February 24, 2025

VIA STEERS

To: Texas Commission on Environmental Quality
Air Permits Initial Review Team, MC 161
Building C, Third Floor
12100 Park 35 Circle
Austin, Texas 78753

Re: Continental Resources, Inc.
CN603075706
RN111314480
Permit by Rule Update
Whiskey River N Section 59H CTB

Continental Resources, Inc. (the Operator) owns and operates the Whiskey River N Section 59H CTB (Facility) formerly called Whiskey River N Sec 59 Tank Battery in Ward County, Texas, under Texas Commission on Environmental Quality (TCEQ) Permit by Rule (PBR), Registration No. 165340. The Operator is requesting to register produced gas flaring volumes at the high-pressure flare (FL2) as well as increase general maintenance, startup, and shutdown emissions. The Operator has prepared a PI-7-CERT submittal to register and certify the updated site-wide emissions and production. A CORE Data form to update the site name has been submitted in STEERS.

The fee of $450 has been paid via the online system. If you have any questions concerning the submittal or wish to discuss the information provided with this submission, please contact Mr. Adam DeLaney, Environmental Engineer, at (405) 234-9415.

Sincerely,
Altamira-US, LLC

Zachary Crowell
Program Manager

CONTINENTAL RESOURCES, INC.
WHISKEY RIVER N SECTION 59H CTB
WARD COUNTY, TEXAS

PROCESS DESCRIPTION

Continental Resources, Inc. (Continental) owns and operates Whiskey River N Section 59H CTB (Facility), an oil and natural gas gathering facility located in Ward County, Texas. Oil production is expected to be 679 barrels per day (BPD) and water production is expected to be 982 BPD. Continental will maintain sufficient records to demonstrate that actual emissions do not exceed the annual limits certified in this PBR.

The Facility receives gas and liquids from two formations. The gas and liquids from the formations are sent to the free-water knock outs (FWKOs). Gas from the FWKOs is sent to the sales line. To allow for periods of sales pipeline downtime, an alternative operating scenario is included where some sales gas can be routed to the high-pressure flare (FL2). Produced water from the FWKOs is sent to the produced water tanks (TANK3 – TANK4). Oil from the heater treaters is sent to a vapor recovery tower (VRT) where flashing occurs prior to entering the oil tanks (TANK1 – TANK2). Vapors from the storage tanks are sent to the vapor recovery units (VRUs). Gas from VRT and heater treaters are routed to the VRUs and then to sales. During VRU downtime, emissions are routed to the low-pressure flare (FL1). To allow for operational flexibility, it is conservatively estimated the VRUs have a 5% downtime.

Oil and produced water from the storage tanks is removed from the site primarily via pipeline; however, Continental has provided loading emissions calculations conservatively estimating that 5% of the facility's oil and produced water throughput will be trucked off-site (LOAD1, LOAD2). The trucks are in dedicated normal service.

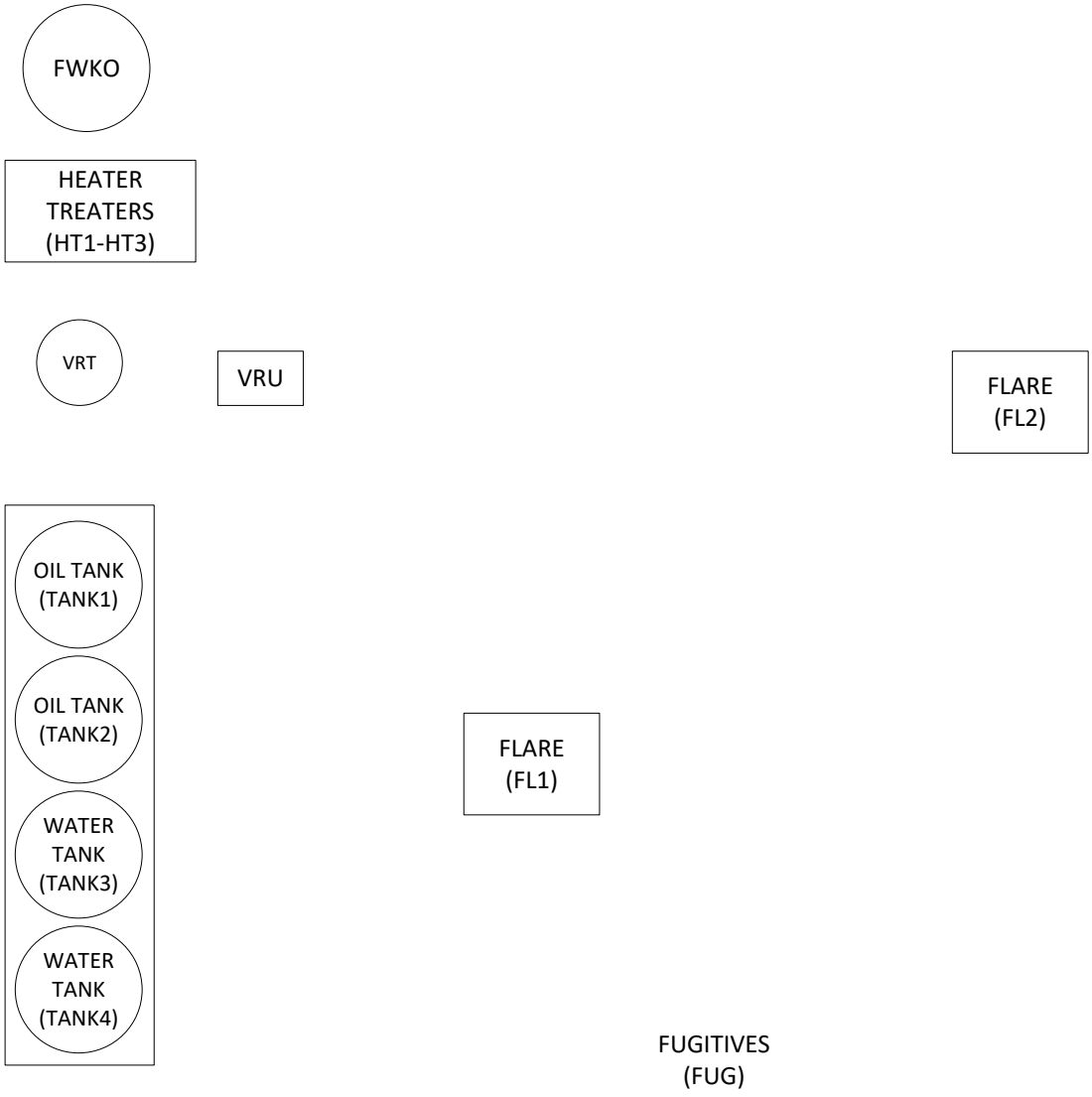
Working and breathing losses from the tanks were estimated using AP-42, June 2020, Section 7.1.3.1, utilizing ProMax. Flash emissions from the storage tanks and heater treaters were estimated using ProMax.

The gas analysis used in the fugitive calculations and the liquid analysis used in the ProMax is from representative Facilities. The representative sites meet the TCEQ requirements and pulls from the same formations as the Facility. In addition, both sites process the gas/liquids in a similar manner and have API gravities within 3 degrees of each other.

The Facility was constructed after September 18, 2015; therefore, the site is not subject to 40 CFR Part 60 New Source Performance Standards (NSPS) Subpart OOOO, but is subject to the LDAR requirements under NSPS Subpart OOOOa. The storage tanks are not subject to NSPS Subpart Kb as they are located prior to custody transfer and they are not subject to NSPS Subpart OOOO or OOOOa as the facility has certified emissions less than 6 tons per year of VOC. Nothing in the Project is a modification under NSPS Subpart OOOOb.

Emissions from MSS activities are included in this application.

All emission sources at the Facility are authorized under Texas Commission on Environmental Quality (TCEQ) permit by rule (PBR) 106.352, 106.359, and 106.492.



ALTAMIRA

525 Central Park Drive
Suite 500
Oklahoma City, OK 73105

www.altamira-us.com

FIGURE TITLE
PLOT DIAGRAM

DOCUMENT TITLE
UPDATE TO PBR REGISTRATION NO. 165340

CLIENT
CONTINENTAL RESOURCES, INC.

LOCATION
WHISKEY RIVER N SECTION 59H CTB
WARD COUNTY, TX

DATE	2/21/2025
SCALE	NOT TO SCALE
DESIGNED BY	SE
APPROVED BY	ZC
DRAWN BY	SE
PROJECT NUMBER	CONAOK2501
FIGURE NUMBER	3-2

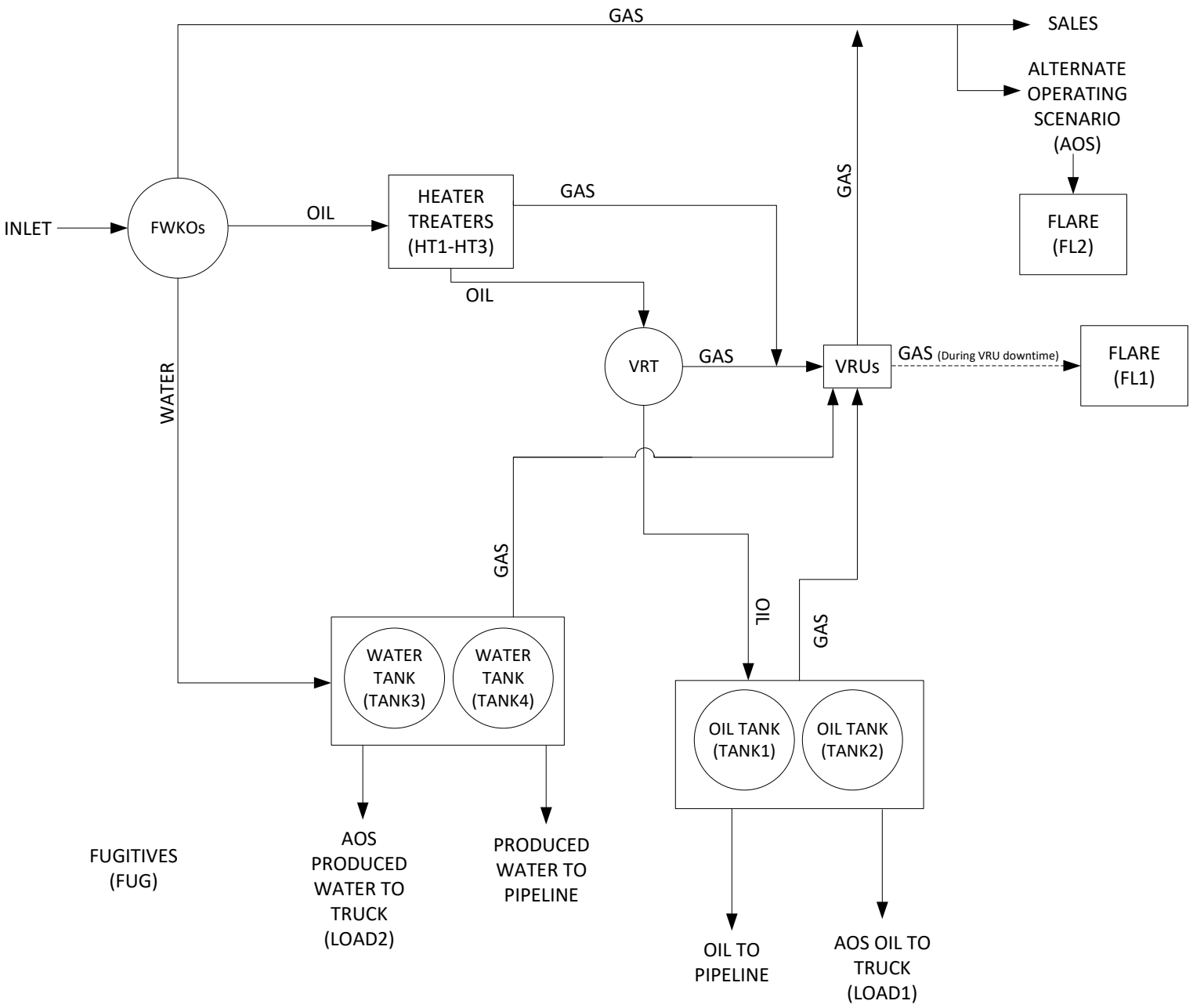


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FIGURE TITLE	PROCESS FLOW DIAGRAM
DOCUMENT TITLE	UPDATE TO PBR REGISTRATION NO. 165340
CLIENT	CONTINENTAL RESOURCES, INC.
LOCATION	WHISKEY RIVER N SECTION 59H CTB WARD COUNTY, TX

DATE	2/21/2025
SCALE	NOT TO SCALE
DESIGNED BY	SE
APPROVED BY	ZC
DRAWN BY	AT
PROJECT NUMBER	CONAOK2501
FIGURE NUMBER	3-3

Certification and Registration for Permits by Rule
Form PI-7-CERT
Page 1
Texas Commission on Environmental Quality

I. Registrant Information
A. Company or Other Legal Customer Name Continental Resources, Inc.
Company Official Contact Information (☐ Mr. ☒ Mrs. ☐ Ms. ☐ Other: _____)
Name: Grace Prince
Title: Production Manager, Permian Basin
Mailing Address: PO Box 269000
City: Oklahoma City
State: OK
ZIP Code: 73126
Phone: (405) 234-9231
Fax:
Email Address: Grace.Prince@clr.com
All PBR registration responses will be sent via email.
A. Technical Contact Information (☒ Mr. ☐ Mrs. ☐ Ms. ☐ Other: _____)
Name: Adam DeLaney
Title: Environmental Engineer
Company Name: Continental Resources, Inc.
Mailing Address: PO Box 269000
City: Oklahoma City
State: OK
ZIP Code: 73126
Phone Number: (405) 234-9415
Fax Number:
Email Address: Adam.DeLaney@clr.com

Certification and Registration for Permits by Rule
Form PI-7-CERT
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II. Facility and Site Information
A. Name and Type of Facility
Facility Name: Whiskey River N Section 59H CTB
Facility Type: ☒ Permanent ☐ Temporary
For portable units, please provide the serial number of the equipment being authorized below.
Serial No(s):
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).
FROM PYOTE HEAD S ON RANCH RD 1927 FOR 7.6 MI L ONTO DIRT RD FOR 0.3 MI R ON DIRT RD FOR 0.6
MI TO SITE ON THE L
City: Pyote
County: Ward
ZIP Code: 79777
C. TCEQ Core Data Form
Is the Core Data Form (TCEQ Form Number 10400) attached? ☐ YES ☒ NO
If "NO," provide customer reference number (CN) and regulated entity number (RN) below.
Customer Reference Number (CN): 603075706
Regulated Entity Number (RN): 111314480
D. TCEQ Account Identification Number (if known):
E. Type of Action
☐ Initial Application ☒ Change to Registration
For Change to Registration provide the Registration Number: 165340
F. PBR number(s) claimed under 30 TAC Chapter 106
(List all the individual rule number(s) that are being claimed.)
106. 352 Oil and Gas Production Facilities
106. 359 Planned MSS at Oil and Gas Facilities
106. 492 Smokeless Gas Flares
106.

