620 that are changed in such a way as to increase the potential to emit, production processing capacity, or registered emissions must meet the requirements of (e) BACT. Otherwise, paragraph (e) (BACT) does not apply.

(d)(1) Only specific facilities and groups of facilities stated in this regulation are included in this project.

(e)(1-12) Vital will employ best management practices (BMP) for the existing facilities under the project and best available control technology (BACT), as applicable, for all new facilities added under this project. The following BMP and BACT requirements apply:

> (e)(1) All new equipment will be maintained in good working order and operated properly during facility operations.
>
> (e)(2) All new equipment shall be operated at least 50 ft from any property line or receptor.
>
> (e)(3)(D) Please refer to the attached Regulatory Applicability for all applicable requirements of 40 CFR §60 and 40 CFR §63.

(e)(6)(A) Fugitive component seals and gaskets shall be installed, checked, and properly maintained to prevent leaking. All components shall be physically inspected quarterly for leaks.

(e)(6)(B) Vital will comply with the leak detection and repair (LDAR) program as specified in Table 9 in paragraph (m).

(e)(6)(C) All components found leaking shall be repaired. All leaks not repaired immediately shall be tagged or noted in a log and repaired within 60 days after the leak is found. If shutdown required, the repair may be delayed until the next shutdown.

(e)(6)(D) Tank hatches, not designed to be completely sealed, shall remain closed (but not completely sealed in order to maintain safe design functionality) except for sampling, gauging, loading, unloading, or planned maintenance activities.

(e)(6)(E) New and reworked valves and piping connections shall be reasonably located such that they can be accessible for leak checking.

(f)(1) For all previous claims of this standard permit (or any previous version of this standard permit) existing authorized facilities are not required to meet the requirements of this standard permit until a renewal under the standard permit is submitted after December 31, 2015.

(f)(4)(A) and (B) Notification was submitted through e-Permits using the “APD OGS New Project Notification” and the $50 fee made through the e-Pay system.

(f)(5) This registration meets (f)(5) requirements and includes the $850 fee.

(g) This registration complies with 30 TAC §116.610 (except emission limitations of §116.610 (a)(1)), §116.611, §116.614 and §116.615 (except notification requirements).

(h)(1) Total maximum estimated annual emissions of any air contaminant does not exceed PSD major source or major modification applicable limits.

(h)(2) Emissions meet the limitations established in paragraph (k).

(h)(3) Maximum emissions (facilities previously registered under 30 TAC §116.620 and facilities added under this non-rule air quality standard permit) after any operator limitations or controls are less than those stated in the (h)(3) table.

(i)(1), (2), and (3) MSS emissions are included in this non-rule air quality standard permit registration and include planned MSS activities and emissions as outlined in (2) and (3).

(i)(4) Engine/compressor start-up emissions are included (if necessary) in MSS emissions as outlined above.

(j)(1) Sampling and demonstration of compliance include those requirements as outlined in Table 7, and include the following:

- Site specific analysis shall be performed within 90 days of initial start of operation.
- Those to include H2S and VOC GC analysis for gas streams
- Initial stack testing for any engine > 500 hp
- Periodic and biennial stack testing as required

(j)(2) Monitoring and records for demonstration of compliance include those requirements as outlined in Table 8, and include the following:

- Daily oil and produced water throughput
- Current and updated plot plan
- Copy of the registration and emission calculations and the plan and records for
- routine inspection, cleaning, repair and replacement
- Record of fugitive component count shall be maintained. A record of the date that
- each quarterly inspection was made, the date of any component found leaking, and
- the date of any planned shutdown shall be maintained.
- Records of minor changes and like-kind replacements
- Records of operational hours for all combustion devices and internal combustion
- engines.

(k) Impacts evaluations (as required and outlined in (k)) were performed for facilities previously registered under 30 TAC §116.620 and facilities added under this non-rule air quality standard permit. Compliance with state or federal ambient air standards for NO2, SO2, Benzene, and H2S is shown at the property line (See Impacts Summary). Compliance with hourly and annual ESLs for benzene is shown at the nearest receptor (See Impacts Summary). For any distance to receptor or property between increments on emissions impact Tables 2-5F, the shortest distance was used to get the Hourly (ug/m3)/(lb/hr).

(l) All facilities previously qualified under 30 TAC §116.620 are now subject to the non-rule air quality standard permit, except for exceptions of paragraph (e) (BACT) mentioned in (c)(4)(D).

(m) Non-rule air quality standard permit Tables 1-10 were used as required by this standard permit registration.

FEDERAL REGULATORY APPLICABILITY

New Source Performance Standards Applicability

New Source Performance Standards (NSPS) contained in 40 CFR Part 60 regulate specific new, modified, or reconstructed sources of emissions. The following is an analysis of NSPS potentially applicable to the facility.

Subpart Dc, Small Industrial-Commercial-Institutional Steam Generating Units. This subpart affects industrial-commercial-institutional steam-generating units with a design capacity between 10 and 100 mmBtu/hr heat input and which commenced construction or modification after July 9, 1989. HTR-1 capacity is less than 10 mmbtu/hr and is therefore not subject to the requirements of this subpart.

Subpart OOOOa, Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution. The emission sources affected by this subpart include well completions, pneumatic controllers, equipment leaks from natural gas processing plants, sweetening units at natural gas processing plants, reciprocating compressors, centrifugal compressors and storage vessels which are constructed, modified or reconstructed after September 18, 2015 and before December 6, 2022.

Pneumatic controllers affected by the NSPS OOOOa include continuous bleed, natural gas driven pneumatic controllers with a natural gas bleed rate greater than 6 SCFH that commenced construction, modification or reconstruction after September 18, 2015 and before December 6, 2022. There are no continuous bleed natural gas-driven pneumatic controller affected facilities at this site. Therefore, the subpart does not apply (40 CFR §60.5365a(d)).

Standards also apply to storage vessels constructed, modified or reconstructed after September 18, 2015 and before December 6, 2022, with VOC emissions equal to or greater than 6 tons per year (TPY). The storage tanks have a controlled potential to emit less than 6 TPY of VOC emissions and were constructed after September 18, 2015 and before December 6, 2022; therefore, they are not subject to this subpart. The Fugitives at the facility are subject to this subpart. Vital will comply with all applicable requirements.

Subpart OOOOb, Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After December 6, 2022. If there is a standard or other requirement, then the facility is an “affected facility.” Currently there are standards for: tanks, fugitives, and pneumatic pumps.

Facility has not been modified for the purposes of this subpart since December 6, 2022; therefore, this subpart does not apply.

National Emissions Standards for Hazardous Air Pollutants Applicability

The project is not subject to current National Emission Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR Part 61.