Certification and Registration for Permits by Rule
Form PI-7-CERT
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Texas Commission on Environmental Quality

II. Facility and Site Information *(continued)*	
G. Historical Standard Exemption or PBR	
Are you claiming a historical standard exemption or PBR?	☐ YES ☒ NO
If "YES," enter rule number(s) and associated effective date in the spaces provided below.	
Rule Number:	Effective Date:
Rule Number:	Effective Date:
H. 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 dates in the spaces provided below.	
Standard Exemption or PBR Registration Number:	
Effective Date:	
I. 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:	
Standard Exemption, PBR Registration, and Standard Permit Registration Number(s):	
Effective Date:	
Standard Exemption, PBR Registration, and Standard Permit Registration Number(s):	
Effective Date:	
J. 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.	
K. Affected Air Preconstruction Permits	
Does the PBR being claimed directly affect any permitted facility?	☐ YES ☒ NO

Certification and Registration for Permits by Rule
Form PI-7-CERT
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Texas Commission on Environmental Quality

II. Facility and Site Information *(continued)*	
If "YES," enter the permit number(s) in the spaces provided below.	
L. Federal Operating Permit (FOP) Requirements (30 TAC Chapter 122 Applicability)	
1. 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 certification is accepted. *(check all that apply)*	
☐ Initial Application for a 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	
2. 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 VII. for address to send fee or go to www.tceq.texas.gov/epay to pay online.)*	
A. Fee Requirements	
Is a fee required per Title 30 TAC § 106.50?	☒ YES ☐ NO
If "NO," specify the exception. There are three exceptions to paying a PBR fee. (*check all that apply*)	
1. Registration is solely to establish a federally enforceable emission limit.	☐
2. Registration is within six months of an initial PBR review, and it is addressing deficiencies, administrative changes, or other allowed changes.	☐
3. Registration is for a remediation project (30 TAC § 106.533).	☐
B. Fee Amount	
1. A $100 fee is required if *any* of the answers in III.B.1 are "YES."	
This business has less than 100 employees.	☐ YES ☒ NO
This business has less than $6 million dollars in annual gross receipts.	☐ YES ☒ NO
This registration is submitted by a governmental entity with a population of less than 10,000.	☐ YES ☒ NO
This registration is submitted by a non-profit organization.	☐ YES ☒ NO

Certification and Registration for Permits by Rule
Form PI-7-CERT
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Texas Commission on Environmental Quality

III.	**Fee Information (***See Section VII. for address to send fee or go to www.tceq.texas.gov/epay to pay online.) (continued)*
2.	A $450 fee is required for all other registrations
A.	Payment Information
Check/money order/transaction or voucher number:	
Individual or company name on check:	
Fee Amount: $ 450	
Was the fee paid online?	☒ YES ☐ NO
IV.	**Technical Information Including State aAnd Federal Regulatory Requirements** **Check the appropriate box to indicate what is included in your submittal.** **NOTE:** *Any technical or essential information needed to confirm that facilities are meeting the requirements of the PBR must be provided. Not providing key information could result in a deficiency of the project.*
A.	PBR 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 § 106.4 are met?	☒ YES ☐ NO
Did you demonstrate that the individual requirements of the specific PBR are met?	☒ YES ☐ NO
B	Confidential Information Included (If confidential information is submitted with this registration, all confidential pages must be properly marked “CONFIDENTIAL.”) ☐ YES ☒ NO
C.	Process Flow Diagram: ☒ YES ☐ NO
D.	Process Description: ☒ YES ☐ NO
E.	Maximum Emissions Data and Calculations: ☒ YES ☐ NO
Note: *If the facilities listed in this registration are subject to the Mass Emissions Cap & Trade program under* ***30 TAC Chapter 101, Subchapter H, Division 3,*** *the owner/operator of these facilities must possess NO_x allowances equivalent to the actual NO_x, emissions from these facilities.*	
F.	Is this certification being submitted to certify the emissions for the entire site? ☒ YES ☐ NO
If “NO,” include a summary of the specific facilities and emissions being certified.	
G.	Table 1(a) (Form 10153) Emission Point Summary: ☒ YES ☐ NO
H.	Distances from Property Line and Nearest Off-Property Structure
Distance from this facility’s emission release point to the nearest property line: >50	feet
Distance from this facility’s emission release point to the nearest off-property structure: >1,320	feet

Certification and Registration for Permits by Rule
Form PI-7-CERT
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IV. Technical Information Including State and Federal Regulatory Requirements **Check the appropriate box to indicate what is included in your submittal.** **NOTE:** *Any technical or essential information needed to confirm that facilities are meeting the requirements of the PBR must be provided. Not providing key information could result in a deficiency of the project.*
I. Project Status
Has the company implemented the project or waiting on a response from TCEQ? ☒ Implemented ☐ Waiting
J. Projected Start of Construction and Projected Start of Operation Dates:
Projected Start of Construction (provide date):
Projected Start of Operation (provide date):
V. Delinquent Fees
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 is 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.
VI. Signature For Registration and Certification
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 this 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.
Grace Prince
Name (printed)
Signed by: Grace Prince 3BC1A2EB7328436...
Signature (original signature required)
3/10/2025
Date

DS DS

VII. Submitting Copies of the Certification and Registration

Copies must be sent as listed below.
Processing delays may occur if copies are not sent as noted.

Who	Where	What
Air Permits Initial Review Team (APIRT)	Regular, Certified, Priority Mail MC 161, P.O. Box 13087 Austin, Texas 78711-3087 Hand Delivery, Overnight Mail MC 161, 12100 Park 35 Circle, Building C, Third Floor Austin, Texas 78753	Originals Form PI-7-CERT, Core Data Form, and all attachments. Not required if using ePermits[1].
Revenue Section, TCEQ	Regular, Certified, Priority Mail MC 214, P.O. Box 13088 Austin, Texas 78711-3088 Hand Delivery, Overnight Mail MC 214, 12100 Park 35 Circle, Building A, Third Floor Austin, Texas 78753	Original Money Order or Check, Copy of Form PI-7-CERT, and Core Data Form. Not required if fee was paid using ePay[2].
Appropriate TCEQ Regional Office	To find your Regional Office address, go to the TCEQ website at www.tceq.texas.gov/agency/directory/region, or call (512) 239-1250.	Copy of Form PI-7-CERT, Core Data Form, and all attachments. Not required if using ePermits
Appropriate Local Air Pollution Control Program(s)	To Find your local or Regional Air Pollution Control Programs go to the TCEQ, APD website at www.tceq.texas.gov/permitting/air/local_programs.html, or call (512)-239-1250	Copy of Form PI-7-CERT, Core Data Form, and all attachments.

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

Texas Commission on Environmental Quality
Oil and Gas Handling and Production Facilities
Air Permits by Rule (PBR) Checklist
Title 30 Texas Administrative Code § 106.352(l)

Check the most appropriate answer and include any technical information in the spaces provided. If additional space is needed, please include an extra page that references this checklist. The forms, checklists, and guidance documents are available from the Texas Commission on Environmental Quality (TCEQ), Air Permits Division Web site at: www.tceq.texas.gov/permitting/air/permitbyrule/subchapter-o/oil_and_gas.html. If you have any questions, or need additional assistance, please contact the Air Permits Division at (512) 239-1250.

The facility can register by submitting this application and any supporting documentation. Below is a checklist to ensure you have provided all appropriate documentation. For sites that require registration or if the company chooses to register the site with the TCEQ, a Core Data Form is required with this checklist.
For additional assistance with your application, including resources to help calculate your emissions, please visit the Small Business and Local Government Assistance (SBLGA) webpage at the following link: www.TexasEnviroHelp.org.

This checklist is for use by the operator to ensure a complete application.		
Have you included each of the following items in the application?		
☒	Process Description.	
☒	Plot plan or area map.	
☒	TCEQ Oil and Gas Emission Calculation Spreadsheet (or equivalent).	
☒	Detailed summary of maximum emissions estimates with supporting documentation, such as result reports from any emission estimation computer program.	
☒	Gas and Liquid analyses. If a site specific analysis is not submitted, please provide justification as to why a representative site was used.	
☒	Technical documents (manufacturer's specification sheet, operational design sheets)	
☒	State and Federal applicability.	
☐	Core Data Form (for new sites that have never been registered with the TCEQ).	
1	Is the project located in one of the Barnett Shale counties and did the start of construction or modification begin on or after April 1, 2011?	☐ Yes ☒ No
Note: *Counties included in the Barnett Shale area: Cooke, , Dallas, Denton, , Ellis, Erath, Hill, Hood, Jack, Johnson, Montague, Palo Pinto, Parker, Somervell, Tarrant, and Wise counties.*		
For what is considered start of construction see: www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/factsheet-const.pdf		
*If **"Yes,"** do not complete this checklist. The project is subject to the requirements of §106.352(a)-(k). Additional information for Barnett Shale area projects can be found at:* www.tceq.texas.gov/permitting/air/permitbyrule/subchapter-o/oil_and_gas.html.		

Texas Commission on Environmental Quality
Oil and Gas Handling and Production Facilities
Air Permits by Rule (PBR) Checklist
Title 30 Texas Administrative Code § 106.352(l)

General Information and Questions/Descriptions *(continued)*		
2	Are the total site-wide emissions from all facilities claimed under 30 TAC §106.352(l) less than 25 tpy VOC, 250 tpy NOx, 250 tpy CO, and 25 tpy SO_2?	☒ Yes ☐ No
3.	Are there flares, engines, or turbines at the site?	☒ Yes ☐ No
*If **"Yes,"** attach supporting documentation to demonstrate compliance with the requirements.*		
Additional information and checklists can be found at: *§106.492 Flares:* www.tceq.texas.gov/permitting/air/permitbyrule/subchapter-v/flares.html *§106.512 Stationary Engines and turbines:* www.tceq.texas.gov/permitting/air/permitbyrule/subchapter-w/stationary_eng_turb.html		
4.	Does any facility at the site handle a stream with more than 24 ppm hydrogen sulfide (H_2S)?	☒ Yes ☐ No
*If **"Yes,"** proceed to question (4)(a) and (4)(b) and then proceed to questions 5 and 6 .*		
*If **"No,"** continue to questions 5 and 6.*		
4a.	What is the actual H_2S content of the stream?	.1000 ppm
Site specific H_2S analysis is required.		
4b.	Indicate the actual distance from the nearest emissions point to the nearest offsite receptor:	>1,320 ft.
Note: *An offsite receptor includes any recreational area, residence, or other structure not occupied or used solely by the owner or operator of the facility. A facility handling sour gas must be located at least 1/4 mile from the nearest offsite receptor.*		
5.	Indicate the total actual emission rate of sulfur compounds, excluding sulfur oxides, from all vents	See Table 1 lb/hr.
6.	Does the height of all vents at the site emitting sulfur compounds meet the minimum required height based on the H_2S emission rate in 106.352(l)(4)?	☒ Yes ☐ No
Note: *Truck loading and fugitive sources are not considered vents.*		

Recordkeeping: To demonstrate compliance with the requirements of the PBR, sufficient records must be maintained at all times. The records must be made available immediately upon request to the commission or any air pollution control program having jurisdiction. If you have any questions about the recordkeeping requirements, contact the Air Permits Division or the Air Program in the TCEQ Regional Office for the region in which the site is located.

Save Form Reset Form

Texas Commission on Environmental Quality
Permit by Rule Applicability Checklist
Title 30 Texas Administrative Code § 106.4

The following checklist was developed by the Texas Commission on Environmental Quality (TCEQ), **Air Permits Division**, to assist applicants in determining whether or not a facility meets all of the applicable requirements. Before claiming a specific Permit by Rule (PBR), a facility must first meet all of the requirements of **Title 30 Texas Administrative Code § 106.4** (30 TAC § 106.4), "Requirements for Permitting by Rule." Only then can the applicant proceed with addressing requirements of the specific Permit by Rule being claimed.

The use of this checklist is not mandatory; however, it is the responsibility of each applicant to show how a facility being claimed under a PBR meets the general requirements of 30 TAC § 106.4 and also the specific requirements of the PBR being claimed. If all PBR requirements cannot be met, a facility will not be allowed to operate under the PBR and an application for a construction permit may be required under 30 TAC § 116.110(a).

Registration of a facility under a PBR can be performed by completing **Form PI-7** (Registration for Permits by Rule) or **Form PI-7-CERT** (Certification and Registration for Permits by Rule). The appropriate checklist should accompany the registration form. Check the most appropriate answer and include any additional information in the spaces provided. If additional space is needed, please include an extra page and reference the question number. The PBR forms, tables, checklists, and guidance documents are available from the TCEQ, Air Permits Division website at: www.tceq.texas.gov/permitting/air/nav/air_pbr.html.

1. 30 TAC § 106.4(a)(1) and (4): Emission Limits	**Answer**
List emissions in tpy for **each** facility (add additional pages or table if needed):	
Are the SO_2, PM_{10}, VOC, or other air contaminant emissions claimed for **each** facility in this PBR submittal less than 25 tpy?	☒ YES ☐ NO
Are the NO_x and CO emissions claimed for each facility in this PBR submittal less than 250 tpy?	☒ YES ☐ NO
*If the answer to both is "Yes," continue to the question below. If the answer to either question is "No," a **PBR cannot be claimed**.*	
Has any facility at the property had public notice and opportunity for comment under 30 TAC Section 116 for a regular permit or permit renewal? (This does not include public notice for voluntary emission reduction permits, grandfathered existing facility permits, or federal operating permits.)	☐ YES ☒ NO
If "Yes," skip to Section 2. If "No," continue to the questions below.	
If the site has had no public notice, please answer the following:	
Are the SO_2, PM_{10}, VOC, or other emissions claimed for **all** facilities in this PBR submittal less than 25 tpy?	☒ YES ☐ NO
Are the NO_x and CO emissions claimed for all facilities in this PBR submittal less than 250 tpy?	☒ YES ☐ NO
If the answer to both questions is "Yes," continue to Section 2.	
*If the answer to either question is "No," **a PBR cannot be claimed**. A permit will be required under Chapter 116.*	

Texas Commission on Environmental Quality
Permit by Rule Applicability Checklist
Title 30 Texas Administrative Code § 106.4

2. 30 TAC § 106.4(a)(2): Nonattainment Check	Answer
Are the facilities to be claimed under this PBR located in a designated ozone nonattainment county?	☐ YES ☒ NO
If "Yes," please indicate which county by checking the appropriate box to the right.	
(Moderate) - Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller counties:	☐ HGB
(Moderate) - Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise counties:	☐ DFW
If "Yes," to any of the above, continue to the next question. If "No," continue to Section 3.	
Does this project trigger a nonattainment review?	☐ YES ☐ NO
Is the project's potential to emit (PTE) for emissions of VOC or NO_x increasing by 100 tpy or more?	☐ YES ☐ NO
PTE is the maximum capacity of a stationary source to emit any air pollutant under its worst-case physical and operational design unless limited by a permit, rules, or made federally enforceable by a certification.	
Is the site an existing major nonattainment site and are the emissions of VOC or NO_x increasing by 40 tpy or more?	☐ YES ☐ NO
If needed, attach contemporaneous netting calculations per nonattainment guidance.	
Additional information can be found at: www.tceq.texas.gov/permitting/air/forms/newsourcereview/tables/nsr_table8.html and www.tceq.texas.gov/permitting/air/nav/air_docs_newsource.html	
*If "Yes," to any of the above, the project is a major source or a major modification and **a PBR may not be used**. A Nonattainment Permit review must be completed to authorize this project. If "No," continue to Section 3.*	
3. 30 TAC § 106.4(a)(3): Prevention of Significant Deterioration (PSD) check	
Does this project trigger a review under PSD rules?	
To determine the answer, review the information below:	
Are emissions of any regulated criteria pollutant increasing by 100 tpy of any criteria pollutant at a named source?	☐ YES ☒ NO
Are emissions of any criteria pollutant increasing by 250 tpy of any criteria pollutant at an unnamed source?	☐ YES ☒ NO
Are emissions increasing above significance levels at an existing major site?	☐ YES ☒ NO
PSD information can be found at: www.tceq.texas.gov/assets/public/permitting/air/Forms/NewSourceReview/Tables/10173tbl.pdf and www.tceq.texas.gov/permitting/air/nav/air_docs_newsource.html	
*If "Yes," to any of the above, **a PBR may not be used**. A PSD Permit review must be completed to authorize the project.*	
If "No," continue to Section 4.	

Texas Commission on Environmental Quality
Permit by Rule Applicability Checklist
Title 30 Texas Administrative Code § 106.4

4. 30 TAC § 106.4(a)(6): Federal Requirements	Answer
Will all facilities under this PBR meet applicable requirements of Title 40 Code of Federal Regulations (40 CFR) Part 60, New Source Performance Standards (NSPS)?	☒ YES ☐ NO ☐ NA
If "Yes," which Subparts are applicable? *(answer below.)*	
Subpart OOOOa	
Will all facilities under this PBR meet applicable requirements of 40 CFR Part 63, Hazardous Air Pollutants Maximum Achievable Control Technology (MACT) standards?	☐ YES ☐ NO ☒ NA
If "Yes," which Subparts are applicable? *(answer below.)*	
Will all facilities under this PBR meet applicable requirements of 40 CFR Part 61, National Emissions Standards for Hazardous Air Pollutants (NESHAPs)?	☐ YES ☐ NO ☒ NA
If "Yes," which Subparts are applicable? *(answer below.)*	
If "Yes" to any of the above, please attach a discussion of how the facilities will meet any applicable standards.	
5. 30 TAC § 106.4(a)(7): PBR prohibition check	
Are there any air permits at the site containing conditions which prohibit or restrict the use of PBRs?	☐ YES ☒ NO
If "Yes," PBRs may not be used or their use must meet the restrictions of the permit. A new permit or permit amendment may be required.	
List permit number(s):	
6. 30 TAC § 106.4(a)(8): NO_x Cap and Trade	
Is the facility located in Harris, Brazoria, Chambers, Fort Bend, Galveston, Liberty, Montgomery, or Waller County?	☐ YES ☒ NO
If "Yes," answer the question below.	
If "No," continue to Section 7.	
Will the proposed facility or group of facilities obtain required allowances for NO_x if they are subject to 30 TAC Chapter 101, Subchapter H, Division 3 (relating to the Mass Emissions Cap and Trade Program)?	☐ YES ☐ NO

Texas Commission on Environmental Quality
Permit by Rule Applicability Checklist
Title 30 Texas Administrative Code § 106.4

7. Highly Reactive Volatile Organic Compounds (HRVOC) check		
Is the facility located in Harris County?		☐ YES ☒ NO
If "Yes," answer the next question. If "No," skip to the box below.		
Will the project be constructed after June 1, 2006?		☐ YES ☐ NO
If "Yes," answer the next question.		
If "No," skip to the box below.		
Will one or more of the following HRVOC be emitted as a part of this project?		☐ YES ☐ NO
If "Yes," complete the information below:		
Information	**lb/hr**	**tpy**
► 1,3-butadiene		
► all isomers of butene (e.g., isobutene [2-methylpropene or isobutylene])		
► alpha-butylene (ethylethylene)		
► beta-butylene (dimethylethylene, including both cis- and trans-isomers)		
► ethylene		
► propylene		
Is the facility located in Brazoria, Chambers, Fort Bend, Galveston, Liberty, Montgomery, or Waller County?		☐ YES ☒ NO
If "Yes," answer the next question. If "No," the checklist is complete.		
Will the project be constructed after June 1, 2006?		☐ YES ☐ NO
If "Yes," answer the next question. If "No," the checklist is complete.		
Will one or more of the following HRVOC be emitted as a part of this project?		☐ YES ☐ NO
If "Yes," complete the information below:		
Information	**lb//hr**	**tpy**
► ethylene		
► propylene		

Exemption § 106.492 Checklist
(Previously Standard Exemption 80)
Smokeless Gas Flares

You must submit a PI-7 with required attachments before construction or operation if the gas burned in the flare has a sulfur or chlorine concentration greater than 24 ppmv.

The following checklist is designed to help you confirm that you meet Exemption § 106.492, previously standard exemption 80, requirements. **Any "NO" answers indicate that the claim of exemption may not meet all requirements for the use of Exemption § 106.492, previously standard exemption 80.** If you do not meet all the requirements, you may alter the project design/operation in such a way that all the requirements of the exemption are met, or obtain a construction permit.

Question/Description	Response
Have you included a description of how this exemption claim meets the general rule for the use of exemptions (§ 106.4 checklist is available)?	☒ YES ☐ NO ☐ NA
Is the flare equipped with a tip designed to provide good mixing with air, flame stability and a tip velocity less than 60 ft/sec for gases having a lower heating value less than 1,000 BTU/ft^3, or less than 400 ft/sec for gases with a LHV greater than 1,000 BTU/ft^3?	☒ YES ☐ NO ☐ NA
Attach a description including BTU content and tip velocity (Table 8 is available).	
Is the flare equipped with a continuously burning pilot or other automatic ignition system that assures gas ignition whenever vents are directed to the flare?	☒ YES ☐ NO ☐ NA
Attach a description of the system.	
If the flare emits more than 4 lb/hr of reduced sulfur compounds, excluding sulfur oxides, is it equipped with an alarm system that immediately notifies appropriate personnel when the ignition system ceases functioning?	☐ YES ☐ NO ☒ NA
Attach a description of the system.	
If the flare emits less than 4 lb/hr of reduced sulfur compounds and is not equipped with an alarm system, does the stack height meet the requirements of condition (d) of §106.352, previously standard exemption STDX 66?	☒ YES ☐ NO ☐ NA
Required Height: 20	Actual Height: 30
If the flare burns gases containing more than 24 ppmv of sulfur, chlorine or compounds containing either element, is it located at least 1/4 mile from any recreational area, residence, or other structure not occupied or used solely by the owner or operator of the flare or owner of the property where the flare is located?	☒ YES ☐ NO ☐ NA
Attach a scaled map.	

Exemption § 106.492 Checklist
(Previously Standard Exemption 80)
Smokeless Gas Flares

Question/Description	Response
If the flare emits HCI, does the heat release (BRU/hr based on lower heating value) equal or exceed 2.73 x 10E5 x HCI emission rate (lb/hr)?	☐ YES ☐ NO ☒ NA
Attach calculations.	
If the flare emits SO2, does the heat release (BTU/hr based on lower heating value) equal or exceed 0.53 x 10E5 x SO2 emission rates (lb/hr)?	☒ YES ☐ NO ☐ NA
Attach calculations.	
Will you limit the flare to burning only combustible mixtures of gases containing only carbon, hydrogen, nitrogen, oxygen, sulfur, chlorine, or compounds derived from these elements?	☒ YES ☐ NO ☐ NA
Will the gas mixture always have a net or lower heating value of at least 200 BTU/ft3 prior to addition of air?	☒ YES ☐ NO ☐ NA
Do you understand and will you ensure that liquids shall never be burned in the flare?	☒ YES ☐ NO ☐ NA

Save Form Reset Form

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date:	2/25/2025	Permit Number:	165340	Regulated Entity No:	RN111314480
Area Name:	CONTINENTAL RESOURCES INC, WHISKEY RIVER N SECTION 59H CTB			Customer Reference No.:	CN603075706

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	
EPN	FIN	NAME		Pounds per Hour	TPY
(A)	(B)	(C)		(A)	(B)
HT1	HT1	Heater Treater (1.00 MMBtu/hr)	NOx	0.07	0.30
			CO	0.06	0.25
			VOC	<0.01	0.02
			SO_2	0.11	0.50
			PM_{10}	<0.01	0.02
HT2	HT2	Heater Treater (1.00 MMBtu/hr)	NOx	0.07	0.30
			CO	0.06	0.25
			VOC	<0.01	0.02
			SO_2	0.11	0.50
			PM_{10}	<0.01	0.02
HT3	HT3	Heater Treater (1.00 MMBtu/hr)	NOx	0.07	0.30
			CO	0.06	0.25
			VOC	<0.01	0.02
			SO_2	0.11	0.50
			PM_{10}	<0.01	0.02
HT-FLASH	HT-FLASH	Heater Treater Flash	VOC	1.09	4.76
			H_2S	<0.01	<0.01
VRT-FLASH	VRT-FLASH	VRT Flash	VOC	0.89	3.90
			H_2S	<0.01	<0.01
TANK1	TANK1	Oil Storage Tank (1,000-bbl)	VOC	0.59	0.62
			H_2S	<0.01	<0.01
TANK2	TANK2	Oil Storage Tank (1,000-bbl)	VOC	0.59	0.62
			H_2S	<0.01	<0.01
TANK3	TANK3	Produced Water Storage Tank (1,000-bbl)	VOC	0.03	0.03
			H_2S	<0.01	<0.01
TANK4	TANK4	Produced Water Storage Tank (1,000-bbl)	VOC	0.03	0.03
			H_2S	<0.01	<0.01

EPN = Emission Point Number FIN = Facility Identification Number

[a]VOC includes formaldehyde.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date:	2/25/2025	Permit Number:	165340	Regulated Entity No:	RN111314480
Area Name:	CONTINENTAL RESOURCES INC, WHISKEY RIVER N SECTION 59H CTB			Customer Reference No.:	CN603075706

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	
EPN	FIN	NAME		Pounds per Hour	TPY
(A)	(B)	(C)		(A)	(B)
FL1	FL1	LP Flare	NOx	1.35	0.53
			CO	2.70	1.06
			VOC	<0.01	<0.01
			SO_2	1.08	0.14
			PM_{10}	0.12	0.05
FL2	FL2	HP Flare	NOx	18.55	1.41
			CO	37.03	2.95
			VOC	45.43	3.46
			H_2S	0.18	0.01
			SO_2	16.57	1.26
			PM_{10}	--	--
LOAD1	LOAD1	Oil Loading Emissions	VOC	29.04	0.83
			H_2S	<0.01	<0.01
LOAD2	LOAD2	Produced Water Loading Emissions	VOC	1.51	0.06
			H_2S	<0.01	<0.01
FUG	FUG	Site Fugitives	VOC	1.15	5.03
			H_2S	<0.01	<0.01
MSS	MSS	Maintenance, Startup, Shutdown Emissions	VOC	68.60	5.08
			Sitewide HAP Total	--	<25
			Sitewide Individual HAP	--	<10

EPN = Emission Point Number FIN = Facility Identification Number

[a]VOC includes formaldehyde.

[TCEQ-10153 (Revised 04/08) Table 1(a)
(APDG 5178 v5)
WhiskeyRiverNSection59HCTB_Calcs_02202025.xlsx 2/25/2025

SUMMARY TABLE

ESTIMATED EMISSIONS																	
EPN/Emission Source	Specific VOC or Other Pollutants	VOC		NO_x		CO		PM_{10}		$PM_{2.5}$		H_2S		SO_2		Formaldehyde	
		lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
HT1 / Heater Treater (1.00 MMBtu/hr)		<0.01	0.02	0.07	0.30	0.06	0.25	<0.01	0.02	<0.01	0.02	--	--	0.11	0.50	--	--
HT2 / Heater Treater (1.00 MMBtu/hr)		<0.01	0.02	0.07	0.30	0.06	0.25	<0.01	0.02	<0.01	0.02	--	--	0.11	0.50	--	--
HT3 / Heater Treater (1.00 MMBtu/hr)		<0.01	0.02	0.07	0.30	0.06	0.25	<0.01	0.02	<0.01	0.02	--	--	0.11	0.50	--	--
HT-FLASH / Heater Treater Flash		1.09	4.76	--	--	--	--	--	--	--	--	<0.01	<0.01	--	--	--	--
VRT-FLASH / VRT Flash		0.89	3.90	--	--	--	--	--	--	--	--	<0.01	<0.01	--	--	--	--
TANK1 / Oil Storage Tank (1,000-bbl)		0.59	0.62	--	--	--	--	--	--	--	--	<0.01	<0.01	--	--	--	--
TANK2 / Oil Storage Tank (1,000-bbl)		0.59	0.62	--	--	--	--	--	--	--	--	<0.01	<0.01	--	--	--	--
TANK3 / Produced Water Storage Tank (1,000-bbl)		0.03	0.03	--	--	--	--	--	--	--	--	<0.01	<0.01	--	--	--	--
TANK4 / Produced Water Storage Tank (1,000-bbl)		0.03	0.03	--	--	--	--	--	--	--	--	<0.01	<0.01	--	--	--	--
FL1 / LP Flare		<0.01	<0.01	1.35	0.53	2.70	1.06	0.12	0.05	0.12	0.05	--	--	1.08	0.14	--	--
FL2 / HP Flare		45.43	3.46	18.55	1.41	37.03	2.95	--	--	--	--	0.18	0.01	16.57	1.26	--	--
LOAD1 / Oil Loading Emissions		29.04	0.83	--	--	--	--	--	--	--	--	<0.01	<0.01	--	--	--	--
LOAD2 / Produced Water Loading Emissions		1.51	0.06	--	--	--	--	--	--	--	--	<0.01	<0.01	--	--	--	--
FUG / Site Fugitives		1.15	5.03	--	--	--	--	--	--	--	--	<0.01	<0.01	--	--	--	--
MSS / Blasting and Coating Operations		8.13	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MSS / Well Venting & Liquids Unloading		0.41	1.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MSS / General MSS		60.06	3.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL EMISSIONS (TPY):			24.74		2.86		4.82		0.12		0.12		<0.01		2.89		0.00
MAXIMUM OPERATING SCHEDULE:		Hours/Day		24		Days/Week		7		Weeks/Year		52		Hours/Year		8760	

Note: VOC emission rates shown above include formaldehyde.

TABLE 1

POTENTIAL EMISSIONS SUMMARY
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

Emissions Source	EU-ID	NO_x		VOC		CO		$PM_{10}/PM_{2.5}$		SO_2		H_2S		TOTAL HAPs	
		(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
Heater Treater (1.00 MMBtu/hr)	HT1	0.07	0.30	0.004	0.02	0.06	0.25	0.01	0.02	0.11	0.50	--	--	0.000001	0.00001
Heater Treater (1.00 MMBtu/hr)	HT2	0.07	0.30	0.004	0.02	0.06	0.25	0.01	0.02	0.11	0.50	--	--	0.000001	0.00001
Heater Treater (1.00 MMBtu/hr)	HT3	0.07	0.30	0.004	0.02	0.06	0.25	0.01	0.02	0.11	0.50	--	--	0.000001	0.00001
Heater Treater Flash	HT-FLASH	--	--	1.09	4.76	--	--	--	--	--	--	0.0001	0.0005	0.04	0.16
VRT Flash	VRT-FLASH	--	--	0.89	3.90	--	--	--	--	--	--	0.0001	0.0004	0.0005	0.002
Oil Storage Tank (1,000-bbl)	TANK1	--	--	0.59	0.62	--	--	--	--	--	--	0.0001	0.0001	0.02	0.02
Oil Storage Tank (1,000-bbl)	TANK2	--	--	0.59	0.62	--	--	--	--	--	--	0.0001	0.0001	0.02	0.02
Produced Water Storage Tank (1,000-bbl)	TANK3	--	--	0.03	0.03	--	--	--	--	--	--	0.0001	0.0001	0.01	0.01
Produced Water Storage Tank (1,000-bbl)	TANK4	--	--	0.03	0.03	--	--	--	--	--	--	0.0001	0.0001	0.01	0.01
LP Flare	FL1	1.35	0.53	0.001	0.004	2.70	1.06	0.12	0.05	1.08	0.14	--	--	--	--
HP Flare	FL2	18.55	1.41	45.43	3.46	37.03	2.95	--	--	16.57	1.26	0.18	0.01	4.49	0.34
Oil Loading Emissions	LOAD1	--	--	29.04	0.83	--	--	--	--	--	--	0.003	0.0001	0.96	0.03
Produced Water Loading Emissions	LOAD2	--	--	1.51	0.06	--	--	--	--	--	--	0.01	0.0003	1.51	0.06
Site Fugitives	FUG	--	--	1.15	5.03	--	--	--	--	--	--	0.002	0.01	0.11	0.46
Blasting and Coating Operations	MSS	--	--	8.13	0.02	--	--	--	--	--	--	--	--	--	--
Well Venting & Liquids Unloading	MSS	--	--	0.41	1.82	--	--	--	--	--	--	--	--	0.01	0.04
General MSS	MSS	--	--	60.06	3.25	--	--	--	--	--	--	--	--	--	--
Total Facility Emissions		**20.11**	**2.86**	**149.00**	**24.74**	**39.91**	**4.82**	**0.14**	**0.12**	**17.99**	**2.89**	**0.19**	**0.02**	**7.15**	**1.16**

Note: General MSS is based on default TCEQ MSS calculations.

TABLE 2

POTENTIAL EMISSIONS
HEATER TREATERS (HT1 - HT3)
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

Pollutant	Max Firing Rate (MMBtu/hr)	Gas Heating Value (MMBtu/scf)	Emission Factors (lb/MMSCF) [1]	Potential Emission Rates [2]	
				(lb/hr)	(T/yr)
NOx	1.00	1,469	100.00	0.07	0.30
VOC	1.00	1,469	5.50	0.004	0.02
CO	1.00	1,469	84.00	0.06	0.25
PM	1.00	1,469	7.60	0.01	0.02
SO2	1.00	1,469	--	0.11	0.50
Formaldehyde	1.00	1,469	0.08	0.0001	0.0002
Benzene	1.00	1,469	0.002	0.000001	0.00001

Notes:

1. Emission factors obtained from AP-42 Table 1.4-1 through 1.4-3 for commercial boilers.
2. Potential emissions based on AP-42 emission factors, maximum firing rate, fuel heating value, and 8,760 hours per year of operation.

TABLE 3

POTENTIAL EMISSIONS SUMMARY
SO2 EMISSIONS FROM NATURAL GAS FIRED HEATERS (HT1 - HT3)
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC

Gas Flow Rate:	0.681	MCF/HR	(based on 1 MMBtu/hr and average heating value of 1469 Btu/scf)
Gas Flow Rate:	16.34	MCFD	(based on operating 24 hours per day)
H_2S Concentration:	1000	PPM	
Standard Pressure:	14.7	psi	
Gas Constant:	10.73	psi ft^3/lb mol/R	
Std Temp:	528	deg R	
H_2S Volume Constant:	11.1351	cu ft/lb	
H_2S Volume:	0.68	scf/hr	
Maximum Operating Hours:	8760	hours per year	

SO_2 Emissions:

$PV = nRT$

$$\text{lb mole } H_2S/\text{hr} = \frac{\text{Volume (V)} \times \text{Pressure (P)}}{\text{Gas Constant (R)} \times \text{Std Temp (T)}}$$

$$= 0.00177 \text{ lb mol } H_2S/\text{hr}$$

One Mole H_2S will form one mole SO_2:

$$SO_2 \text{ (lb/hr)} = \frac{\text{lb mol } H_2S/\text{hr} \times 1 \text{ lb mol } SO_2/\text{lb mol } H_2S}{1 \text{ lb mol } SO_2/64 \text{ lb}}$$

$$= \boxed{0.11 \text{ lb } SO_2/\text{hr}}$$

$$SO2 \text{ (T/yr)} = \frac{\text{lb SO2/hr} \times 8{,}760 \text{ hr/yr}}{2000 \text{ lb/T}}$$

$$= \boxed{0.50 \text{ T } SO_2/\text{yr}}$$

TABLE 4

POTENTIAL EMISSIONS
PROCESS VESSEL FLASH
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

Source	EU-ID	Total Annual Throughput [1]	Potential Emissions																							
			Total VOC Potential Emissions [2]		Total H2S Potential Emissions [2]		Total HAP Potential Emissions [2]		VRU Capture Efficiency [3]	VRU Downtime [3]	Flare Control Efficiency [3]	VOC Uncaptured Emissions [4]		HAP Uncaptured Emissions [4]		VOC Uncombusted Emissions [4]		H2S Uncombusted Emissions [4]		HAP Uncombusted Emissions [4]		Total VOC Emissions [6]		Total H2S Emissions [6]		Total HAP Emissions [6]	
		(bbls/year)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(%)	(%)	(%)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
Heater Treater Flash	HT-FLASH	247,835	36.21	158.61	0.005	0.02	1.63	7.15	99%	5%	98%	0.36	1.59	0.004	0.02	0.72	3.17	0.0001	0.0004	0.03	0.14	1.09	4.76	0.0001	0.0005	0.04	0.16
VRT Flash	VRT-FLASH	247,835	29.71	130.11	0.004	0.02	0.021	0.09	99%	5%	98%	0.30	1.30	0.00005	0.0002	0.59	2.60	0.0001	0.0004	0.0004	0.002	0.89	3.90	0.0001	0.0004	0.0005	0.002

Notes:

1. Based on annual throughput value of 247,835-bbl/yr of oil.
2. Emission factors from ProMax simulation.
3. Heater treater flash and VRT flash will be routed to the vapor recovery units (VRUs) during normal operation.
   To allow for maintenance, it is conservatively estimated the VRUs may be down 5% annually. During downtime emissions are routed to LP-FLARE.
4. Uncombusted emissions based on flash emissions routed to the control device, which has a control efficiency of 98%. Note that SO_2 emissions are accounted for under the LP-FLARE.

TABLE 5

POTENTIAL EMISSIONS
STORAGE TANKS
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

Source	EU-ID	Annual Throughput [1] (gallons/year)	Tank Capacity (gallons)	Potential VOC Emissions																	
				Annual Breathing Losses [2] (T/yr)	Annual Working Losses [2] (T/yr)	Annual Flash Losses [3] (T/yr)	Total Uncontrolled VOC Emissions (lb/hr)	Total Uncontrolled VOC Emissions (T/yr)	VRU1 Capture Efficiency [4] (%)	VRU1 Downtime [4] (%)	Uncaptured VRU Emissions [5] (lb/hr)	Uncaptured VRU Emissions [5] (T/yr)	VRU Downtime Emissions to Flare [6] (lb/hr)	VRU Downtime Emissions to Flare [6] (T/yr)	Flare Capture Efficiency [4] (%)	Uncaptured Tank Emissions [7] (lb/hr)	Uncaptured Tank Emissions [7] (T/yr)	Uncombusted Flare Emissions [8] (lb/hr)	Uncombusted Flare Emissions [8] (T/yr)	Total VOC Emissions [9] (lb/hr)	Total VOC Emissions [9] (T/yr)
Oil Storage Tank (1,000-bbl)	TANK1	5,204,535	42,000	3.27	23.84	24.78	11.85	51.90	99%	5%	0.12	0.52	11.85	2.59	98%	0.24	0.05	0.23	0.05	0.59	0.62
Oil Storage Tank (1,000-bbl)	TANK2	5,204,535	42,000	3.27	23.84	24.78	11.85	51.90	99%	5%	0.12	0.52	11.85	2.59	98%	0.24	0.05	0.23	0.05	0.59	0.62
Produced Water Storage Tank (1,000-bbl)	TANK3	7,527,030	42,000	0.06	0.72	1.46	0.51	2.25	99%	5%	0.01	0.02	0.51	0.11	98%	0.01	0.002	0.01	0.002	0.03	0.03
Produced Water Storage Tank (1,000-bbl)	TANK4	7,527,030	42,000	0.06	0.72	1.46	0.51	2.25	99%	5%	0.01	0.02	0.51	0.11	98%	0.01	0.002	0.01	0.002	0.03	0.03

Source	EU-ID	Potential H_2S Emissions													
		Total Uncontrolled H_2S Emissions [10] (lb/hr)	Total Uncontrolled H_2S Emissions [10] (T/yr)	VRU1 Capture Efficiency [4] (%)	VRU1 Downtime [4] (%)	Uncaptured VRU Emissions [5] (lb/hr)	Uncaptured VRU Emissions [5] (T/yr)	VRU Downtime Emissions to Flare [6] (lb/hr)	VRU Downtime Emissions to Flare [6] (T/yr)	Flare Capture Efficiency [4] (%)	Uncaptured Tank Emissions [7] (lb/hr)	Uncaptured Tank Emissions [7] (T/yr)	Uncombusted Flare Emissions [8] (lb/hr)	Uncombusted Flare Emissions [8] (T/yr)	Total H_2S Emissions [9] (lb/hr)	Total H_2S Emissions [9] (T/yr)
Oil Storage Tank (1,000-bbl)	TANK1	0.001	0.01	99%	5%	0.00001	0.0001	0.001	0.0003	98%	0.00003	0.00001	0.00003	0.00001	0.0001	0.0001
Oil Storage Tank (1,000-bbl)	TANK2	0.001	0.01	99%	5%	0.00001	0.0001	0.001	0.0003	98%	0.00003	0.00001	0.00003	0.00001	0.0001	0.0001
Produced Water Storage Tank (1,000-bbl)	TANK3	0.002	0.01	99%	5%	0.00002	0.0001	0.002	0.001	98%	0.00005	0.00001	0.00005	0.00001	0.0001	0.0001
Produced Water Storage Tank (1,000-bbl)	TANK4	0.002	0.01	99%	5%	0.00002	0.0001	0.002	0.001	98%	0.00005	0.00001	0.00005	0.00001	0.0001	0.0001

Source	EU-ID	Potential HAP Emissions													
		Total Uncontrolled HAP Emissions [10] (lb/hr)	Total Uncontrolled HAP Emissions [10] (T/yr)	VRU1 Capture Efficiency [4] (%)	VRU1 Downtime [4] (%)	Uncaptured VRU Emissions [5] (lb/hr)	Uncaptured VRU Emissions [5] (T/yr)	VRU Downtime Emissions to Flare [6] (lb/hr)	VRU Downtime Emissions to Flare [6] (T/yr)	Flare Capture Efficiency [4] (%)	Uncaptured Tank Emissions [7] (lb/hr)	Uncaptured Tank Emissions [7] (T/yr)	Uncombusted Flare Emissions [8] (lb/hr)	Uncombusted Flare Emissions [8] (T/yr)	Total HAP Emissions [9] (lb/hr)	Total HAP Emissions [9] (T/yr)
Oil Storage Tank (1,000-bbl)	TANK1	0.39	1.69	99%	5%	0.004	0.02	0.39	0.08	98%	0.01	0.002	0.01	0.002	0.02	0.02
Oil Storage Tank (1,000-bbl)	TANK2	0.39	1.69	99%	5%	0.004	0.02	0.39	0.08	98%	0.01	0.002	0.01	0.002	0.02	0.02
Produced Water Storage Tank (1,000-bbl)	TANK3	0.12	0.54	99%	5%	0.001	0.01	0.12	0.03	98%	0.002	0.001	0.002	0.001	0.01	0.01
Produced Water Storage Tank (1,000-bbl)	TANK4	0.12	0.54	99%	5%	0.001	0.01	0.12	0.03	98%	0.002	0.001	0.002	0.001	0.01	0.01

Notes:

1. Based on maximum annual oil throughput value of 247,835-bbl/yr and maximum annual produced water throughput value of 358,430-bbl/yr.
2. Annual breathing and working losses were determined using ProMax and AP-42 Section 7 equations.
3. Annual flash emissions from the storage tanks were determined using ProMax simulation.
4. Emissions from oil and water storage tanks will be routed to LP-FLARE during normal operations, which has a capture and control efficiency of 98%.
5. Uncaptured VRU Emissions = Uncontrolled Emissions x (1 - VRU Capture Efficiency (%)).
6. VRU Downtime Emissions to Flare (T/yr) = [Uncontrolled Emissions (T/yr) x VRU Downtime (%)]
7. Uncaptured Flare Emissions = Total Uncontrolled VOC/H2S/HAP Emissions x (1 - Capture Efficiency (%))
8. Uncombusted Emissions = Total Uncontrolled VOC/H2S/HAP Emissions x Capture Efficiency (%) x (1 - Control Efficiency (%))
9. Total VOC/H2S/HAP Emissions = Uncaptured Tank Emissions + Uncombusted Flare Emissions
10. H2S/HAP uncontrolled emissions determined using ProMax simulation.

TABLE 6

POTENTIAL EMISSIONS
FLARE (FL1)
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

Input Parameters for Emission Calculations[1]

Designed Max. Firing Rate	9.77	MMBtu/hr	Annual Avg. Firing Rate[3]	7661.02	MMBtu/yr
Operating Hours per Year	8,760	Hrs/Yr	Annual Avg. Natural Gas Usage[3]	4.60	MM Cubic Feet/Yr
Estimated Natural Gas Usage	0.0063	MM Cubic Feet/Hr			
Pilot Rate	150.0	scf/hr			

Pollutant	Emission Factor			Rate Per Hour		Emission Factor			Rate Per Hour			Total Emissions (lb/hr)	Total Emissions (T/yr)
NO_x[2]	0.14	lb NOx / MMBtu	x	9.77	MMBtu / Hr	0.0001	Ton NOx / MMBtu	x	7661.02	MMBtu / Yr	=	1.35	0.53
VOC[2]	5.50	lb PM / MMcf Natural Gas Burned	x	0.0002	MMcf / Hr	8,760	Hours / yr	x	1 / 2,000	ton / lbs	=	0.001	0.004
CO[2]	0.28	lb CO / MMBtu	x	9.77	MMBtu / Hr	0.0001	Ton CO / MMBtu	x	7661.02	MMBtu / Yr	=	2.70	1.06
PM[2]	19.70	lb PM / MMcf Natural Gas Burned	x	0.006	MMcf / Hr	0.01	Ton PM / MMcf Natural Gas Burned	x	4.60	MMcf / Yr	=	0.12	0.05
SO_2[2]	42.00	lb SO_2 / MMcf Natural Gas Burned	x	0.006	MMcf / Hr	0.02	Ton SO_2 / MMcf Natural Gas Burned	x	4.6006	MMcf / Yr	=	0.27	0.10
SO_2[3]	0.43	lb H2S / hr	x	64 / 34	lb SO2/lb-mol / lb H2S/lb-mol	44.54	lb H2S / yr	x	64 / 34	lb SO2/lb-mol / lb H2S/lb-mol	=	0.82	0.04
											Total SO_2	**1.08**	**0.14**

Notes:

1. Input Parameters:

Estimated Max. Heat Input (MMBTU/Hr) is the sum of:

Pilot	Gas Rate (scf/hr) x Heating Value (btu/scf) / 1,000,000	=	0.22
HT Flash	ProMax Gas Rate (scf/hr) x Heating Value (btu/scf) / 1,000,000	=	1.27
VRT Flash	ProMax Gas Rate (scf/hr) x Heating Value (btu/scf) / 1,000,000	=	0.85
Oil Tank Flash	ProMax Gas Rate (scf/hr) x Heating Value (btu/scf) / 1,000,000 x Cap. Eff. (%)	=	0.29
Oil Tank W/B	Total Tank W/B VOC (lb/hr) x Cap. Eff. (%) x 379.4 (scf/lb-mol) / Molecular Wt. of vapors (lb/lb-mol) x Heat Value (btu/scf) / 1,000,000	=	0.25
Water Tank Flash	ProMax Gas Rate (scf/hr) x Heating Value (btu/scf) / 1,000,000 x Cap. Eff. (%)	=	0.04
Water Tank W/B	Total Tank W/B VOC (lb/hr) x Cap. Eff. (%) x 379.4 (scf/lb-mol) / Molecular Wt. of vapors (lb/lb-mol) x Heat Value (btu/scf) / 1,000,000	=	0.08
Liquids Unloading	Gas Volume/Blowdown (scf) x Heating Value (btu/scf) / 1,000,000 / 8 Hours Per Event	=	6.77
	Total	**=**	**9.77**

Estimated Max. Gas Burned (MMCF/Hr) is the sum of:

Pilot	Gas Rate (scf/hr) x 8760 (hr) / 1,000,000	=	0.0002
HT Flash	ProMax Gas Rate (MMSCFD) / 24	=	0.001
VRT Flash	ProMax Gas Rate (MMSCFD) / 24	=	0.0004
Oil Tank Flash	ProMax Gas Rate (MMSCFD) / 24 x Cap. Eff. (%)	=	0.0001
Oil Tank W/B	Total Tank W/B VOC (lb/hr) x Capture Eff. (%) x 379.4 (scf/lb-mol) / Molecular Wt. of vapors (lb/lb-mol)	=	0.0001
Water Tank Flash	ProMax Gas Rate (MMSCFD) / 24 x Cap. Eff. (%)	=	0.00004
Water Tank W/B	Total Tank W/B VOC (lb/hr) x Capture Eff. (%) x 379.4 (scf/lb-mol) / Molecular Wt. of vapors (lb/lb-mol)	=	0.0001
Liquids Unloading	Gas Volume/Blowdown (scf) / 1,000,000 / 8 Hours Per Year	=	0.005
	Total	**=**	**0.01**

2. NOx and CO emission factors obtained from TCEQ Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers, October 2000 RG-109 (Draft), Table 4, high Btu, "other" flare type. VOC, PM, and SO_2 emission factors obtained from AP-42 for Natural Gas Combustion, Table 1.4-1, (7/98) < 100 MMBtu/hr heat input; & Table 1.4-2, (7/98). VOC is pilot gas only. VOC from controlled sources is represented at the source.
3. Vapors from heater treater flash, VRT flash, oil storage tanks, and produced water storage tanks are routed to the flare. Uncombusted VOC is represented at the storage tanks. Vapors from well liquid unloading are routed to the LP-FLARE. It is assumed that each event lasts 8 hours and is 100% captured. Uncombusted VOC, HAP, and H_2S is represented at the source. It is conservatively assumed that all captured H_2S is converted to SO_2.

TABLE 7

POTENTIAL EMISSIONS
PRODUCED GAS FLARING - HOURLY (HP-FLARE)
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

FLARE FEED AND EXHAUST RATES - (FL2)										
Control Feed Rates and Composition						Control Exhaust				
Inlet Gas		MCF/Hr	Cu Ft/ #	lbs/hr	Control DRE%	lb/hr[2]	Component BTU/SCF	Heat Release MMBtu/hr	**FLARE EMISSION RATES**	
N2	1.1163%	1.116	13.5460	82.41	0.00%	82.4081	0.0	0.000	TCEQ Flare NOx factor[4]:	0.1380 lb/MMBtu
CO2	0.5281%	0.528	8.6229	61.24	0.00%	61.2439	0.0	0.000	TCEQ Flare CO factor[4]:	0.2755 lb/MMBtu
H2S	0.1000%	0.100	11.1351	8.98	98.00%	0.1796	586.8	0.059		
SO2[3]	--	--	--	--	--	16.5666	--	--		
C1	69.8352%	69.835	23.6540	2952.36	99.00%	29.5236	909.4	63.508	NOx emissions from control:	18.53 lbs/hour
C2	11.2822%	11.282	12.6200	893.99	99.00%	8.9399	1618.7	18.262	CO emissions from control:	36.99 lbs/hour
C3	7.5031%	7.503	8.6059	871.86	99.00%	8.7186	2314.9	17.369	SO2 emissions from control:	16.57 lbs/hour
IC4	0.9246%	0.925	6.5291	141.61	98.00%	2.8322	3000.4	2.774		
NC4	2.8973%	2.897	6.5291	443.75	98.00%	8.8750	3010.8	8.723		
IC5	0.9216%	0.922	5.2596	175.22	98.00%	3.5044	3699.0	3.409		
NC5	1.0276%	1.028	5.2596	195.38	98.00%	3.9075	3706.9	3.809		
Benzene	0.1646%	0.165	4.8581	33.88	98.00%	0.6776	3707.9	0.610	Control Volume	100.00 MCF/HR
Toluene	0.1755%	0.176	4.1184	42.61	98.00%	0.8523	3708.9	0.651		2400 MCF/D
Ethylbenzene	0.0180%	0.018	3.5744	5.04	98.00%	0.1007	3709.9	0.067		
Xylenes	0.0254%	0.025	3.5744	7.11	98.00%	0.1421	3710.9	0.094		
n-Hexane	0.5973%	0.597	4.4035	135.64	98.00%	2.7128	3711.9	2.217		
C6+	2.8829%	2.883	4.4035	654.68	98.00%	13.0937	4403.8	12.696		
Total	100.00%	100.0	--	--	--	244.2788	--	134.249	Total Volume[1]	100.00 MCF/HR
Total VOC	--	--	--	--	--	45.4171	--	--		

Notes:

1. Volume (MCF/Hr) is based on flaring 100 Mcf per hour of gas.
2. Control Exhaust (lb/hr) = Volume (MCF/hr) x constituent composition (%) x 1000 / Cu Ft/# x (100-Flare DRE (%))
3. Conservatively assumes that one mole H_2S will form one mole SO_2. SO_2 (lb/hr) = H_2S (lb/hr) x (64 lb SO_2/lb-mol / 34 lb H_2S/lb-mol)
4. Flare CO and NOx emission factors from TCEQ Air Permit Techincal Guidance for Chemical Sources: Flares and Vapor Oxidizers, October 2000 RG-109 (Draft), Table 4, high Btu, "other" flare type.

TABLE 8

POTENTIAL EMISSIONS
PRODUCED GAS FLARING - ANNUAL (FL2)
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

FLARE FEED AND EXHAUST RATES - (FL2)

Control Feed Rates and Composition					Control DRE%	Control Exhaust Components	Component BTU/SCF	Heat Release MMBtu/yr
Inlet Gas		MCF/YR	Cu Ft/ #	lbs/yr		T/yr		
N2	1.1163%	167.445	13.5460	12361.21	0.00%	6.1806	0.0	0.000
CO2	0.5281%	79.215	8.6229	9186.58	0.00%	4.5933	0.0	0.000
H2S	0.1000%	15.000	11.1351	1347.09	98.00%	0.0135	586.8	8.802
SO2[3]	--	--	--	--	--	1.2425	--	--
C1	69.8352%	10475.280	23.6540	442854.49	99.00%	2.2143	909.4	9526.220
C2	11.2822%	1692.330	12.6200	134099.05	99.00%	0.6705	1618.7	2739.375
C3	7.5031%	1125.465	8.6059	130778.30	99.00%	0.6539	2314.9	2605.339
IC4	0.9246%	138.690	6.5291	21241.83	98.00%	0.2124	3000.4	416.125
NC4	2.8973%	434.595	6.5291	66562.77	98.00%	0.6656	3010.8	1308.479
IC5	0.9216%	138.240	5.2596	26283.37	98.00%	0.2628	3699.0	511.350
NC5	1.0276%	154.140	5.2596	29306.41	98.00%	0.2931	3706.9	571.382
Benzene	0.1646%	24.690	4.8581	5082.23	98.00%	0.0508	3707.9	91.548
Toluene	0.1755%	26.325	4.1184	6392.05	98.00%	0.0639	3708.9	97.637
Ethylbenzene	0.0180%	2.700	3.5744	755.37	98.00%	0.0076	3709.9	10.017
Xylenes	0.0254%	3.810	3.5744	1065.91	98.00%	0.0107	3710.9	14.139
n-Hexane	0.5973%	89.595	4.4035	20346.32	98.00%	0.2035	3711.9	332.568
C6+	2.8829%	432.435	4.4035	98202.57	98.00%	0.9820	4403.8	1904.357
Total	100.00%	15000	--	--	--	18.3209	--	20137.336
Total VOC	--		--		--	3.4063	--	--

FLARE EMISSION RATES		
TCEQ Flare NOx factor[4]:	0.1380	lb/MMBtu
TCEQ Flare CO factor[4]:	0.2755	lb/MMBtu
NOx emissions from control:	1.39	T/yr
CO emissions from control:	2.77	T/yr
SO2 emissions from control:	1.24	T/yr
Control Volume[1]	15,000	MCF/YR
Total Volume	15,000	MCF/YR

Notes:

1. Volume (MCF/Hr) is based on flaring 15,000 Mcf per year of gas.
2. Control Exhaust (lb/hr) = Volume (MCF/hr) x constituent composition (%) x 1000 / Cu Ft/# x (100-Flare DRE (%))
3. Conservatively assumes that one mole H_2S will form one mole SO_2. SO_2 (lb/hr) = H_2S (lb/hr) x (64 lb SO_2/lb-mol / 34 lb H_2S/lb-mol)
4. Flare CO and NOx emission factors from TCEQ Air Permit Techincal Guidance for Chemical Sources: Flares and Vapor Oxidizers, October 2000 RG-109 (Draft), Table 4, high Btu, "other" flare type.

TABLE 9

POTENTIAL EMISSIONS
TRUCK LOADING (LOADING1, LOADING2)
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

Material Name	EU-ID	Saturation Factor [1] (S)	True Vapor Pressure [2] (P)		Molecular Weight of Vapors [2] (M)	Temp of Loaded Liquid [2] (F)		Emission Factor [1] (lb VOC/10^3 gal)		Annual Throughput [3] (gals)	Estimated Hourly Throughput [3] (gal)	Weight Percent of VOC in HC Vapors (%)	Total Uncontrolled VOC Emissions		Weight Percent of H2S in VOC Vapors [6] (%)	Total Uncontrolled H2S Emissions [7]		Weight Percent of HAP in VOC Vapors [6] (%)	Total Controlled HAP Emissions [6]	
			Max	Avg	(lb/lb-mole)	Max	Avg	Max	Avg				(lb/hr) [4]	(T/yr) [5]		(lb/hr)	(T/yr)		(lb/hr)	(T/yr)
Oil	LOAD1	0.6	7.68	6.37	43	95	66.55	4.45	3.89	520,454	8,000	81.58%	29.04	0.83	0.01%	0.003	0.0001	3.29%	0.96	0.03
Produced Water	LOAD2	0.6	0.58	0.45	24	95	66.55	0.19	0.15	752,703	8,000	100.00%	1.51	0.06	0.52%	0.01	0.0003	100.00%	1.51	0.06

Notes:

1. Per AP-42, 5th Edition (6/08), Section 5.2, Equation 1

$$\text{Emission Factor (lb VOC/10}^3\text{gal)} = \frac{S \times P \times M \times 12.46}{F + 460}$$

Saturation Factor = 0.6 for submerged loading: dedicated normal service

2. True vapor pressure, weight of vapors and temp of loaded liquid obtained from AP-42 Section 7 using factors from ProMax.
3. Throughput is the amount of oil and water loaded out from the storage tanks. It is estimated that one truck can load 8,000 gallons in one hour.
   Oil and Produced water are mainly transferred offsite via pipeline. 5% truck loading for produced water and 5% for crude oil is used to conservatively to estimate emissions and allow for flexibility.
4. Uncontrolled Hourly VOC Emissions = Estimated Hourly Throughput (gal/hr) x Max Emission Factor (lb VOC/10^3 gal) / 1000 x VOC in Vapors (%).
5. Uncontrolled Annual VOC Emissions = Annual Throughput (gal) x Avg Emission Factor (lb VOC/10^3 gal) / 1000 / 2000 (lb/T) x VOC in Vapors (%).
6. Total HAP in VOC based on ProMax.

TABLE 10

POTENTIAL EMISSIONS FROM MSS ACTIVITIES (MSS)
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

Summary of MSS Activities						
Activity	VOC[1]		PM		Other HAPs	
	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
Engine, compressor, turbine and other combustion facilities maintenance	0.06	0.25	-	-	-	-
Repair, adjustment, calibration, lubrication and cleaning of site process equipment			-	-	-	-
Replacement of piping components, pneumatic controllers, boiler refractories, wet and dry seals, meters, instruments, analyzers, screens and filters			-	-	-	-
Turbine or engine component swaps			-	-	-	-
Piping used to bypass a facility during maintenance			-	-	-	-
Pigging and purging of piping	142.69	0.71	-	-	-	-
Abrasive blasting, surface preparation and surface coating of facilities and structures used at the site	8.13	0.02	0.68	0.001	0.08	0.0002
Misc. MSS activities	60.00	3.00	--	--	--	--
Total =	**210.87**	**3.98**	**0.68**	**0.001**	**0.08**	**0.0002**

MSS - Pigging Operations

Description	Pigging
Number of Events per Year	10
Number of Events per hour	1
Volume per Event, scf	5000
Stream Specific Gravity	0.8892
Air MW, lb/mole	28.96
Fuel Stream Density, lb/scf	0.068
VOC Percentage in Gas Stream, wt%	42.00%
VOC Hourly Emission Rate (lb/hr):	142.69
VOC Annual Emission Rate (T/yr):	0.71

MSS - Sandblasting

Description	Sandblasting	
Application Rate[1]	2,000	lb/hr
Operating Hours	4	hr/yr
PM10 Emission Factor[1]	0.00034	lb/lb usage
PM2.5 Emission Factor[1]	0.00005	lb/lb usage
PM10 Emissions	**0.68**	**lb/hr**
PM10 Emissions	**0.001**	**T/yr**
PM2.5 Emissions	**0.10**	**lb/hr**
PM2.5 Emissions	**<0.01**	**T/yr**

MSS - Solvent Cleaning

Description	Solvent Cleaning	
Annual Usage	5	gal/yr
Maximum Hourly Usage	1	gal/hr
Density	6.5	lb/gal
VOC Wt%	100%	-
Dipropylene Glycol Methyl Ether Wt%	1%	-
HAP Emissions	**0.08**	**lb/hr**
HAP Emissions	**0.0002**	**T/yr**
VOC Emissions	**8.13**	**lb/hr**
VOC Emissions	**0.02**	**T/yr**

Notes:
1. Defaults from TCEQ emissions spreadsheet.

TABLE 11

POTENTIAL EMISSIONS FROM WELL VENTING & LIQUIDS UNLOADING (MSS)
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

Avg. Tubing or Casing Depth (ft.): 10,321
Avg. Tubing/Casing Dia. (In.): 2.37
Avg. Shut-in Pressure (psi): 303

Total Well Workover/Blowdown Volume (all wells combined)	36,874	scf/blowdowns	*Volume to blowdown/unload all wells, one time each*
Gas Molecular Weight	26	lb/lb-mole	*Inlet gas analysis*
Total mass from blowdown of all wells combined (one time for each well)	1.25	TPY/blowdowns	*=(scf/blowdowns/379.4(ft3/lb-mol)) * MW (lb/lb-mol)/2000 (lb/ton)*
Heat Content	1,469	Btu/scf	*Inlet gas analysis*
Weight % VOC	42.00%	percent	*Inlet gas analysis*
Weight % HAP	0.98%	percent	*Inlet gas analysis*
Weight % Benzene	0.16%	percent	*Inlet gas analysis*
Weight % Toluene	0.18%	percent	*Inlet gas analysis*
Weight % Ethylbenzene	0.02%	percent	*Inlet gas analysis*
Weight % Xylenes	0.03%	percent	*Inlet gas analysis*
Weight % n-Hexane	0.60%	percent	*Inlet gas analysis*
Weight % H2S	0.13%	percent	*Inlet gas analysis*

Emissions from Well Venting/Blowdowns to Atmosphere			
Number of times each well is blown down/vented to atmosphere per year	3	#	
VOC	1.57	TPY	*=TPY/blowdowns X # blowdowns/yr X %*
HAP	0.04	TPY	*=TPY/blowdowns X # blowdowns/yr X %*
Benzene	0.01	TPY	*=TPY/blowdowns X # blowdowns/yr X %*
Toluene	0.01	TPY	*=TPY/blowdowns X # blowdowns/yr X %*
Ethylbenzene	0.001	TPY	*=TPY/blowdowns X # blowdowns/yr X %*
Xylenes	0.001	TPY	*=TPY/blowdowns X # blowdowns/yr X %*
n-Hexane	0.02	TPY	*=TPY/blowdowns X # blowdowns/yr X %*
H2S	0.005	TPY	*=TPY/blowdowns X # blowdowns/yr X %*

Gas vented to LP FLARE from Liquid Unloading Events			
Number of times per year that each well is blown down to combustor	12	#	
Heat flow to Flare	650	MMBtu/yr	*=scf/blowdowns X blowdowns/yr X Btu/scf / 1,000,000*
VOC to Flare	6.27	TPY	*=TPY/blowdowns X # blowdowns/yr X %*
HAP to Flare	0.15	TPY	*=TPY/blowdowns X # blowdowns/yr X %*
Benzene to Flare	0.02	TPY	*=TPY/blowdowns X # blowdowns/yr X %*
Toluene to Flare	0.03	TPY	*=TPY/blowdowns X # blowdowns/yr X %*
Ethylbenzene to Flare	0.003	TPY	*=TPY/blowdowns X # blowdowns/yr X %*
Xylenes to Flare	0.004	TPY	*=TPY/blowdowns X # blowdowns/yr X %*
n-Hexane to Flare	0.09	TPY	*=TPY/blowdowns X # blowdowns/yr X %*
H2S to Flare	0.02	TPY	*=TPY/blowdowns X # blowdowns/yr X %*

Controlled Emissions from Liquid Unloading Events [1]			
VOC	**0.25**	TPY	
HAP	**0.01**	TPY	
Benzene	**0.001**	TPY	
Toluene	**0.001**	TPY	
Ethylbenzene	**0.0001**	TPY	
Xylenes	**0.0002**	TPY	
n-Hexane	**0.004**	TPY	
H2S	**0.001**	TPY	

1. Emissions to Flare x (1 - Capture Efficiency (%)) + Emissions to Flare x Capture Efficiency (%) x (1 - Control Efficiency (%))

TABLE 12

POTENTIAL EMISSIONS
SITEWIDE FUGITIVES (FUG)
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

Component Type	Type of Service	Estimated Equipment At Site [1]	Emission Factor lb/hr/component [2]	% VOC [3]	% HAP [3]	VOC Emissions		H2S Emissions		HAP Emissions	
						(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
Flanges	Gas	422	0.000860	42.00%	3.38%	0.15	0.67	0.0005	0.002	0.01	0.05
	Light Oil	135	0.000243	99.67%	11.02%	0.03	0.14	0.0000001	0.0000003	0.004	0.02
	Water/Oil	60	0.000006	99.67%	11.02%	0.0004	0.002	0.000000001	0.000000003	0.00004	0.0002
Valves	Gas	100	0.009920	42.00%	3.38%	0.42	1.82	0.001	0.01	0.03	0.15
	Light Oil	38	0.005500	99.67%	11.02%	0.21	0.90	0.0000004	0.000002	0.02	0.10
Connectors	Gas	224	0.000440	42.00%	3.38%	0.04	0.18	0.0001	0.001	0.003	0.01
	Light Oil	270	0.000463	99.67%	11.02%	0.12	0.55	0.0000003	0.000001	0.01	0.06
	Water/Oil	120	0.000243	99.67%	11.02%	0.03	0.13	0.0000001	0.0000003	0.003	0.01
Open-Ended Lines	Gas	20	0.004410	42.00%	3.38%	0.04	0.16	0.0001	0.0005	0.003	0.01
Other	Gas	8	0.019400	42.00%	3.38%	0.06	0.27	0.0002	0.001	0.005	0.02
	Light Oil	1	0.016500	99.67%	11.02%	0.02	0.07	0.00000003	0.0000001	0.002	0.01
	Water/Oil	1	0.030900	99.67%	11.02%	0.03	0.13	0.0000001	0.0000003	0.003	0.01
Total Component Count		**1398**			**Total**	**1.15**	**5.03**	**0.002**	**0.01**	**0.11**	**0.46**

Notes:

1. Number of each component and type of service estimated based on a similar site.
2. Emission factors based on EPA's oil and gas production operations factors for process piping fugitive emissions.
3. Percent VOC, H2S, and HAP based on a representative sample and ProMax (refer to Tables 13 & 14).

TABLE 13

GAS ANALYSIS
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

Component	Molecular Weight	Mole % [1]	lb/100 mole	Wt % Total	Wt % Hydrocarbon	Wt % VOC [2]
Hydrogen Sulfide	34.08	0.10%	0.03	0.13%	--	--
Water	18.01	0.00%	0.00	0.00%	--	--
Nitrogen	28.01	1.12%	0.31	1.22%	--	--
Carbon Dioxide	44.01	0.53%	0.23	0.90%	--	--
Methane	16.04	69.84%	11.20	43.57%	43.57%	--
Ethane	30.07	11.28%	3.39	13.20%	13.20%	--
Propane	44.10	7.50%	3.31	12.87%	12.87%	13.15%
i-Butane	58.12	0.92%	0.54	2.09%	2.09%	2.14%
n-Butane	58.12	2.90%	1.68	6.55%	6.55%	6.69%
i-Pentane	72.15	0.92%	0.66	2.59%	2.59%	2.64%
n-Pentane	72.15	1.03%	0.74	2.88%	2.88%	2.95%
Cyclopentane	70.10	0.00%	0.00	0.00%	0.00%	0.00%
Other Hexanes	86.17	1.36%	1.17	4.55%	4.55%	4.65%
Heptanes	100.20	0.94%	0.94	3.66%	3.66%	3.74%
Octanes+	114.23	0.59%	0.67	2.61%	2.61%	2.66%
Benzene	78.11	0.16%	0.13	0.50%	0.50%	0.51%
Toluene	92.14	0.18%	0.16	0.63%	0.63%	0.64%
Ethylbenzene	106.17	0.018%	0.019	0.074%	0.074%	0.076%
Xylenes	106.17	0.03%	0.03	0.10%	0.10%	0.11%
n-Hexane	86.17	0.60%	0.51	2.00%	2.00%	2.05%
Total	--	100.00%	25.71	100.00%	97.88%	42.00%

Notes:

1. Representative gas analysis and extended HAPs based on a sample taken 06/23/2023
2. Wt % VOC is the VOC % in the hydrocarbon portion of the gas.

TABLE 14

LIQUID ANALYSIS
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

Component	Molecular Weight	Mole % [1]	lb/100 mole	Wt % Total	Wt % Hydrocarbon	Wt % VOC [2]
Hydrogen Sulfide	34.08	0.001%	0.0002	0.0002%	--	--
Water	18.01	0.00%	0.00	0.00%	--	--
Nitrogen	28.01	0.0002%	0.00004	0.0001%	--	--
Carbon Dioxide	44.01	0.01%	0.01	0.01%	--	--
Methane	16.04	0.12%	0.02	0.02%	0.02%	--
Ethane	30.07	0.91%	0.27	0.31%	0.31%	--
Propane	44.10	3.61%	1.59	1.81%	1.81%	1.81%
i-Butane	58.12	1.14%	0.66	0.76%	0.76%	0.76%
n-Butane	58.12	4.93%	2.87	3.26%	3.26%	3.26%
i-Pentane	72.15	2.91%	2.10	2.39%	2.39%	2.39%
n-Pentane	72.15	3.84%	2.77	3.16%	3.16%	3.16%
Other Hexanes	86.17	5.88%	5.07	5.77%	5.77%	5.77%
Heptanes	100.20	9.42%	9.43	10.74%	10.74%	10.74%
Octanes+	114.23	46.72%	53.36	60.75%	60.75%	60.76%
Benzene	78.11	0.85%	0.66	0.75%	0.75%	0.75%
Toluene	92.14	2.94%	2.71	3.09%	3.09%	3.09%
Ethylbenzene	106.17	0.83%	0.88	1.00%	1.00%	1.00%
Xylenes	106.17	1.46%	1.55	1.76%	1.76%	1.76%
n-Hexane	86.17	4.50%	3.88	4.42%	4.42%	4.42%
Total	--	90.07%	87.84	100.00%	99.99%	99.67%

Notes:

1. Liquid analysis based on ProMax.
2. Wt % VOC is the VOC % in the hydrocarbon portion of the gas.

TABLE 15

FLARE COMPLIANCE DOCUMENTATION CHECK
FL1 AND FL2
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

FL1 FEED AND EMISSION RATES				
	Gas to Flare[1] (CFM)	Tip Area (ft^2)	Tip Velocity[2] (ft/sec)	Gas Heating Value[3] (Btu/scf)
Pilot	2.5	--	--	1469.20
HT Flash	12.74	--	--	1659.74
VRT Flash	7.06	--	--	2007.17
Oil Tank Flash	2.15	--	--	2232.32
Oil Tank W/B	1.78	--	--	2312.57
Water Tank Flash	0.59	--	--	1190.09
Water Tank W/B	1.73	--	--	740.98
Liquids Unloading	1.73	--	--	1469.20
Total:	30.29	0.09	5.786	

FL1 TIP INFO/AREA		
Number of Flare Tips:	1	
Shape of Flare Tip:	circular	
Diameter of Flare Tip:	4.00	in
Radius of Flare Tip:	0.167	ft
Area of Circle:	πr^2	
Area of Flare Tip[4]:	0.09	ft^2

FL2 FEED AND EMISSION RATES				
	Gas to Flare[1] (CFM)	Tip Area (ft^2)	Tip Velocity[2] (ft/sec)	Gas Heating Value[3] (Btu/scf)
Pilot	1.67			1469.20
Sales Gas Flaring	1666.67	--	--	1342.49
Total:	1668.33	0.09	318.628	

FL2 TIP INFO/AREA		
Number of Flare Tips:	1	
Shape of Flare Tip:	circular	
Diameter of Flare Tip:	4.00	in
Radius of Flare Tip:	0.167	ft
Area of Circle:	πr^2	
Area of Flare Tip[4]:	0.09	ft^2

Notes:
1. Gas to Flare (CFM) = (Volume of Stream to Flare (MCF/Hr) x 1000 cu. Ft/MCF) / 60 sec/1 min.
2. Tip Velocity (ft/sec) = (Total Gas to Flare (CFM) x 1 min/60 sec) / Tip Area (ft^2)
3. Gas Heating Value (Btu/scf) = (Total Heat Release of Stream (MMBtu/Hr) x 1000000 Btu/MMBtu) / (Volume of Stream to Flare (MCF/Hr) x 1000 scf/MCF)
4. Area of Flare Tip (ft^2) = PI x (Radius of Flare Tip (ft))^2 x Number of Flare Tips

TABLE 16

SCREEN MODELING INPUTS AND RESULTS - H2S & SO2
WHISKEY RIVER N SECTION 59H CTB
CONTINENTAL RESOURCES INC
WARD COUNTY, TEXAS

	MSS, TANKS, LOADING, & FUGITIVES		HT1		FL1		FL2	
Inputs								
H2S Emission Rate	0.0005 lb/hr H2S	-- g/sec	-- lb/hr H2S	-- g/sec	0.00011 lb/hr H2S	0.0000 g/sec	0.180 lb/hr H2S	0.0226 g/sec
SO_2 Emission Rate	-- lb/hr SO_2	-- g/sec	0.113 lb/hr SO_2	0.014241 g/sec	2.8179 lb/hr SO_2	0.355061 g/sec	16.5708 lb/hr SO_2	2.087919 g/sec
Release Height	25.00 ft	7.6200 m			--	--	--	--
Longer Side Length	300.00 ft	91.4400 m			--	--	--	--
Shorter Side Length	200.00 ft	60.9600 m			--	--	--	--
Stack Height	--	--	30 ft	9.1440 m	30 ft	9.14 m	30 ft	9.14 m
Stack Inside Diameter	--	--	8 ft	2.4384 m	-- ft	-- m	-- ft	-- m
Heat Rating	--	--	--	--	9,766,112 Btu/hr		134,395,824 Btu/hr	
Stack Exit Velocity	--	--	60.00 ft/sec	18.2880 m/sec	--	--	--	--
Stack Gas Exit Temp	--	--	400 º F	477.5944 º K	--	--	--	--
Ambient Air Temp	--	293 º K	--	293 º K	--	293 º K	--	293 º K
Receptor Height	0 ft	0 m	0 ft	0 m	0 ft	0 m	0 ft	0 m
Urban/Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Rural
Downwash	None	None	None	None	None	None	None	None
Number of Identical Emission Points		--		1		1		1
Modeled Concentration at 1 lb/hr		125.5 µg/m^3		28.9 µg/m^3		2.8 µg/m^3		0.23 µg/m^3
Screen Modeling Results H2S								
Maximum 30-min Modeled Concentration at Property Line		0.06 µg/m^3		-- µg/m^3		0.0003 µg/m3		0.04 µg/m3
Number of Identical Units		1		1		1		1
Total 30-min Modeled Concentration		0.10 µg/m^3						
Is Total Concentration less than 162 µg/m^3 (0.12 ppm)?		**Yes**						
Screen Modeling Results SO2								
Maximum 30-min Modeled Concentration		-- µg/m^3		3.27 µg/m^3		7.90 µg/m3		3.79 µg/m3
Background		50.00 µg/m^3						
Total 30-min Modeled Concentration		64.95 µg/m^3						
Is Total Concentration less than 196 µg/m^3?		**Yes**						

02/10/25
15:19:39

```
 ***  SCREEN3 MODEL RUN  ***
 *** VERSION DATED 13043 ***

MSS, Tanks, Loading, Fugitives

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE                =          AREA
   EMISSION RATE (G/(S-M**2))  =     0.226040E-04
   SOURCE HEIGHT (M)           =       7.6200
   LENGTH OF LARGER SIDE (M)   =      91.4400
   LENGTH OF SMALLER SIDE (M)  =      60.9600
   RECEPTOR HEIGHT (M)         =       0.0000
   URBAN/RURAL OPTION          =        RURAL
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

   MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION


BUOY. FLUX =    0.000 M**4/S**3;  MOM. FLUX =    0.000 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***
```

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
1.	27.68	1	1.0	1.0	320.0	7.62	6.
100.	119.3	3	1.0	1.0	320.0	7.62	22.
200.	123.8	5	1.0	1.0	10000.0	7.62	23.
300.	119.6	5	1.0	1.0	10000.0	7.62	3.
400.	125.3	6	1.0	1.0	10000.0	7.62	14.
500.	118.2	6	1.0	1.0	10000.0	7.62	0.
600.	106.0	6	1.0	1.0	10000.0	7.62	1.
700.	93.25	6	1.0	1.0	10000.0	7.62	0.
800.	82.09	6	1.0	1.0	10000.0	7.62	0.
900.	72.50	6	1.0	1.0	10000.0	7.62	0.
1000.	64.34	6	1.0	1.0	10000.0	7.62	0.
1100.	57.55	6	1.0	1.0	10000.0	7.62	0.
1200.	51.79	6	1.0	1.0	10000.0	7.62	0.
1300.	46.88	6	1.0	1.0	10000.0	7.62	0.
1400.	42.62	6	1.0	1.0	10000.0	7.62	0.
1500.	38.96	6	1.0	1.0	10000.0	7.62	0.

1600.	35.77	6	1.0	1.0	10000.0	7.62	0.
1700.	32.95	6	1.0	1.0	10000.0	7.62	0.
1800.	30.48	6	1.0	1.0	10000.0	7.62	0.
1900.	28.31	6	1.0	1.0	10000.0	7.62	0.
2000.	26.37	6	1.0	1.0	10000.0	7.62	0.
2100.	24.70	6	1.0	1.0	10000.0	7.62	0.
2200.	23.22	6	1.0	1.0	10000.0	7.62	0.
2300.	21.89	6	1.0	1.0	10000.0	7.62	0.
2400.	20.68	6	1.0	1.0	10000.0	7.62	0.
2500.	19.57	6	1.0	1.0	10000.0	7.62	0.
2600.	18.55	6	1.0	1.0	10000.0	7.62	0.
2700.	17.62	6	1.0	1.0	10000.0	7.62	0.
2800.	16.76	6	1.0	1.0	10000.0	7.62	0.
2900.	15.97	6	1.0	1.0	10000.0	7.62	0.
3000.	15.25	6	1.0	1.0	10000.0	7.62	0.
3500.	12.48	6	1.0	1.0	10000.0	7.62	0.
4000.	10.46	6	1.0	1.0	10000.0	7.62	0.
4500.	8.956	6	1.0	1.0	10000.0	7.62	0.
5000.	7.795	6	1.0	1.0	10000.0	7.62	0.
5500.	6.868	6	1.0	1.0	10000.0	7.62	0.
6000.	6.113	6	1.0	1.0	10000.0	7.62	0.
6500.	5.492	6	1.0	1.0	10000.0	7.62	0.
7000.	4.974	6	1.0	1.0	10000.0	7.62	0.
7500.	4.549	6	1.0	1.0	10000.0	7.62	0.
8000.	4.186	6	1.0	1.0	10000.0	7.62	0.
8500.	3.871	6	1.0	1.0	10000.0	7.62	0.
9000.	3.596	6	1.0	1.0	10000.0	7.62	0.
9500.	3.354	6	1.0	1.0	10000.0	7.62	0.
10000.	3.139	6	1.0	1.0	10000.0	7.62	0.
15000.	1.859	6	1.0	1.0	10000.0	7.62	0.
20000.	1.314	6	1.0	1.0	10000.0	7.62	0.
25000.	1.005	6	1.0	1.0	10000.0	7.62	0.
30000.	0.8073	6	1.0	1.0	10000.0	7.62	0.
40000.	0.5807	6	1.0	1.0	10000.0	7.62	0.
50000.	0.4501	6	1.0	1.0	10000.0	7.62	0.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

384.	125.5	6	1.0	1.0	10000.0	7.62	16.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	125.5	384.	0.

02/24/25
08:54:49

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

HT

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = POINT
EMISSION RATE (G/S) = 0.126000
STACK HEIGHT (M) = 9.1440
STK INSIDE DIAM (M) = 0.2042
STK EXIT VELOCITY (M/S)= 18.2874
STK GAS EXIT TEMP (K) = 477.5944
AMBIENT AIR TEMP (K) = 293.1500
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = RURAL
BUILDING HEIGHT (M) = 0.0000
MIN HORIZ BLDG DIM (M) = 0.0000
MAX HORIZ BLDG DIM (M) = 0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 0.722 M**4/S**3; MOM. FLUX = 2.140 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.000	1	1.0	1.0	320.0	25.92	1.08	1.01	NO
100.	26.05	2	2.5	2.5	800.0	15.86	19.36	10.78	NO
200.	28.73	3	1.5	1.5	480.0	20.33	23.84	14.39	NO
300.	26.02	4	2.0	2.0	640.0	17.53	22.74	12.33	NO
400.	24.75	4	1.5	1.5	480.0	20.33	29.63	15.60	NO
500.	22.73	4	1.0	1.0	320.0	25.92	36.46	18.91	NO
600.	21.08	4	1.0	1.0	320.0	25.92	42.99	21.75	NO
700.	18.92	4	1.0	1.0	320.0	25.92	49.42	24.51	NO
800.	16.78	4	1.0	1.0	320.0	25.92	55.78	27.21	NO
900.	14.85	4	1.0	1.0	320.0	25.92	62.07	29.85	NO
1000.	13.15	4	1.0	1.0	320.0	25.92	68.30	32.45	NO
1100.	11.78	4	1.0	1.0	320.0	25.92	74.46	34.46	NO

1200.	10.61	4	1.0	1.0	320.0	25.92	80.58	36.41	NO
1300.	10.86	6	1.0	1.0	10000.0	31.27	43.50	17.64	NO
1400.	11.04	6	1.0	1.0	10000.0	31.27	46.48	18.38	NO
1500.	11.12	6	1.0	1.0	10000.0	31.27	49.44	19.11	NO
1600.	11.12	6	1.0	1.0	10000.0	31.27	52.38	19.82	NO
1700.	11.06	6	1.0	1.0	10000.0	31.27	55.30	20.51	NO
1800.	10.95	6	1.0	1.0	10000.0	31.27	58.21	21.20	NO
1900.	10.80	6	1.0	1.0	10000.0	31.27	61.11	21.87	NO
2000.	10.62	6	1.0	1.0	10000.0	31.27	63.99	22.53	NO
2100.	10.38	6	1.0	1.0	10000.0	31.27	66.86	23.09	NO
2200.	10.15	6	1.0	1.0	10000.0	31.27	69.71	23.64	NO
2300.	9.905	6	1.0	1.0	10000.0	31.27	72.55	24.18	NO
2400.	9.665	6	1.0	1.0	10000.0	31.27	75.38	24.71	NO
2500.	9.428	6	1.0	1.0	10000.0	31.27	78.20	25.23	NO
2600.	9.194	6	1.0	1.0	10000.0	31.27	81.01	25.74	NO
2700.	8.965	6	1.0	1.0	10000.0	31.27	83.81	26.24	NO
2800.	8.740	6	1.0	1.0	10000.0	31.27	86.60	26.74	NO
2900.	8.521	6	1.0	1.0	10000.0	31.27	89.37	27.23	NO
3000.	8.309	6	1.0	1.0	10000.0	31.27	92.14	27.71	NO
3500.	7.328	6	1.0	1.0	10000.0	31.27	105.84	29.66	NO
4000.	6.518	6	1.0	1.0	10000.0	31.27	119.34	31.48	NO
4500.	5.844	6	1.0	1.0	10000.0	31.27	132.65	33.18	NO
5000.	5.279	6	1.0	1.0	10000.0	31.27	145.81	34.79	NO
5500.	4.800	6	1.0	1.0	10000.0	31.27	158.82	36.31	NO
6000.	4.390	6	1.0	1.0	10000.0	31.27	171.69	37.77	NO
6500.	4.037	6	1.0	1.0	10000.0	31.27	184.45	39.16	NO
7000.	3.729	6	1.0	1.0	10000.0	31.27	197.09	40.50	NO
7500.	3.465	6	1.0	1.0	10000.0	31.27	209.63	41.65	NO
8000.	3.233	6	1.0	1.0	10000.0	31.27	222.07	42.75	NO
8500.	3.027	6	1.0	1.0	10000.0	31.27	234.42	43.82	NO
9000.	2.843	6	1.0	1.0	10000.0	31.27	246.69	44.85	NO
9500.	2.678	6	1.0	1.0	10000.0	31.27	258.87	45.84	NO
10000.	2.529	6	1.0	1.0	10000.0	31.27	270.98	46.81	NO
15000.	1.592	6	1.0	1.0	10000.0	31.27	388.48	55.25	NO
20000.	1.156	6	1.0	1.0	10000.0	31.27	500.99	60.63	NO
25000.	0.8996	6	1.0	1.0	10000.0	31.27	609.78	65.16	NO
30000.	0.7319	6	1.0	1.0	10000.0	31.27	715.62	69.13	NO
40000.	0.5341	6	1.0	1.0	10000.0	31.27	920.25	74.76	NO
50000.	0.4181	6	1.0	1.0	10000.0	31.27	1117.44	79.44	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

170.	28.89	3	2.0	2.0	640.0	17.53	20.59	12.39	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****

*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	28.89	170.	0.

02/24/25
08:56:18

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

FL1

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = FLARE
EMISSION RATE (G/S) = 0.126000
FLARE STACK HEIGHT (M) = 9.1440
TOT HEAT RLS (CAL/S) = 683616.
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = RURAL
EFF RELEASE HEIGHT (M) = 11.9495
BUILDING HEIGHT (M) = 0.0000
MIN HORIZ BLDG DIM (M) = 0.0000
MAX HORIZ BLDG DIM (M) = 0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 11.335 M**4/S**3; MOM. FLUX = 6.912 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.000	1	1.0	1.0	320.0	142.66	1.53	1.48	NO
100.	0.2263	3	10.0	10.2	3200.0	24.95	12.65	7.75	NO
200.	2.571	3	10.0	10.2	3200.0	24.95	23.87	14.45	NO
300.	2.735	3	8.0	8.1	2560.0	28.20	34.60	20.85	NO
400.	2.440	3	5.0	5.1	1600.0	37.95	45.26	27.47	NO
500.	2.376	4	10.0	10.3	3200.0	24.84	36.33	18.66	NO
600.	2.270	4	8.0	8.2	2560.0	28.06	42.96	21.70	NO
700.	2.093	4	8.0	8.2	2560.0	28.06	49.40	24.47	NO
800.	1.995	4	5.0	5.1	1600.0	37.72	56.06	27.78	NO
900.	1.908	4	5.0	5.1	1600.0	37.72	62.32	30.37	NO
1000.	1.802	4	4.5	4.6	1440.0	40.59	68.62	33.12	NO
1100.	1.695	4	4.5	4.6	1440.0	40.59	74.76	35.09	NO
1200.	1.603	4	4.0	4.1	1280.0	44.16	80.96	37.25	NO
1300.	1.516	4	4.0	4.1	1280.0	44.16	87.01	39.10	NO

1400.	1.443	4	3.5	3.6	1120.0	48.77	93.15	41.22	NO
1500.	1.376	4	3.5	3.6	1120.0	48.77	99.10	42.98	NO
1600.	1.311	4	3.5	3.6	1120.0	48.77	105.02	44.69	NO
1700.	1.258	4	3.0	3.1	960.0	54.90	111.09	46.81	NO
1800.	1.227	5	1.0	1.1	10000.0	77.34	88.96	36.48	NO
1900.	1.276	5	1.0	1.1	10000.0	77.34	93.24	37.42	NO
2000.	1.319	5	1.0	1.1	10000.0	77.34	97.51	38.35	NO
2100.	1.347	5	1.0	1.1	10000.0	77.34	101.76	39.18	NO
2200.	1.370	5	1.0	1.1	10000.0	77.34	105.99	40.00	NO
2300.	1.390	5	1.0	1.1	10000.0	77.34	110.22	40.80	NO
2400.	1.406	5	1.0	1.1	10000.0	77.34	114.43	41.60	NO
2500.	1.418	5	1.0	1.1	10000.0	77.34	118.62	42.38	NO
2600.	1.427	5	1.0	1.1	10000.0	77.34	122.80	43.16	NO
2700.	1.434	5	1.0	1.1	10000.0	77.34	126.97	43.93	NO
2800.	1.438	5	1.0	1.1	10000.0	77.34	131.12	44.68	NO
2900.	1.440	5	1.0	1.1	10000.0	77.34	135.26	45.43	NO
3000.	1.440	5	1.0	1.1	10000.0	77.34	139.39	46.17	NO
3500.	1.415	5	1.0	1.1	10000.0	77.34	159.85	49.75	NO
4000.	1.434	6	1.0	1.1	10000.0	65.57	120.15	34.43	NO
4500.	1.441	6	1.0	1.1	10000.0	65.57	133.38	36.00	NO
5000.	1.434	6	1.0	1.1	10000.0	65.57	146.47	37.48	NO
5500.	1.416	6	1.0	1.1	10000.0	65.57	159.43	38.90	NO
6000.	1.392	6	1.0	1.1	10000.0	65.57	172.26	40.26	NO
6500.	1.363	6	1.0	1.1	10000.0	65.57	184.98	41.57	NO
7000.	1.331	6	1.0	1.1	10000.0	65.57	197.59	42.83	NO
7500.	1.293	6	1.0	1.1	10000.0	65.57	210.10	43.92	NO
8000.	1.255	6	1.0	1.1	10000.0	65.57	222.51	44.97	NO
8500.	1.218	6	1.0	1.1	10000.0	65.57	234.84	45.99	NO
9000.	1.182	6	1.0	1.1	10000.0	65.57	247.08	46.97	NO
9500.	1.148	6	1.0	1.1	10000.0	65.57	259.25	47.92	NO
10000.	1.114	6	1.0	1.1	10000.0	65.57	271.34	48.85	NO
15000.	0.8467	6	1.0	1.1	10000.0	65.57	388.73	56.98	NO
20000.	0.6692	6	1.0	1.1	10000.0	65.57	501.18	62.21	NO
25000.	0.5513	6	1.0	1.1	10000.0	65.57	609.94	66.64	NO
30000.	0.4676	6	1.0	1.1	10000.0	65.57	715.75	70.52	NO
40000.	0.3583	6	1.0	1.1	10000.0	65.57	920.35	76.05	NO
50000.	0.2899	6	1.0	1.1	10000.0	65.57	1117.53	80.66	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

248.	2.803	3	10.0	10.2	3200.0	24.95	29.13	17.54	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	2.803	248.	0.

02/24/25
08:58:33

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

FL2

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = FLARE
EMISSION RATE (G/S) = 0.126000
FLARE STACK HEIGHT (M) = 9.1440
TOT HEAT RLS (CAL/S) = 0.940755E+07
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = RURAL
EFF RELEASE HEIGHT (M) = 18.9680
BUILDING HEIGHT (M) = 0.0000
MIN HORIZ BLDG DIM (M) = 0.0000
MAX HORIZ BLDG DIM (M) = 0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 155.980 M**4/S**3; MOM. FLUX = 95.114 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.000	1	1.0	1.0	785.9	784.92	3.47	3.45	NO
100.	0.7554E-02	5	1.0	1.3	10000.0	167.45	42.81	42.52	NO
200.	0.8296E-02	5	1.0	1.3	10000.0	167.45	43.99	42.88	NO
300.	0.9187E-02	5	1.0	1.3	10000.0	167.45	45.66	43.31	NO
400.	0.2049E-01	4	20.0	22.0	6400.0	52.95	30.07	16.43	NO
500.	0.6577E-01	4	20.0	22.0	6400.0	52.95	36.83	19.61	NO
600.	0.1332	1	3.0	3.1	960.0	274.29	144.11	163.74	NO
700.	0.1677	4	20.0	22.0	6400.0	52.95	49.97	25.60	NO
800.	0.2011	4	20.0	22.0	6400.0	52.95	56.40	28.46	NO
900.	0.2211	4	20.0	22.0	6400.0	52.95	62.75	31.25	NO
1000.	0.2286	4	20.0	22.0	6400.0	52.95	68.92	33.73	NO
1100.	0.2262	4	20.0	22.0	6400.0	52.95	75.03	35.67	NO
1200.	0.2214	4	20.0	22.0	6400.0	52.95	81.11	37.56	NO
1300.	0.2151	4	20.0	22.0	6400.0	52.95	87.14	39.40	NO

1400.	0.2079	4	20.0	22.0	6400.0	52.95	93.13	41.19	NO
1500.	0.2002	4	20.0	22.0	6400.0	52.95	99.09	42.95	NO
1600.	0.1924	4	20.0	22.0	6400.0	52.95	105.01	44.66	NO
1700.	0.1846	4	20.0	22.0	6400.0	52.95	110.89	46.35	NO
1800.	0.1769	4	20.0	22.0	6400.0	52.95	116.75	48.00	NO
1900.	0.1695	4	20.0	22.0	6400.0	52.95	122.57	49.62	NO
2000.	0.1624	4	20.0	22.0	6400.0	52.95	128.37	51.22	NO
2100.	0.1568	4	15.0	16.5	4800.0	66.31	134.44	53.58	NO
2200.	0.1525	4	15.0	16.5	4800.0	66.31	140.17	55.10	NO
2300.	0.1481	4	15.0	16.5	4800.0	66.31	145.87	56.60	NO
2400.	0.1438	4	15.0	16.5	4800.0	66.31	151.55	58.08	NO
2500.	0.1396	4	15.0	16.5	4800.0	66.31	157.20	59.54	NO
2600.	0.1354	4	15.0	16.5	4800.0	66.31	162.84	60.98	NO
2700.	0.1314	4	15.0	16.5	4800.0	66.31	168.45	62.40	NO
2800.	0.1275	4	15.0	16.5	4800.0	66.31	174.04	63.81	NO
2900.	0.1237	4	15.0	16.5	4800.0	66.31	179.61	65.20	NO
3000.	0.1204	2	1.5	1.6	530.6	529.60	434.45	392.90	NO
3500.	0.1166	2	1.5	1.6	530.6	529.60	491.00	456.00	NO
4000.	0.1105	5	2.5	3.1	10000.0	128.37	181.77	58.77	NO
4500.	0.1167	5	2.0	2.5	10000.0	136.82	201.91	62.64	NO
5000.	0.1221	5	2.0	2.5	10000.0	136.82	221.44	65.09	NO
5500.	0.1274	5	1.5	1.9	10000.0	148.68	241.28	69.21	NO
6000.	0.1318	5	1.5	1.9	10000.0	148.68	260.42	71.45	NO
6500.	0.1360	5	1.0	1.3	10000.0	167.45	280.17	76.45	NO
7000.	0.1403	5	1.0	1.3	10000.0	167.45	298.96	78.49	NO
7500.	0.1439	5	1.0	1.3	10000.0	167.45	317.62	80.47	NO
8000.	0.1468	5	1.0	1.3	10000.0	167.45	336.16	82.40	NO
8500.	0.1491	5	1.0	1.3	10000.0	167.45	354.57	84.29	NO
9000.	0.1509	5	1.0	1.3	10000.0	167.45	372.86	86.14	NO
9500.	0.1522	5	1.0	1.3	10000.0	167.45	391.05	87.96	NO
10000.	0.1531	5	1.0	1.3	10000.0	167.45	409.13	89.73	NO
15000.	0.1454	5	1.0	1.3	10000.0	167.45	584.93	104.55	NO
20000.	0.1309	5	1.0	1.3	10000.0	167.45	753.52	117.25	NO
25000.	0.1149	5	1.0	1.3	10000.0	167.45	916.64	126.22	NO
30000.	0.1039	6	1.0	1.4	10000.0	137.03	716.38	76.66	NO
40000.	0.9198E-01	6	1.0	1.4	10000.0	137.03	920.84	81.77	NO
50000.	0.8254E-01	6	1.0	1.4	10000.0	137.03	1117.93	86.08	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

1000.	0.2286	4	20.0	22.0	6400.0	52.95	68.92	33.73	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

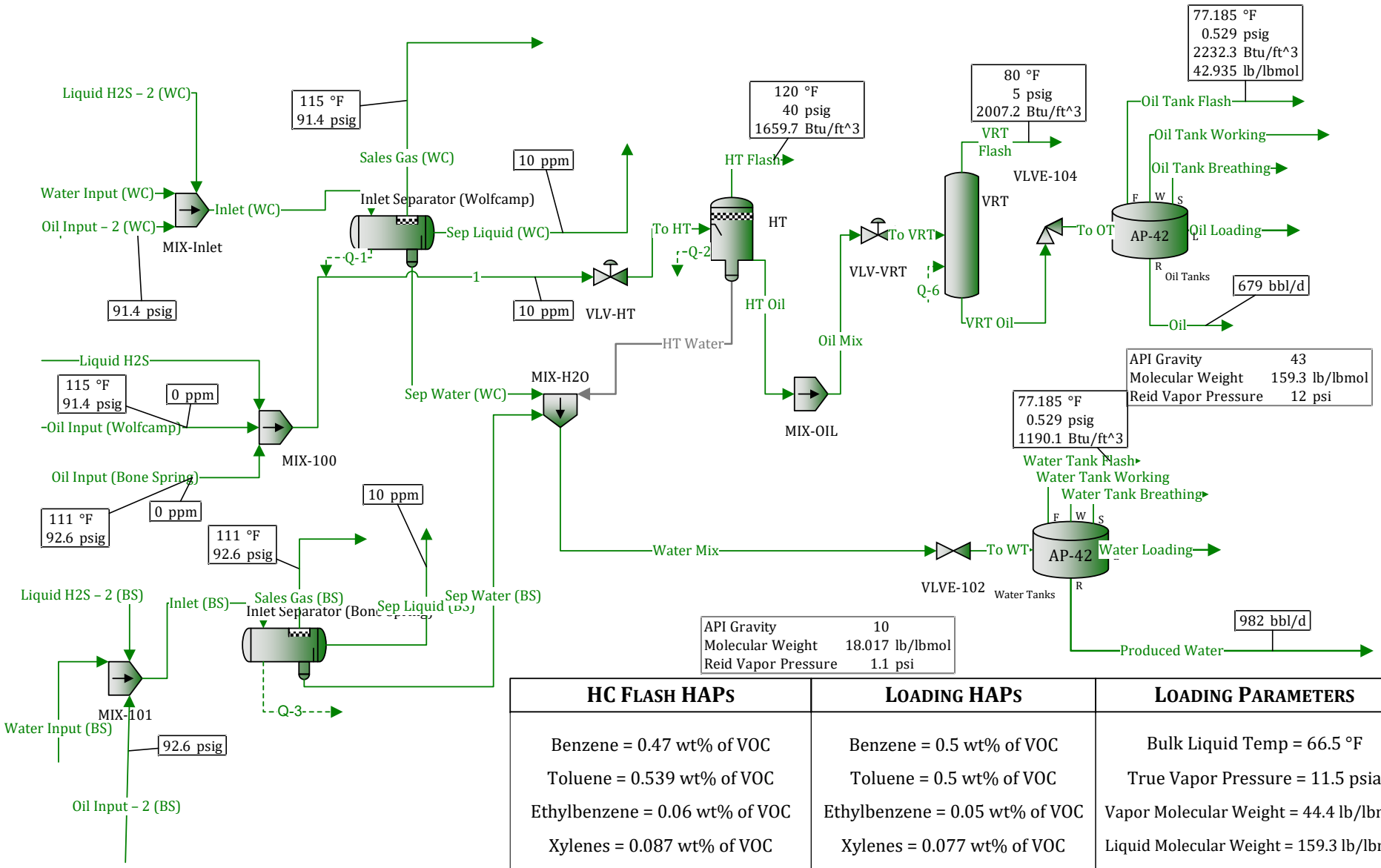
****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	0.2286	1000.	0.

Continental Resources

FACILITY: WHISKEY RIVER N SEC 59 TANK BATTERY

LIQUID SAMPLES: STATE MUDSLINGER 8685E 8608H & STATE MUDSLINGER 8685B 8605H



HC Flash HAPs	Loading HAPs	Loading Parameters
Benzene = 0.47 wt% of VOC	Benzene = 0.5 wt% of VOC	Bulk Liquid Temp = 66.5 °F
Toluene = 0.539 wt% of VOC	Toluene = 0.5 wt% of VOC	True Vapor Pressure = 11.5 psia
Ethylbenzene = 0.06 wt% of VOC	Ethylbenzene = 0.05 wt% of VOC	Vapor Molecular Weight = 44.4 lb/lbmol
Xylenes = 0.087 wt% of VOC	Xylenes = 0.077 wt% of VOC	Liquid Molecular Weight = 159.3 lb/lbmol
n-Hexane = 2.32 wt% of VOC	n-Hexane = 2.2 wt% of VOC	Liquid Density = 6.7 lb/gal

*GOR is the total flash volume from all vessels per barrel of stock tank oil.
**Flash Factors are the pounds of VOC emissions per barrel of stock tank oil/stock tank water.
***Volume Factors are the total flash volume per barrel of stock tank oil/stock tank water.

LAST EDIT: 2/20/2025

Certificate of Analysis

Number: 5030-23060639-006A

Midland Laboratory
2200 East I-20
Midland, TX 79706
Phone 432-689-7252

Adam DeLaney
Continental Resources
20 N. Broadway
Oklahoma City, OK 73102

July 13, 2023

Station Name: STATE MUDSLINGER 8685B 8605H
Sample Point: SEPARATOR
Cylinder No: 5030-08684
Analyzed: 06/29/2023 09:06:23 by CDW

Sampled By: JJ
Sample Of: Gas Spot
Sample Date: 06/23/2023 09:19
Sample Conditions: 91.4 psig, @ 114.6 °F
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia		
Nitrogen	1.0802	1.3100		GPM TOTAL C2+	6.940
Methane	73.8337	51.2730		GPM TOTAL C3+	3.986
Carbon Dioxide	1.1043	2.1040		GPM TOTAL iC5+	1.020
Ethane	11.0271	14.3530	2.954		
Propane	6.8797	13.1320	1.899		
Iso-butane	0.8766	2.2060	0.287		
n-Butane	2.4704	6.2160	0.780		
Iso-pentane	0.7172	2.2400	0.263		
n-Pentane	0.7061	2.2050	0.256		
Hexanes Plus	1.2447	4.8720	0.501		
	99.9400	99.9110	6.940		

Calculated Physical Properties	Total	C6+
Relative Density Real Gas	0.8008	3.1203
Calculated Molecular Weight	23.10	90.37
Compressibility Factor	0.9957	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Real Gas Dry BTU	1347	4864
Water Sat. Gas Base BTU	1323	4779

Data reviewed by: Raymond Bradford, Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Certificate of Analysis

Number: 5030-23060639-006A

Midland Laboratory
2200 East I-20
Midland, TX 79706
Phone 432-689-7252

Adam DeLaney
Continental Resources
20 N. Broadway
Oklahoma City, OK 73102

July 13, 2023

Station Name: STATE MUDSLINGER 8685B 8605H
Sample Point: SEPARATOR
Cylinder No: 5030-08684
Analyzed: 06/29/2023 09:06:23 by CDW

Sampled By: JJ
Sample Of: Gas Spot
Sample Date: 06/23/2023 09:19
Sample Conditions: 91.4 psig, @ 114.6 °F
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Nitrogen	1.0802	1.3100	
Methane	73.8337	51.2730	
Carbon Dioxide	1.1043	2.1040	
Ethane	11.0271	14.3530	2.954
Propane	6.8797	13.1320	1.899
Iso-Butane	0.8766	2.2060	0.287
n-Butane	2.4704	6.2160	0.780
Iso-Pentane	0.7172	2.2400	0.263
n-Pentane	0.7061	2.2050	0.256
Hexanes	0.5806	2.1390	0.235
Heptanes Plus	0.6641	2.7330	0.266
	99.9400	99.9110	6.940

GPM TOTAL C2+	6.9400
GPM TOTAL C3+	3.9860
GPM TOTAL iC5+	1.0200

Calculated Physical Properties	Total	C7+
Relative Density Real Gas	0.8008	3.2806
Calculated Molecular Weight	23.10	95.01
Compressibility Factor	0.9957	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Real Gas Dry BTU	1346.8	5022.6
Water Sat. Gas Base BTU	1323.3	4935.0

Data reviewed by: Raymond Bradford, Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Certificate of Analysis

Number: 5030-23060639-006A

Midland Laboratory
2200 East I-20
Midland, TX 79706
Phone 432-689-7252

Adam DeLaney
Continental Resources
20 N. Broadway
Oklahoma City, OK 73102

July 13, 2023

Station Name: STATE MUDSLINGER 8685B 8605H
Sample Point: SEPARATOR
Cylinder No: 5030-08684
Analyzed: 06/29/2023 09:06:23 by CDW

Sampled By: JJ
Sample Of: Gas Spot
Sample Date: 06/23/2023 09:19
Sample Conditions: 91.4 psig, @ 114.6 °F
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Nitrogen	1.0802	1.310	
Methane	73.8337	51.273	
Carbon Dioxide	1.1043	2.104	
Ethane	11.0271	14.353	2.954
Propane	6.8797	13.132	1.899
Iso-Butane	0.8766	2.206	0.287
n-Butane	2.4704	6.216	0.780
Iso-Pentane	0.7172	2.240	0.263
n-Pentane	0.7061	2.205	0.256
i-Hexanes	0.3702	1.354	0.148
n-Hexane	0.2104	0.785	0.087
Benzene	0.0486	0.164	0.014
Cyclohexane	0.1077	0.392	0.037
i-Heptanes	0.2246	0.903	0.091
n-Heptane	0.0572	0.248	0.026
Toluene	0.0502	0.200	0.017
i-Octanes	0.1239	0.563	0.055
n-Octane	0.0134	0.066	0.007
Ethylbenzene	0.0048	0.022	0.002
Xylenes	0.0083	0.037	0.003
i-Nonanes	0.0170	0.092	0.009
n-Nonane	0.0027	0.015	0.002
Decane Plus	0.0057	0.031	0.003
	99.9400	99.911	6.940

GPM TOTAL C2+ 6.940

Calculated Physical Properties	Total	C10+
Relative Density Real Gas	0.8008	4.3953
Calculated Molecular Weight	23.10	127.30
Compressibility Factor	0.9957	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Real Gas Dry BTU	1346.8	6635.5
Water Sat. Gas Base BTU	1323.3	6491.4

Data reviewed by: Raymond Bradford, Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Certificate of Analysis

Number: 5030-23060639-004A

Midland Laboratory
2200 East I-20
Midland, TX 79706
Phone 432-689-7252

Adam DeLaney
Continental Resources
20 N. Broadway
Oklahoma City, OK 73102

July 13, 2023

Station Name: STATE MUDSLINGER 8685B 8605H
Sample Point: SEPARATOR
Cylinder No: 5030-00836
Analyzed: 06/28/2023 10:43:39 by DMA

Sampled By: JJ
Sample Of: Oil Spot
Sample Date: 06/23/2023 08:35
Sample Conditions: 92.6 psig, @ 111.2 °F
Method: GPA 2103M

Analytical Data

Components	Mol. %	MW	Wt. %	Sp. Gravity	L.V. %
Nitrogen	0.092	28.013	0.016	0.8069	0.016
Methane	2.399	16.043	0.240	0.3000	0.650
Carbon Dioxide	0.109	44.010	0.030	0.8172	0.030
Ethane	2.101	30.069	0.394	0.3563	0.899
Propane	4.345	44.096	1.195	0.5072	1.915
Iso-Butane	1.175	58.122	0.426	0.5628	0.615
n-Butane	4.566	58.122	1.655	0.5842	2.303
Iso-Pentane	2.620	72.149	1.179	0.6251	1.533
n-Pentane	3.351	72.149	1.508	0.6307	1.943
i-Hexanes	4.467	86.175	2.401	0.6641	2.939
n-Hexane	3.500	86.175	1.881	0.6641	2.302
2,2,4-Trimethylpentane	0.051	114.229	0.036	0.6964	0.042
Benzene	0.681	78.112	0.332	0.8844	0.305
Heptanes	7.945	100.202	4.965	0.6882	5.863
Toluene	2.640	92.138	1.517	0.8719	1.414
Octanes	8.710	114.229	6.205	0.7066	7.138
Ethylbenzene	0.684	106.165	0.453	0.8716	0.422
Xylenes	1.592	106.167	1.054	0.8761	0.978
Nonanes	5.122	128.255	4.097	0.7222	4.611
Decanes Plus	43.850	257.479	70.416	0.8931	64.082
	100.000		100.000		100.000

Calculated Physical Properties	Total	C10+
Specific Gravity at 60°F	0.8128	0.8931
API Gravity at 60°F	42.597	26.937
Molecular Weight	160.340	257.479
Pounds per Gallon (in Vacuum)	6.776	7.446
Pounds per Gallon (in Air)	6.769	7.438
Cu. Ft. Vapor per Gallon @ 14.696 psia	16.038	10.974

Data reviewed by: Raymond Bradford, Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Midland Laboratory
2200 East I-20
Midland, TX 79706
Phone 432-413-8747

CERTIFICATE OF ANALYSIS
23060639-004A

Customer:	Continental Resources	**Report Date:**	07/13/23
Attn:	Adam Delaney		
	20 N. Broadway	**PO / Ref. No.:**	
	Oklahome City, OK 73102		

Company:	Continental Resources	**Sample Of:**	Oil
Field:		**Sample Date/Time:**	6/23/2023
Well :	State Mudslinger 8685B 8605H	**Sample Psig & Temp:**	138.6 psia @ 111.2 ºF
		Sampled By:	JJ
Sample Point:	Separator	**Cylinder # :**	5030-00836

Comments: *Please note, sample was forced into a single phase by raising pressure to vapor pressure value. Original value 107.3 psia

Analytical Data

Parameters	Results	Units	Method	Lab Tech.	Date Analyzed
Stage 1:					
Staged Flash from 138.6 psia @ 111.2°F to 14.7 psia @ 72°F					
Shrinkage Factor	0.9696				
Flash Factor	51.922	Cu.Ft./STBbl.	Shrink-EOS		07/13/23
Vapor (Bubble Point)	138.57	psia	VP-EOS		07/13/23

Midland Laboratory
2200 East I-20
Midland, TX 79706
Phone 432-413-8747

CERTIFICATE OF ANALYSIS
23060639-004A

Customer:	Continental Resources	**Report Date:**	07/13/23
Attn:	Adam Delaney		
	20 N. Broadway	**PO / Ref. No.:**	
	Oklahome City, OK 73102		
Company:	Continental Resources	**Sample Of:**	Oil
Field:		**Sample Date/Time:**	06/23/23
Well:	State Mudslinger 8685B 8605H	**Sample Psig & Temp:**	138.6 psia @ 111.2 °F
		Sampled By:	JJ
Sample Point:	Separator	**Cylinder # :**	5030-00836
Comments:	EOS Flash Gas Composition		

Staged Flash from 138.6 psia @ 111.2°F to 14.7 psia @ 72°F

	MOL %	WEIGHT %	GPM's @ 14.696
NITROGEN	1.225	0.928	
METHANE	30.665	13.297	
CO2	1.239	1.473	
ETHANE	20.845	16.942	5.629
PROPANE	24.741	29.488	6.883
I-BUTANE	3.531	5.547	1.167
N-BUTANE	9.941	15.618	3.165
I-PENTANE	2.408	4.696	0.889
N-PENTANE	2.359	4.601	0.864
I-HEXANE	1.334	3.108	0.554
N-HEXANE	0.718	1.672	0.298
2,2,4 TRIMETHYLPENTANE	0.004	0.012	0.002
BENZENE	0.117	0.247	0.033
HEPTANES	0.509	1.329	0.237
TOLUENE	0.125	0.311	0.042
OCTANES	0.178	0.538	0.092
E-BENZENE	0.011	0.030	0.004
m,o,&p-XYLENE	0.018	0.051	0.007
NONANES	0.033	0.114	0.019
DECANES PLUS	0.000	0.000	0.000
TOTALS	100.000	100.000	19.885

CALCULATED VALUES

CALCULATED MOLECULAR WEIGHT TOTAL	37.019
REAL, DRY BTU AT 14.696 PSIA, 60 DEG.F	2107.5
REAL, WET BTU AT 14.696 PSIA, 60 DEG.F	2070.7
REAL, RELATIVE DENSITY	1.2935
COMPRESSIBILITY FACTOR	0.98776

	C2+	C5+
REAL, GPM's @ 14.696 psia, 60 Deg.F	19.885	3.041

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CERTIFICATE OF ANALYSIS
23060639-004A

Customer:	Continental Resources	**Report Date:**	07/13/23
Attn:	Adam Delaney		
	20 N. Broadway	**PO / Ref. No.:**	
	Oklahome City, OK 73102		
Company:	Continental Resources	**Sample Of:**	Oil
Field:		**Sample Date/Time:**	6/23/23
Well:	State Mudslinger 8685B 8605H	**Sample Psig & Temp:**	138.6 psia @ 111.2 ºF
		Sampled By:	JJ
Sample Point:	Separator	**Cylinder # :**	5030-00836
Comments:	EOS Liquid Residue Composition		

Staged Flash from 138.6 psia @ 111.2°F to 14.7 psia @ 72°F

	MOL %	WEIGHT %	L V %
NITROGEN	0.001	0.000	0.000
METHANE	0.136	0.013	0.035
CO2	0.019	0.005	0.005
ETHANE	0.600	0.106	0.246
PROPANE	2.712	0.705	1.145
I-BUTANE	0.986	0.338	0.495
N-BUTANE	4.136	1.417	1.999
I-PENTANE	2.637	1.122	1.478
N-PENTANE	3.430	1.459	1.906
I-HEXANE	4.718	2.397	2.973
N-HEXANE	3.723	1.891	2.347
2,2,4 TRIMETHYLPENTANE	0.055	0.037	0.044
BENZENE	0.726	0.334	0.312
HEPTANES	8.540	4.866	5.826
TOLUENE	2.841	1.543	1.459
OCTANES	9.393	6.211	7.244
E-BENZENE	0.738	0.462	0.437
m,o,&p-XYLENE	1.718	1.075	1.015
NONANES	5.529	4.131	4.713
DECANES PLUS	47.361	71.887	66.323
TOTALS	100.000	100.000	100.000

CALCULATED VALUES	TOTAL	C10+
Molecular Weight	170.213	257.479
BTU / Lb.	20,494	20,452
BTU / Gal.	140,786	152,287
Cu. Ft. / Gal. At 14.696 Psia, 60°F	15.316	10.974
Lbs. / Gal. (Absolute Density)	6.870	7.446
Lbs. / Gal. (Weight in Air)	6.861	7.437
Specific Gravity at 60°F (Water = 1)	0.8240	0.8931
API Gravity at 60°F	40.2	26.9

Certificate of Analysis

Number: 5030-23060639-002A

Midland Laboratory
2200 East I-20
Midland, TX 79706
Phone 432-689-7252

Adam DeLaney
Continental Resources
20 N. Broadway
Oklahoma City, OK 73102

July 13, 2023

Station Name: STATE MUDSLINGER 8685B 8605H
Sample Point: SEPARATOR
Sample Conditions: 92.6 psig, @ 111.2 °F

Sampled By: JJ
Sample Of: Oil Spot
Sample Date: 06/23/2023 08:35

Analytical Data

Test	Method	Result	Units	Detection Limit	Lab Tech.	Analysis Date
API Gravity @ 60° F	ASTM D-5002	41.94	°		JAS	06/29/2023
Specific Gravity @ 60/60° F	ASTM D-5002	0.8158			JAS	06/29/2023
Density @ 60° F	ASTM D-5002	0.8150	g/ml		JAS	06/29/2023
ASTM D323 RVPE @ 100° F	ASTM D-6377	7.47	psi		MGN	06/29/2023
VP of Crude Oil: V/L = 4:1 @ 100 °F	ASTM D-6377	8.16	psi		MGN	06/29/2023
Hydrogen Sulfide	UOP-163	<5	ppmw		JAS	06/29/2023
Mercaptans	UOP-163	213.41	ppmw		JAS	06/29/2023

Data reviewed by: Raymond Bradford, Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Certificate of Analysis

Number: 5030-23060639-005A

Midland Laboratory
2200 East I-20
Midland, TX 79706
Phone 432-689-7252

Adam DeLaney
Continental Resources
20 N. Broadway
Oklahoma City, OK 73102

July 13, 2023

Station Name: STATE MUDSLINGER 8685E 8608H
Sample Point: SEPARATOR
Cylinder No: 1111-003947
Analyzed: 06/29/2023 09:06:23 by CDW

Sampled By: Ronnie Richard - SPL
Sample Of: Gas Spot
Sample Date: 06/23/2023 08:49
Sample Conditions: 104.3 psig, @ 108.0 °F
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Hydrogen Sulfide	0.0003	0.0000	
Nitrogen	1.1163	1.2210	
Methane	69.9352	43.7930	
Carbon Dioxide	0.5281	0.9070	
Ethane	11.2822	13.2420	3.026
Propane	7.5031	12.9140	2.073
Iso-butane	0.9246	2.0980	0.303
n-Butane	2.8973	6.5730	0.916
Iso-pentane	0.9216	2.5950	0.338
n-Pentane	1.0276	2.8940	0.374
Hexanes Plus	3.8637	13.7630	1.562
	100.0000	100.0000	8.592

GPM TOTAL C2+	8.592
GPM TOTAL C3+	5.566
GPM TOTAL iC5+	2.274

Calculated Physical Properties	Total	C6+
Relative Density Real Gas	0.8892	3.1521
Calculated Molecular Weight	25.62	91.29
Compressibility Factor	0.9945	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Real Gas Dry BTU	1495	4907
Water Sat. Gas Base BTU	1469	4821

Comments: H2S Field Content 2.5 ppm

Data reviewed by: Raymond Bradford, Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Certificate of Analysis

Number: 5030-23060639-005A

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Midland, TX 79706
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Adam DeLaney
Continental Resources
20 N. Broadway
Oklahoma City, OK 73102

July 13, 2023

Station Name: STATE MUDSLINGER 8685E 8608H
Sample Point: SEPARATOR
Cylinder No: 1111-003947
Analyzed: 06/29/2023 09:06:23 by CDW

Sampled By: Ronnie Richard - SPL
Sample Of: Gas Spot
Sample Date: 06/23/2023 08:49
Sample Conditions: 104.3 psig, @ 108.0 °F
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Hydrogen Sulfide	0.0003	0.0000	
Nitrogen	1.1163	1.2210	
Methane	69.9352	43.7930	
Carbon Dioxide	0.5281	0.9070	
Ethane	11.2822	13.2420	3.026
Propane	7.5031	12.9140	2.073
Iso-Butane	0.9246	2.0980	0.303
n-Butane	2.8973	6.5730	0.916
Iso-Pentane	0.9216	2.5950	0.338
n-Pentane	1.0276	2.8940	0.374
Hexanes	1.6544	5.4940	0.671
Heptanes Plus	2.2093	8.2690	0.891
	100.0000	100.0000	8.592

GPM TOTAL C2+	8.5920
GPM TOTAL C3+	5.5660
GPM TOTAL iC5+	2.2740

Calculated Physical Properties	**Total**	**C7+**
Relative Density Real Gas	0.8892	3.3128
Calculated Molecular Weight	25.62	95.95
Compressibility Factor	0.9945	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Real Gas Dry BTU	1495.3	5073.8
Water Sat. Gas Base BTU	1469.2	4985.3

Comments: H2S Field Content 2.5 ppm

Data reviewed by: Raymond Bradford, Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Certificate of Analysis

Number: 5030-23060639-005A

Midland Laboratory
2200 East I-20
Midland, TX 79706
Phone 432-689-7252

Adam DeLaney
Continental Resources
20 N. Broadway
Oklahoma City, OK 73102

July 13, 2023

Station Name: STATE MUDSLINGER 8685E 8608H
Sample Point: SEPARATOR
Cylinder No: 1111-003947
Analyzed: 06/29/2023 09:06:23 by CDW

Sampled By: Ronnie Richard - SPL
Sample Of: Gas Spot
Sample Date: 06/23/2023 08:49
Sample Conditions: 104.3 psig, @ 108.0 °F
Method: GPA 2286

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.696 psia
Hydrogen Sulfide	0.0003	0.000	
Nitrogen	1.1163	1.221	
Methane	69.9352	43.793	
Carbon Dioxide	0.5281	0.907	
Ethane	11.2822	13.242	3.026
Propane	7.5031	12.914	2.073
Iso-Butane	0.9246	2.098	0.303
n-Butane	2.8973	6.573	0.916
Iso-Pentane	0.9216	2.595	0.338
n-Pentane	1.0276	2.894	0.374
i-Hexanes	1.0571	3.486	0.424
n-Hexane	0.5973	2.008	0.247
Benzene	0.1646	0.502	0.046
Cyclohexane	0.2993	0.984	0.102
i-Heptanes	0.7379	2.691	0.302
n-Heptane	0.2016	0.788	0.093
Toluene	0.1755	0.631	0.059
i-Octanes	0.4376	1.804	0.196
n-Octane	0.0582	0.260	0.030
Ethylbenzene	0.0180	0.075	0.007
Xylenes	0.0254	0.106	0.010
i-Nonanes	0.0703	0.326	0.035
n-Nonane	0.0067	0.033	0.004
Decane Plus	0.0142	0.069	0.007
	100.0000	100.000	8.592

GPM TOTAL C2+ 8.592

Calculated Physical Properties	Total	C10+
Relative Density Real Gas	0.8892	4.3813
Calculated Molecular Weight	25.62	126.89
Compressibility Factor	0.9945	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.696 psia & 60°F		
Real Gas Dry BTU	1495.3	6627.0
Water Sat. Gas Base BTU	1469.2	6475.3

Comments: H2S Field Content 2.5 ppm

Data reviewed by: Raymond Bradford, Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.